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The Cost of Committing ESG-related Sin

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Abstract

We investigate whether and how exclusions by the Norwegian Government Pension Fund Global (NGPF-G), the world's largest sovereign wealth fund (SWF), affect the excluded firms' cost of equity capital. We find that exclusions by the NGPF-G are priced and are associated with a higher cost of equity compared to a matched sample of firms that are still in the SWF's portfolio as well as firms from the same country as the excluded firm. Norm-based exclusions elicit a greater increase in the cost of equity than sector-based exclusions. Also, the effect is stronger for firms that were recently excluded from the NGPF-G portfolio than for those excluded earlier. We identify illiquidity as the main channel through which the exclusions affect firms' cost of equity capital. Excluded firms experience a significant decrease in institutional holdings and fewer analysts cover them. These changes lead to higher illiquidity, which affects the cost of equity capital. The higher cost of capital leads to a decrease in firm value after the exclusion. Further analysis shows that the drop in firm value is caused in part by the increase in the cost of equity; thus, being dropped from the NGPF-G portfolio due to ESG concerns bodes ill for the excluded firms.

JEL Classification: G11, G23, G32, M14

Keywords: Exclusions, Cost of equity, Norm-constrained investors, Sovereign wealth fund

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The Cost of Committing ESG-related Sin

1. Introduction

Since the publication of Friedman's seminal paper on profit maximisation, firms around the world have strongly focused on the narrow objective of enhancing corporate profit. Friedman (1970) was so fixated on promoting profits that he even suggested disregarding ethical concern and legal requirements on businesses to treat workers, consumers and society fairly (Mayer et al., 2020). As a consequence, firms are becoming increasingly predatory and moving far away from their moral responsibilities, such as employee welfare. Furthermore, Mayer et al. (2020) state that the unidimensional corporate focus on profit has severe negative effects on nature and biodiversity and contributes to global warming. In fact, both the business and academic worlds have long advocated for the integration of ethics in business to prevent corporate unethical behaviour (Lewin 1983). In this regard, O'Neil and Pienta (1994) argued that, although profit might be important as an end means of business, it should be moderated by ethical considerations.

Ethical business philosophy helps us redefine corporate responsibility, in which firms are expected to tackle major social challenges societies face today (Spiller, 2000). A particular focus of ethical business is said to be addressing environmental and social issues in addition to financial performance (ibid). In this context, Dawkins (2016) states that firms should engage more with socially responsible investments which integrate environmental, social and governance (ESG) criteria, as this reflects ethical corporate behaviour. Investors and fund managers can promote ethical business practices by encouraging ESG investment in portfolio companies, either by best-of-class engagement or by divestment (Dawkins, 2016). While best-of-class strategy as a relativist approach might work better by setting standards to follow and engaging with lagging firms, divestment, as an absolute strategy, works better for critical issues, and is often considered to be more ethical.

Divestment is considered an ethical practice primarily because it is viewed as an absolute moral commitment to socially responsible investing (SRI), particularly when addressing issues that many deem unacceptable, such as climate change (Dawkins, 2016). This perspective is often rooted in Kantian ethics, where divestment represents a categorical imperative – an unconditional moral duty – to uphold inviolable ethical standards, independent of self-interest or consequences (Guisande et al., 2024). One of the strongest moral arguments for divestment is based on the duty not to cause harm to anybody. By holding shares in fossil fuel companies or those involved in unethical practices, institutions are seen as complicit in the harm caused to others by being part of the causal chain leading to negative outcomes like climate change. Divestment removes this complicity (Moss, 2017). For many institutions, divestment is explicitly defined by moral absolutes, such as breaches of international conventions, norms and codes related to human rights, severe environmental damage, or gross corruption (Dawkins, 2016). The Norwegian Government Pension Fund-Global (NGPF-G),

the world's largest sovereign wealth fund (SWF), with a special focus on environmental and ethical investing, has adopted the latter approach. The NGPF-G, which uses inviolable standards for exclusion, ensuring that ethical principles of their investments are not compromised, has dropped many firms from its portfolio over carbon emission concerns. The Fund's high-profile global status as the world's largest sovereign wealth fund managing over \$1 trillion assets characterized by its pioneering ethical guidelines for investment decisions, has made it a leader in socially responsible investing (SRI). As a result, many institutional investors follow its exclusion decisions (Du, 2016). It is important to note that much of the ability of corporate divestment as an ethical strategy, including affecting corporate behaviour, depends on how divestment can affect the financial health, such as share price, stock return or cost of capital, of the divested company (Hudson, 2005). If divestment is followed by an increase in the cost of capital for the divested firm, this will put pressure on the management to behave ethically to avoid further deterioration of the cost of using external capital. Therefore, it would be interesting to see the consequences of upholding the ethical practice by looking at divested firms' changes in the cost of capital.

Divestment by a high-profile ethical SWF such as NGPF-G provides new information about the excluded firm's status as a bad environmental actor. The exclusion reveals the firm's unethical behaviour to the public, and the fact that the NGPF-G could not work with it to improve the situation and has instead exited in discontent does not bode well for the firm. In this era of sustainable development where consumers are sensitised to environmental, social and unethical behaviours, such naming and shaming actions taken by the largest ethical SWF could hurt the excluded firm's profitability because of possible boycotts and reduced revenue. The exit in discontent could trigger more exodus by other green investors or norm-constrained institutional investors. The cascading effects could bode ill for the excluded firm in terms of reputational damage and the attendant effects on revenue and market value. In addition, divestment for ethical reasons could affect the excluded firm's ability to raise capital in the future. Moreover, the excluded firm's information environment could deteriorate, which in turn could increase its cost of equity.

While corporate social responsibility can affect the perceived riskiness of a firm, and there is evidence that firms with better ESG performance tend to face lower capital constraints (El Ghouli et al., 2011), it is not clear whether divestments by the largest ethical SWF affect the excluded firm's cost of equity capital. On the one hand, divestment by the NGPF-G and the possibility of correlated exclusions by other norm-constrained firms (see Du, 2016) could affect the excluded firm's cost of equity capital through the firm's information environment. Excluded firms will tend to have a smaller investor base, reduced analyst coverage, higher information asymmetry and, consequently, lower liquidity. The capital market equilibrium model of Merton (1987) suggests that a reduction in the size of a firm's investor base will result in a higher cost of equity capital. Hong and Kacperczyk (2009)

also find evidence that firms operating in ‘sin’ industries are less likely to be held by norm-constrained institutions such as pension funds. These firms also receive less coverage from analysts and have higher expected returns. If more norm-constrained investors, including the NGPF-G, exit these firms, analysts and the media will spend less time covering and reporting news about them. The reduction in analyst coverage and investor base of the excluded firms will lead to an increase in information asymmetry and a reduction in liquidity, leading to an increase in equity holders’ required rate of return.

On the other hand, divestment is effective in increasing the cost of equity capital of an unsustainable firm or blocking its access to capital markets mainly in the primary market when the firm attempts to raise fresh capital (Blitz and Swinkels, 2020). Divestment is a secondary market activity which involves the sale of the excluded firm’s shares to other investors. This implies that the aggregate effect of exclusion appears to be zero. This is because other non-norm-constrained institutional investors, such as hedge funds, could opportunistically take advantage of the drop in price caused by the exit of the NGPF-G and other norm-constrained investors to invest in the excluded firm, thus bringing improved liquidity and analyst coverage. Therefore, if the intent of the NGPF-G’s divestment is to ‘punish’ the affected firm for committing environmental and/or social sins, then the expected effects may not materialise.

Moreover, Rose (2008) asserts that SWFs may not always have pure economic interests in their portfolio companies. For example, the NGPF-G promotes environmental and ethical investment in their portfolio companies. The focus on non-economic interests may increase monitoring costs for other investors, which can increase the cost of equity for the portfolio companies. The increase in monitoring costs could explain the significant negative returns experienced by investee firms following sovereign wealth funds’ investment in listed companies (see Fotok et al., 2008). The foregoing discussion suggests that exclusions by SWFs could reduce the agency cost of monitoring, and hence the cost of equity capital of the portfolio companies. Therefore, whether exclusions by the NGPF-G result in an increase in the cost of equity capital of the affected firms is an empirical question that has not been systematically explored, although Ghouma and Ouni (2022a) examine the effects of sovereign wealth funds’ investment on cost of debt.

In this paper, we examine whether exclusion by the NGFP-G for ethical and sustainability reasons is priced by the capital market. We do this by analysing the impact of the exclusions on the affected firms’ equity financing costs relative to that of two distinct control samples consisting of (i) firms that are still in the NGPF-G portfolio and (ii) companies from the excluded firms’ country and industry. We focus on cost of capital because prior research suggests that the cost of capital could be a channel through which capital markets encourage firms to become more socially responsible (Blitz et al., 2020; Heinkel et al., 2001).

We document several interesting results: first, exclusions by the NGPF-G are associated with an increase in the cost of equity financing for the affected firms. Second, the excluded firms from high climate risk awareness countries, including those from the European Union, experience a significant increase in the cost of equity finance compared to those from low awareness countries. Third, the costs of equity capital effects are stronger for firms that were recently excluded from the NGPF-G portfolio after the adoption of the UN's sustainable development goals (SDGs). Fourth, norm-based exclusions (i.e., those involving firms that engaged in unethical business practices) result in greater increases in the cost of equity than sector-based exclusions. The finding is consistent with the argument that companies excluded for engaging in unethical business practices that can be changed by management (norm-based exclusions) are more likely to bear risks that are not correctly priced by the market until after the exclusion. In terms of the reasons for the exclusion, the effects are stronger for exclusions due to coal production (sector-based exclusion) and gross corruption (norm-based). Further analysis indicates that changes in the firm's information environment and liquidity are the main channels through which exclusions affect the cost of capital. Specifically, reduced institutional ownership and less analyst coverage led to lower liquidity and an increase in the cost of equity capital. Consistent with the discounted cash flow model, the increase in cost of equity capital after the exclusion negatively impacted firm value.

The paper contributes to business ethics literature through its empirical investigation into the financial consequences faced by firms that fail to adhere to environmental, social and ethical standards, thereby providing clear evidence regarding the economic cost of irresponsible and unethical corporate behaviour. More specifically, the paper makes several contributions that are worth mentioning. First, there is still a dilemma regarding the social nature of business ethics and the practical significance of business ethics within organisations. While it is important to promote collective issues through adopting ethical business practices, organisations would be more interested to see the visible financial impacts of not adopting ethics in their business (Ma, 2009). In this paper, we have contributed to business ethics literature by looking into the financial implications of firms that are not being ethical in conducting their business. To do this, we have selected divestment by the world's most ethical sovereign wealth fund – NGPF-G (Ayoubi and Enjolras, 2020). The findings document the detrimental effect of noncompliance with ethical investment by portfolio companies, which clearly supports the fact that investors take ethical investing seriously by providing clear evidence regarding the cost of deviating from ESG investment principles. Second, our paper provides substantial evidence on encouraging social responsibility through capital markets. Recent research has focused on the impact of SWF investments on short-term stock returns (Dewenter et al. 2010), firm value (Bortolotti et al. 2015; Fernandes, 2014), cost of debt (Ghouma and Ouni, 2022a), debt maturity (Ghouma and Ouni, 2022b), equity pricing (Boubaker et al. 2018), and monitoring and

agency issues (Borisova et al., 2012). Our study contributes to this line of research by examining the effects of divestment by SWFs on the cost of equity capital of the excluded firms. By showing that exclusions by the world's largest ethical SWF led to an increase in the cost of affected firms' equity capital, the paper demonstrates that capital markets price the violation of ethical norms by portfolio companies once they are made public.

Third, the paper makes an important contribution to the divestment literature by showing that the effects of exclusions depend on the type of ethical violation – norm-based and sector-based violations. We find that both sector-based exclusions and norm-based exclusions affect the cost of equity of portfolio companies, but exclusions relating to norm-based violations (involving unethical business practices that the management can change) lead to a greater increase in the cost of equity capital than exclusions due to sector-based violations (e.g., for producing harmful products). This finding supports the argument that the risks associated with unethical business practices behaviour that remain undisclosed would not be correctly priced by the market until the exclusion takes place. We also find that not all exclusions are priced and that firms that are excluded for producing coal, engaging in corruption, and causing severe environmental damage experience significant increases in their cost of equity financing. In this regard, not only does our study provide granular evidence on the cost of unethical business practice, but it is also the first to document differential effects associated with the type of exclusion (norm-based and sector-based) and the reasons for the exclusion.

The rest of the paper is organised as follows. In section 2, we discuss the theoretical framework, the related empirical studies and the hypotheses. Section 3 describes our sample and methodology. The results are presented in section 4, and robustness tests appear in section 5. Section 6 concludes the paper.

2. Related Literature and Hypotheses

2.1. Literature review

Ethics has long been an integral part of business. One of the greatest philosophers, Aristotle, argued that the economy and ethics are intensely interrelated and that the economy should be subordinated to ethics (Sison et al., 2019). Ethics in business is essential because common goods such as the environment cannot be adequately safeguarded or promoted by a market mechanism, which is often premised solely on the maximisation of profits or the financial calculations of costs and benefits (Sison et al., 2019). Despite these philosophical views about ethics in business and finance, the rise of neoclassical economics has given prominence to profit maximisation. One of the proponents of neoclassical economics, Milton Friedman, argued that profit maximisation should be the only objective of the firm (Friedman, 1970). The neoclassical view of profit maximisation is myopic in nature as it often prioritises short-term financial goals and is less concerned about the broader societal

or environmental consequences (Lestan and Kabiraj, 2025). In contrast, the stakeholder theory embraces the welfare of not just the immediate shareholders but also all the stakeholders who are connected to the firm in different ways and the broader society where the business operates (Valentinov, 2023). Freeman et al. (2010) postulate that most business decisions have some ethical content or an implicit ethical view, and stakeholder theory (ST) is a suitable framework to integrate them.

Stakeholder theory is a crucial framework in business ethics, which explicitly challenges the traditional view that the corporation's sole function is maximising returns for shareholders. It advocates for the maximisation of the benefits of stakeholders, who are defined as any groups or individuals who can affect or are affected by the firm's actions, goals or decisions (Gibson, 2000). The normative approach to stakeholder theory posits that corporations ought to consider stakeholder interests because doing so is a moral requirement (Donaldson and Preston, 1995). However, the ethical norms or principles that corporations should abide by to protect the interests of stakeholders are mostly set in the context of social contract theory, which suggests specific cultural or organisational practices that are considered to be the absolute minimum required (Dawkins, 2016). Similarly, Clarkson (1995) and Donaldson and Preston (1995) state that stakeholder theory promotes organisational ethics in the sense that it emphasises the interests of all the parties related to a firm rather than just the shareholders. The moral basis for stakeholder perspectives has been the principle of common good (Harrison et al., 2015). To ensure the common good principle, stakeholders must focus on environmental sustainability or climate change as it poses a significant challenge to society (Lopez-Cabarcos et al., 2025). Investors and fund managers can promote sustainable or ethical business practices in their portfolio companies through engagement or divestment (Dawkins, 2016). One of the strongest moral arguments for divestment is based on 'negative duty'; that is, the desire not to cause harm to anybody. By holding shares in fossil fuel companies or those involved in unethical practices, institutions are seen as complicit in the harm caused to others. Divestment removes this complicity (Moss, 2017). While divestment has gained currency in the business ethics literature as a moral option to promote ethical investment like ESG, empirical work that examines the effectiveness of divestment in affecting the financial position, in particular the cost of equity capital, of divested firms is limited.

2.2. Hypotheses

2.2.1. Exclusions and cost of capital

The literature on limited stock market participation (e.g., Merton, 1987; Basak and Cuoco, 1998; Shapiro, 2002) posits that only a restricted set of investors participate in trading shares because of the information cost investors must incur to become aware of the firm's prospects. The capital market

equilibrium model of Merton (1987) also suggests that a decrease in a firm's investor base will result in a higher cost of capital. Following divestment by the NGPF-G, the investor base of the excluded firms could reduce because other green investors or norm-constrained institutions, such as pension funds, could also liquidate their investments in the affected firms and will ignore information about them. Thus, consistent with Basak and Cuoco's (1998) equilibrium model of restricted stock market participation, the excluded firms' shares will be held only by neutral, and hence fewer, investors, leading to a reduced potential for risk sharing, decline of liquidity, and an increase in the cost of equity capital (Heinkel et al., 2001; Hong and Kacperczyk, 2009).

In addition, investors could be concerned about the environmental and social profile of the affected firms because exclusion for environmental reasons will affect the firm's perceived risk. As a result, investors' exposure to litigation and reputational risk stemming from their association with polluting and socially irresponsible firms increases. Extant literature also suggests that investors perceive socially irresponsible firms as having a higher level of risk and that these firms could face uncertain future explicit claims (Waddock and Graves, 1997). Investors and lenders may price the risk and consequently expect a higher return on capital as compensation for the potential liability and reputational risk they are compelled to bear (Chava, 2014).

An important question is whether excluded the firm's perceived risks can be diversified away in the investors' portfolio and therefore not priced. Drawing on Merton's model, Hong and Kacperczyk (2009, p. 17) argue that this unique risk matters, because of either neglected risk or limited risk-sharing opportunities. Hence, with a higher level of non-diversifiable risk, low-sustainability firms will face a higher cost of equity capital because they are likely to face greater litigation risk. Indeed, Hong and Kacperczyk (2009) find evidence that firms that operate in 'sin' industries (e.g., alcohol, tobacco, and gambling) have higher expected returns. Other studies including El Ghoul et al. (2011) that examine the relationship between sustainable investing and firms' access to capital find that firms with better ESG performance enjoy lower costs of equity capital.

Based on the findings of Merton (1987), Basak and Cuoco (1998), Heinkel et al. (2001), and Chava (2014), the investor base of the excluded firms will likely reduce after the exclusion because other green investors or norm-constrained institutional investors are also likely to liquidate their holdings in the affected firms. Thus, the excluded firms' shares will mostly be held only by neutral investors, leading to a decline in liquidity. The cost of equity capital will increase if there is a decline in liquidity and analyst coverage. We expect that, *ceteris paribus*, excluded firms will experience a higher cost of equity capital than the control sample. However, the exclusion could also serve as a wake-up call for an excluded firm to rectify its environmental and social problems. The exclusion might therefore signal a shift towards more responsible corporate behaviour (Fich and Shivdasani, 2007), where the affected firm could implement responsible actions subsequent to the exclusion. The

market could respond more favourably to the announcement of exclusion for ethical or environmental violations. As argued by Blitz et al. (2020), some institutional investors use sustainable investing and exclusion as a way to hurt unsustainable firms, thereby giving the affected firms an incentive to improve their corporate behaviour. Given the competing perspectives outlined above, the nature of the effects of exclusions ultimately is an empirical question. We hypothesise that:

H₁: Divestment by the NGPF-G increases the cost of equity capital of excluded firms.

2.2.1. Differential effects

Social norms play a significant role in motivating investors, especially institutions, to use divestment as a primary strategy in socially responsible investing (Cahan et al., 2017; Guisande et al., 2024). Divestment is considered as the absolute moral commitment in socially responsible investments, particularly against activities that are deemed unacceptable (Dawkins, 2017). This influence is strongest for ‘norm-constrained institutions’, such as pension funds, universities, and religious organisations, which face public scrutiny regarding their investments (Cahan et al., 2017; Hong and Kacperczyk, 2009). These institutions adhere to societal norms against the funding of operations that promote vices and this leads them to exclude sin stocks from their portfolios (Hong and Kacperczyk, 2009; Balbaa et al., 2025).

Firms excluded by the NGPF-G fall into one of two categories, those that produce products that are considered to be harmful to society (sector-based exclusions) and those that pursue unethical business practices (norm-based exclusions). For the latter, the basis for their exclusion – which is the way the company runs its business – can be altered more easily by management. However, for sector-based exclusions, removing the causes for the exclusion will involve selling the business completely. From investors’ standpoint, the problem of limited risk sharing is more likely to be severe for firms involved in the sector-based exclusions, while the risk inherent in norm-based exclusions is more easily diversifiable, and hence less likely to be compensated. In addition, since firms in the ‘sin’ sectors (e.g., oil and gas) have a long history of operations, investors know about this aspect of their operations and have priced the risk. Unlike these firms that are excluded because of the nature of their products (sector-based exclusion), companies that are excluded due to unethical business practices (norm-based exclusion) are more likely to bear ‘hidden’ risks that are not correctly priced by the market. The mispriced risks associated with unethical behaviour suggest that these firms are more prone to overvaluation and will experience significant effects following the exclusion. This leads us to hypothesise that:

H₂: Norm-based exclusions generate a higher cost of equity capital effects than sector-based exclusions.

2.2.2. High ESG risk awareness and effects of exclusion

Surveys by Gallup in 2008 and 2010 show that citizens of some countries are more sensitised to climate change and its effects than others. The EU countries have demonstrated strong leadership in ESG and sustainable finance, primarily driven by their comprehensive regulatory framework and a strong cultural and political commitment to sustainability (The ESG Institute, 2024). They have led the way with significant regulations such as the Institutions for Occupational Retirement Provision (IORP) II and Action Plan on Sustainable Finance, which have forced institutional investors, in particular pension funds, to consider ESG matters as part of their investment management processes. Otchere et al. (2025) found that the EU countries have high ESG scores. However, because of their strong focus on sustainable investing, the countries have experienced a stronger reduction in pension assets growth in the post-SDG era than other OECD countries, suggesting that the strict policies have hurt pension assets of EU countries more than other OECD countries. Given the high climate risk awareness culture and the increased attention to climate risk in recent years, we expect excluded firms in the EU or countries with high ESG scores to experience stronger effects than other excluded firms. We hypothesise that:

H₃: The effect of exclusion of firms from high climate risk awareness (and EU) countries is stronger than that of low awareness (non-EU) countries.

3. Data and Empirical Approach

3.1. Sample construction

We obtained the list of excluded firms from 2000 to 2021 and the reasons for their exclusion from the NGPF-G website.¹ However, we collected data up to 2024, so that we can understand the pre- and post-exclusion effects. The analyst forecast data is compiled from the Institutional Brokers Earnings System (I/B/E/S). The financial data is collected from DataStream, the country-level financial development index data is from the International Monetary Fund (IMF), the gross domestic product data is obtained from the World Bank (WB), and the environmental awareness data is from Gallup Analytics. Appendix A1 lists the definition of our variables and the data sources. The distribution of our data is presented in Appendix A3.² The highest number of firms excluded from the NGPF-G portfolio are from the US (25.68%), followed by China (8.74%), and India (7.65%). As Figure 1 shows, the majority of the test firms (38.04%) were excluded in 2016, the year following the 2015 Paris Accord, and an additional 8.70% in 2017. About 45.65% of firms were excluded for producing coal or coal-based energy. The high representation of this sector in the excluded sample is not

¹ <https://www.nbim.no/en/the-fund/responsible-investment/exclusion-of-companies/>

² The data is available upon request.

surprising given the sector's high exposure to ESG risks. The second most frequent reason for exclusion is causing severe environmental damage (14.13%), followed by the production of tobacco (13.04%), the production of nuclear weapons (9.78%), and causing serious violation of human rights (9.78%). The control sample is obtained using the propensity score-matching (PSM) approach.³

[Please insert Figure 1 here]

3.2. Cost of equity

We follow prior literature to estimate the *ex-ante* cost of equity implied in the stock price and analyst forecasts. The implied cost of equity is extensively used in the literature (see Hail and Leuz, 2006; Boubakri et al., 2010; El Ghouli et al., 2011; Larocque and Lyle, 2017). To avoid any possible constraint in relative performance, we employ three different models used in El Ghouli et al. (2011) and Hail and Leuz (2006), namely, the Ohlson and Juttner-Nauroth (2005), Easton (2004), and Claus and Thomas (2001), and we refer to this cost of equity premiums as OJN, EP, and CTP, respectively. Following Chen et al. (2011), we deduct the 10-year Treasury bond yield from the estimated CoE to obtain the equity premium. Appendix A2 shows the detailed estimation procedure. Since each of the models might imperfectly represent the actual underlying cost of equity due to inherent noise, we follow previous studies (including El Ghouli et al., 2011) and use the average of the three measures as the primary dependent variable to mitigate possible noise inherent in each model. For robustness test, we also use the individual cost of equity measures.

Figure 2 illustrates the distribution of the CoE for the excluded firms over the pre- and post-exclusion periods. The graph shows that the CoE increased after the exclusion by the NGPF-G. To determine whether this increase in the cost of equity after exclusion is statistically significant, we conducted a Welch's *t-test* and obtained a statistic of -9.28 with a p-value of 0. Similarly, we examined whether the median value and variance of CoE differ between the pre- and post-exclusion periods. The Mann-Whitney test yielded a *z-statistic* of -8.971 (p-value 0), and the variance test produced an *F-statistic* of 0.75 (p-value 0). Consequently, all our tests confirm that the post-exclusion CoE is significantly different from pre-exclusion cost, suggesting that the NGPF-G's exclusions had effects on the test firms.

[Please insert Figure 2 here]

3.3. Methodology

To econometrically investigate the impact of the exclusion on the affected firms' cost of equity capital, we estimate the following panel-based multivariate regression for the test group:

$$CoE_{it} = \alpha_1 + \beta_1 PostEX_{it} + \beta_2 Firm_{it-1} + \beta_3 Gov_{it-1} + \theta_i + \gamma_i + \varepsilon_{it} \quad (1)$$

³ This approach is used to identify firms that are closest to the test firms using size, leverage, and growth as covariates.

where i indexes firms and t indexes years. The dependent variable CoE_{it} is the equally weighted average cost of equity for firm i in year t . Our primary variable of interest is $PostEX_{it}$, which is a dummy variable that takes a value of 1 for the period after the exclusion and 0 otherwise. The test firms were excluded from the NGPF-G portfolio at different periods; hence, $PostEX$ is firm- and time-variant. We include many firm-specific characteristics as control variables in order to isolate the effects of the exclusion on the cost of capital. $Firm_{it-1}$ is a vector of firm-level control variables that are commonly used in equity pricing research. It includes the natural logarithm of total assets ($SIZE_{it}$), book-value to market value of equity (BM_{it}), leverage ratio (LEV_{it}), unlevered beta ($BETA_{it}$), credit rating ($RATING_{it}$), and growth rate ($GROWTH_{it}$). These variables have been shown to correlate with cost of equity capital (Botosan et al., 2011). To further capture default risk, we control for a firm's credit ratings (Chen et al., 2018). Gov_{it-1} is the vector of firm-level corporate governance variables. It includes board size ($BOARD_{it}$), board diversity ($BDIV_{it}$), CEO duality ($CEOSEP_{it}$), the chief executive officer is a board member ($CEOB_{it}$), the chairperson was the ex-CEO ($EXCEO_{it}$), and board independence ($BIND_{it}$). Additionally, we follow Hossain and Kryzanowski (2020) to control for board size and board diversity as these variables have been shown to lead to a lower cost of equity. These firm-level control variables have been used in other earlier studies including El Ghoul et al. (2011), Balakrishnan et al. (2021) and Li et al. (2020). Finally, we control for year and firm fixed effects, ε_{it} is the i.i.d. error term, and cluster our standard errors by the firm. All our control variables are measured at the end of the previous period.

To test hypothesis 2, we examine whether the effects of the exclusion on the affected firms' equity costs depend on whether it is a sector-based or norm-based exclusion. The NGPF-G excludes firms from its portfolio for different reasons, including for (i) causing severe environmental damage, (ii) the production of coal or coal-based energy, (iii) causing serious violation of human rights and individuals' rights, (iv) the production of tobacco, (v) gross corruption, (vi) the production of nuclear weapons, ammunitions, and cluster munitions, and (vii) other reasons including exclusions for more than one reason. We categorise the exclusions into sector-based (ii, iv, vi) and norm-based (i, iii, v) and then construct a *Norm* dummy that takes a value of 1 for the norm-based exclusions and 0 for sector-based exclusions.⁴ We then estimate the following model:

$$CoE_{it} = \alpha_1 + \beta_1 PostEX_{it} + \beta_2 Norm_i + \beta_3 PostEX_{it} * Norm_i + \beta_4 Firm_{it-1} + \beta_5 Gov_{it-1} + \theta_i + \gamma_t + \varepsilon_{it} \quad (2)$$

where $Norm_i$ is the Norm dummy, $PostEX_{it} * Norm_i$ is our variable of interest. The other variables are as before. We expect the coefficient to be positive and significant if norm-based exclusions elicit stronger cost of equity effects than sector-based exclusions. Given that within each category there

⁴ We exclude category (vii) - exclusions for more than one reason - to avoid confounding effects.

could be differential effects, we also examine the cost of capital effects of the individual reasons for exclusion. Our objective is to ascertain whether, for example, being excluded for causing severe environmental damage is associated with a higher cost of equity capital. To do this, we assign a dummy variable of 1 for each exclusion reason and 0 otherwise.

To test H₃, we first use the Gallup Analytics survey data as a proxy for climate risk awareness of the excluded firm's country. The score is collected from three survey cycles conducted in 2008, 2010, and 2019. We create a dummy variable of high awareness (HAW_c) if the excluded firm's country average score is higher than the median of the sample. We then estimate the following regression:

$$CoE_{it} = \alpha_1 + \beta_1 PostEX_{it} + \beta_2 HAW_c + \beta_3 PostEX_{it} * HAW_c + \beta_4 Firm_{it-1} + \beta_5 Gov_{it-1} + \theta_i + \gamma_i + \varepsilon_{it} \quad (3)$$

where HAW_c is the high awareness dummy. We also replace HAW in separate regressions with ESG dummy and EU dummy, which takes a value of 1 if the excluded firm is from the EU or a country with ESG score higher than the median of the sample, and 0 otherwise. We expect the impact of the exclusion to be positive and stronger in high awareness countries, countries with high ESG scores, and those in the EU than otherwise.

4. Results and Analysis

4.1 Summary statistics

We present summary statistics of our key financial variables for the excluded firms (test firms) in Table 1 Panel A. Our main variable, the equity premium (CoE), has a mean (median) value of approximately 2.15 (2.05) with a standard deviation of 1.75, suggesting the existence of a wide variation in equity premium among the test firms. In terms of the individual cost of equity capital, the mean is 4.75, 0.44, and 0.81 for the Claus and Thomas (CTP), Easton (EP), and Ohlson and Juttner-Nauroth (OJN) models, respectively; the cost of equity capital based on the CTP model having the highest variability (standard deviation of 2.51) among the test firms. Approximately 14.53% of the excluded firms' board members are women, 68% are independent directors, the majority have dual CEO-Board positions, and only about 40% have separate CEO and board chair positions, and a third of the firms have former CEOs sitting on their boards. The excluded firms are profitable; they have an average return on assets of 6.43%, a growth rate of 10.37%, and an operating risk (standard deviation of ROA) of 2.93%. There is a significant variation in these variables as per the standard deviation. In terms of the information environment variables, the test firms have, on average, 28.4% institutional holdings, five institutional owners (NINS), and three analysts (NANC). They have a

turnover ratio of 1.61, a mean Amihud illiquidity measure of 0.05, and a median of almost zero (0.0002), suggesting their shares are relatively liquid.

[Please Insert Table 1 here]

As shown in Appendix A3, there are 4,575 firm-year observations belonging to 184 unique excluded firms. Approximately 25.68% of the firms are headquartered in the USA, followed by China (8.74%), India (7.65%), and Hong Kong, Japan and South Korea (5.46%). Figure 1 exhibits the distribution of excluded firms by the reasons for exclusion. The majority of the firms were excluded for producing coal and coal-related energy, and the majority were excluded in 2016, the year after the Paris Agreement. Panel B of Table 1 reports the correlation matrix of the regression variables. The CoE measure is positively correlated with the individual proxies, with CTP having the highest correlation with the composite CoE. The key explanatory variables, including institutional investors, number of analysts, illiquidity, turnover, analyst dispersion, and volatility of return on asset (ROA), have the expected relations with our dependent variables (CoE), CTP, EP, and OJN, and the control variables have the expected signs. The correlations among the explanatory variables are low, suggesting that multicollinearity is not a serious concern in our regressions.

4.2. Multivariate regression results

4.2.1 Baseline results

We conduct multivariate regression analysis by regressing the test firms' CoE on the exclusion dummy and control variables. To test hypothesis 1, we estimate a panel regression of equation 1 using the average implied equity premium of the excluded firms as the dependent variable, *PostEX* as the key explanatory variable, firm-level control variables, and firm and year fixed effects. The results of our baseline regression are presented in Table 2. Column 1 contains the results of a parsimonious specification of the cost of equity capital on *PostEX*. The coefficient of *PostEX* is positive and statistically significant at the 1% level, indicating that the equity premium increased significantly after the exclusion. This specification omits a number of variables that have been shown to be important determinants of the cost of equity capital. Thus, the initial finding is susceptible to omitted variable bias. In column 2, we include firm-specific controls (including beta, size, book-to-market (BTM), leverage, growth, and credit rating) which prior studies have shown to affect the cost of equity capital. Our key variable of interest, *PostEX*, remains positive and significant. In column 3, we estimate a more comprehensive specification of equation 1 utilising a number of firm and governance variables as control variables. Our key variable of interest, *PostEX*, continues to load positively and remains statistically significant at 1% in the full regression. The coefficient of *PostEX* indicates that the CoE of the excluded firms increased by about 0.95% after the exclusion, holding other factors constant. This is an economically large effect representing 45% of the sample mean. Considering the

full regression, the exclusion increased the divested firms' CoE by about 0.4%. This effect represents about an 18% increase in the CoE relative to the sample mean, suggesting a moderately large economic impact. These results suggest that exclusions by the NGPF-G are associated with increases in the cost of equity capital of the affected firms.

The control variables generally have the expected signs. Consistent with the findings of Gode and Mohanram (2003), the coefficient of leverage is positive and significant; beta also loads positively, while firm size exhibits a statistically negative coefficient, consistent with the findings in El Ghoul et al. (2011). Excluded firms with large independent board members and those with separate CEO and board chair positions have lower costs of capital, while those with large board size exhibit high costs of equity capital. These results are consistent with the hypothesis that information contained in the exclusions by the NGPF-G is priced by capital markets.

[Please insert Table 2 here]

4.2.2. *Heterogeneous effects: Sector-based versus Norm-based exclusions*

The Norwegian Pension Fund excludes firms from its portfolio for various reasons, which we group into sector-based and norm-based exclusions. Sector-based exclusions involve firms that produce harmful products. This category includes exclusions for the production of coal or coal-based energy, tobacco, and nuclear weapons, ammunitions, and cluster munitions. Norm-based exclusions involve firms that engage in unethical business practices, including those that cause severe environmental damage, engage in gross corruption, and/or commit serious violations of human rights. In this dichotomous analysis, we do not include firms that were excluded for more than one reason since we cannot place them under any of the categories. To test H₂, we re-estimate our baseline regression model and introduce *NormDummy*, which takes a value of 1 for norm-based exclusions and 0 for sector-based exclusions. The results are reported in Table 3 column 1.

The coefficient of the *NormDummy* is negative and significant at 5%, suggesting that companies that produce harmful products (sector-based exclusions) generally have a higher cost of capital than other firms, consistent with the argument that firms that operate in sin sectors (e.g., oil and gas) have a long history of operations and investors have priced the risk associated with the sector. Interestingly, consistent with H₂, norm-based exclusions elicit a greater increase in the cost of equity than sector-based exclusions. The interaction term *PostEX*NormDummy* is positive and strongly significant. The coefficient indicates that the CoE of the excluded firms in the norm-based category increased by about 1.67% more than that of their counterparts. Relative to the sample mean, this effect is substantial – about 78% – and is almost one full (96% of the) standard deviation, suggesting a very large economic impact. The negative coefficient on the *NormDummy* and the positive coefficient on the *PostEX*NormDummy* confirm the argument that companies excluded for unethical

business practices (norm-based exclusion) are more likely to bear risks that are not correctly priced by the market until after the exclusion.

[Please insert Table 3 here]

4.2.3. Individual reasons for exclusion and heterogeneous effects

The foregoing analysis based on the exclusion type (*Norm dummy*) could conceal significant information. The analysis implicitly assumes that the cost of capital effects are the same for the different exclusion reasons, but some exclusions may have stronger effects than others. Moreover, the categorisation of the exclusion reasons into norm-based and sector-based will not always be identical among institutional investors or researchers; hence, the constituents of the sector-based and norm-based exclusions will vary from one investor to another. To make the analysis globally applicable and to examine the cost of capital effects of each of the exclusion types, including those that were due to more than one reason, we re-estimate Model 2, where we replace the *NormDummy* with the *ExType* dummy, representing the reason for the exclusion; the variable takes a value of 1 for the reason type and 0 otherwise. The variables representing the reasons for exclusion are included in the regression one at a time and interacted with *Post*. Our objective is to determine whether certain exclusion types affected the cost of equity capital more than others. The results are presented in Table 3 columns 2 through 8. While the post dummy is consistently positive and strongly significant at 1% in all the regressions, the coefficient of the interaction terms indicates that not all the seven reasons for the exclusions are priced by the market. The higher cost of capital documented in Table 3 is driven by three main reasons, one sector-based and two norm-based exclusions.

The coefficient of our test variable in column 2, exclusions for causing severe environmental damage (*PostEX*SED*), is positive and statistically significant. Similarly, firms excluded for producing coal and coal-related products and for engaging in corrupt practices experience a significant increase in the cost of equity capital. In column 3, we find a positive and statistically significant increase in the cost of equity after the exclusion for producing coal (*PostEX*CP*). The coefficient of 0.4769 is statistically significant at 5%. The higher rate of return required by investors after the exclusion is consistent with the higher exposure of this sector to ESG risks. Similarly, the corruption variable (*PostEX*GCorrupt*) is positive and highly significant in Model 6, suggesting that the market requires a higher equity rate of return from firms that engage in corrupt practices.

In contrast, the results presented in columns 4 and 7 show that firms excluded for violations of human rights (*PostEX*SVHR*) and producing nuclear weapons (*PostEX*PNW*) do not experience significant cost of equity capital effects. Similarly, the results in column 8 show that the coefficient of exclusions for other reasons (OTHER) loads positively but is not statistically significant. While firms that produce tobacco have a higher cost of equity capital, their exclusion does not elicit additional increases in cost of equity capital. The coefficient of *PostEX*PTOBA* in column 5 is

positive but statistically insignificant. Though we do not report the control variables for brevity reasons, the signs and significance level are similar to the baseline results. To summarise, the results indicate that exclusions by the NGPF-G, on average, are priced and are associated with a higher cost of equity. However, not all exclusions are priced; exclusions due to coal production, exclusions for causing severe environmental damage, and for engaging in corruption significantly affect the cost of equity financing. It is also worth mentioning that coal divestments are significant partly because the vast percentage of coal divestments is in the latter time period (as Figure 1 indicates), but the time period itself accounts, in a large part, for the significant results. The second half of the study period, which coincides with the adoption of the SDGs, provided the impetus for many of the actions taken by governments, investors, and civil society to address not just environmental, but social and governance issues as well. The lack of significance of exclusions due to the production of nuclear weapons (just like the production of tobacco) could be due to the fact that the market has known about these undesirable products for a long time and has priced the risk. Unlike coal production that has attracted a lot of attention in recent years, the exclusion of firms producing nuclear weapons did not reveal any hidden additional risk. The insignificance of exclusions due to human rights violations could be the result of a lack of clarity about the specific human right being violated, whether it is the use of child labour, discrimination, payment of unfair wages, etc., some of which are more serious than others. The lack of specificity could account for the lack of significance of this variable.

4.3. Exclusions and cost of equity capital: Channels

Hong and Kacperczyk (2009) find that firms operating in ‘sin’ industries tend to have a lower investor base (because they are less likely to be held by norm-constrained institutions such as pension funds), they receive less coverage from analysts and have higher expected returns. The capital market equilibrium model of Merton (1987) implies that a reduction in the size of a firm’s investor base will result in a higher cost of equity capital. Excluded firms could have a smaller investor base, reduced analyst coverage, higher information asymmetry, and lower liquidity. Thus, divestments by the NGPF-G could affect the excluded firms’ cost of equity capital through changes in the firms’ information environment. The exclusions could lead to poor information environments, such as lower analyst coverage, higher analyst forecast dispersion, reduced institutional ownership holdings and, consequently, higher illiquidity, which can lead to a higher cost of equity. In this section, we examine the impact of the exclusion on these information quality variables and investigate whether they are the channels through which exclusion affects the targeted firms’ cost of equity capital.

We identify four possible channels through which exclusions could influence the excluded firms’ cost of equity. First, exclusion can result in a higher level of information asymmetry, and hence

a lower level of stock liquidity. We test the association between the exclusion and stock illiquidity by estimating the following model:

$$ILLIQ_{it} = \beta_0 + \beta_1 PostEX_{it} + \beta_2 ROA_{it-1} + \beta_3 DPRICE_{it-1} + \beta_4 PVOL_{it-1} + \beta_5 SIZE_{it-1} + \beta_6 BM_{it-1} + \beta_7 LEV_{it-1} + \theta i + \gamma i + \varepsilon_{it} \quad (4)$$

where $ILLIQ_{it}$ is illiquidity, which we measure by Amihud's (2002) illiquidity and turnover rate of liquidity (TR). Following Amihud (2002) and Kim and Kim (2023), we include profitability (ROA_{it}), daily stock price ($DPRICE_{it}$), daily stock return volatility ($PVOL_{it}$), the natural logarithm of total book assets ($SIZE_{it}$), book value to market value of equity (BM_{it}), and leverage ratio (LEV_{it}) as control variables as they have been shown to affect liquidity. A positive coefficient on $PostEX_{it}$ will be consistent with the notion that the exclusion reduced stock liquidity (increased illiquidity).

Second, based on Merton (1987) and the evidence that other institutional investors follow the exclusion decisions of the NGPF-G (Du, 2016), we expect institutional holdings in the test firms to reduce after the exclusion. To test this conjecture, we estimate the following model:

$$INST_{it} = \beta_0 + \beta_1 PostEX_{it} + \beta_2 Firm_{it-1} + \beta_3 Gov_{it-1} + \theta i + \gamma i + \varepsilon_{it} \quad (5)$$

where $INST_{it}$ is the institutional holding ratio, and the other variables are as defined. A negative coefficient on $PostEX_{it}$ will be consistent with the notion that investor holdings in the test firms reduced after the exclusion.

Third, if the exclusion leads to reduced analyst coverage, then the firm's incentives to engage in low-quality disclosure and reporting, as well as its level of information asymmetry, will increase. As a result, analysts and investors would face a higher estimation risk when evaluating the firm, eventually leading to larger forecast errors and a larger dispersion. We test this prediction by estimating the following model:

$$FDISP_{it} = \beta_0 + \beta_1 PostEX_{it} + \beta_2 SIZE_{it-1} + \beta_3 SDROA_{it-1} + \beta_4 EPSABS_{it-1} + \beta_5 RND_{it-1} + \beta_6 ROA_{it-1} + \theta i + \gamma i + \varepsilon_{it} \quad (6)$$

where $FDISP_{it}$ is the 12-month average of the analyst dispersions of earnings forecasts and is scaled by the stock price at the end of the previous fiscal year, as in Lang and Lundholm (1996). Following Ali and Son (2007), we control for firm size using the logarithm of total assets ($SIZE_{it-1}$), past volatility of return on assets ($SDROA_{it-1}$), the absolute value of change in earnings per share ($EPSABS_{it-1}$), research & development (RND_{it-1}), and profitability (ROA_{it-1}). A positive coefficient on $PostEX_{it}$ is consistent with the notion that estimation risk increased after the exclusion.

Fourth, the exclusion could increase the risk of lawsuits and boycotts against the excluded firms, which can impact the volatility of their operating performance. Therefore, we estimate the effects of the exclusion on profit volatility using the following model:

$$SDROA_{it} = \beta_0 + \beta_1 PostEX_{it} + \beta_2 Firm_{it-1} + \beta_3 Gov_{it-1} + \theta i + \gamma i + \varepsilon_{it} \quad (7)$$

where $SDROA_{it}$, the standard deviation of ROA, represents the volatility of operating performance. The definition of the other variables is as before. A positive coefficient on $PostEX_{it}$ will suggest that the exclusion accentuated the operating profit variability of the affected firms.

We report the results of these regressions in Table 4 Panel A. In all the models, the coefficient of interest, $PostEX$, has the expected signs and is statistically significant. In column 1, the coefficient of our main variable (INST) is negative and strongly significant (-0.059; t-statistic = 2.60), suggesting that institutional ownership has reduced after the divestment by the NGPF-G. The coefficient of interest in column 2 (TR) is negative and significant (coefficient -0.3483; t-statistic = 3.20), indicating that trading volume reduced after the exclusion. The coefficient of the key variable in Model 3 (DISP) shows that analyst dispersion increased in the post-exclusion period. The finding is consistent with the notion that, following exclusions, analysts and the media report less on these firms, and the reduced coverage increases the level of information asymmetry. As a result, analysts and investors face a higher estimation risk when evaluating such firms, leading to larger forecast dispersion. In line with the expectation of a poor information environment after the exclusion, illiquidity (ILLIQ) increased after the exclusion (see Model 4). Finally, consistent with the view that possible boycott of the targeted firms will impact the volatility of their operating performance, we find that the post-exclusion variable is significantly positive in the STROA regression (Model 5). These results are consistent with the theoretical predictions of Merton (1987) and Heinkel et al. (2001) that exclusionary investing by green investors reduces demand for the shares of firms with poor social responsibility. These firms tend to have smaller investor bases, reduced analyst coverage, higher information asymmetry, and lower liquidity because of reduced investor holdings.

[Please insert Table 4 here]

Having shown that the exclusions have a significantly negative effect on the affected firms' information quality, we explore how the post-exclusion information quality variables affect the firms' cost of capital by estimating the following regression.

$$CoE_{it} = \alpha_1 + \beta_1 PostEX_{it} + \beta_2 NFAC_{it} + \beta_3 DISP_{it} + \beta_4 INST_{it} + \beta_5 ILLIQ_{it} + \beta_6 PostEX_{it} * NFAC_{it} + \beta_7 PostEX_{it} * DISP_{it} + \beta_8 PostEX_{it} * INST_{it} + \beta_9 PostEX_{it} * ILLIQ_{it} + \beta_{10} Firm_{it-1} + \beta_{11} Gov_{it-1} + \theta i + \gamma i + \varepsilon_{it} \quad (8)$$

where $NFAC_{it}$ is the number of financial analysts covering the firm, $DISP_{it}$ is the dispersion of analyst forecasts, $INST_{it}$ is the total institutional ownership ratio, and $ILLIQ_{it}$ is Amihud's (2002)

illiquidity ratio. We use the interaction term between $PostEX_{it}$ and each of the information quality variables reported in Panel A to assess the impact of the post-exclusion information effect on the cost of equity capital. Based on our conjecture, we expect the deteriorated information quality variables to affect the CoE in the post-exclusion period. The results are reported in Panel B of Table 4. The coefficient of $PostEX$ is consistently positive and significant in all the regressions. More importantly, the interaction terms load positively. Consistent with the information asymmetry argument, the number of analysts (NFAC) and higher institutional ownership (INST) are negatively related to the cost of equity capital. The coefficients of the interaction terms $PostEX*NFAC$ and $PostEX*INST$ are negative and significant, suggesting that the reduced institutional ownership after the exclusion led to an increase in the cost of equity. Similarly, the coefficient of the $PostEX*DISP$ loads positively, suggesting that the increase in the analyst forecast dispersion after the exclusion leads to an increase in the required rate of return. Similarly, the increase in illiquidity due to the exclusion, documented in Panel A, leads to an increase in the cost of equity. The variable $PostEX*ILLIQ$ is positive and strongly significant (coefficient 5.8222; t-statistics = 4.19). These results of the full regression (column 4 of Panel B) show that reduced investor holdings and the number of analysts, and increased analyst forecast dispersion culminating in higher illiquidity, are the channels through which exclusions by the NGPF-G affect equity pricing. The findings are in line with Merton (1987), Hong and Kacperczyk (2009) and Heinkel et al.'s (2001) argument that firms with a smaller investor base experience reduced analyst coverage and have lower liquidity and higher required rates of return.

4.4. High awareness and exclusion

To test H3, we estimate equation 3 using three measures of high climate-risk awareness based on Gallup Survey data, ESG data, and EU dummy variable. We start with a Gallup high awareness (HAW) dummy and then replace it with ESG scored and the EU dummy. We expect the impact of the exclusion to be positive and stronger in high awareness countries, countries with high ESG scores, and in the EU countries than otherwise. The results are presented in Table 5.

We find that excluded firms in high environmental awareness countries, as per Gallup survey data, generally exhibit lower cost of equity financing. However, those firms experienced a significant increase in the cost of equity capital after the exclusion compared to those in low awareness countries. The coefficient of $PostEX*HAW$, our variable of interest, is highly significant at 1%. The exclusion increased the CoE of firms from HAW by roughly 0.62% more than firms from low HAW. This effect constitutes 29% of the mean CoE and 35% of the standard deviation, signalling a more pronounced economic effect. Similarly, countries that rank high on ESG scores have lower costs of equity capital. The exclusions, however, lead to an increase in the cost of equity capital. Consistent with the ESG results, while firms from the EU have a lower cost of equity, exclusion leads to a significant increase

in the cost of equity of firms in the EU countries than those from non-EU countries. Given that the NGPF-G is a global leader in ethical and sustainable investing and is well known in the EU, its exclusions have a stronger impact on the firms located in the region.

[Please insert Table 5 here]

Figures 3 illustrate the interaction effects detailed in Table 5. In line with Murphy and Aguinis (2022), the plots depict predicted values across the entire range of the dependent variable and various moderator levels. The figures reveal a distinct strengthening interaction: the impact of exclusion on the cost of equity is stronger in countries with greater climate risk awareness, higher country-level ESG scores, and within the EU countries. These visuals confirm that the economic effects of exclusion depend on institutional and informational contexts.

[Fix Figure 3 here]

4.5. Additional analysis

4.5.1 Recency effects of NGPF-G exclusions

In recent years, governments and regulators have made increasing efforts to address the causes of climate change and its effects. The adoption of the SDGs by the UN in 2015 created societal and political pressure on institutional investors to tackle sustainable investment issues (Bauer et al., 2021). Since then, many countries and institutions, including pension funds, have adopted sustainable investment principles. According to Refinitiv (2022), the number of companies setting carbon targets more than doubled between the Paris 2015 and Glasgow 2022 climate summits. Total assets under management in global ESG-related funds reached a record of \$4.7 trillion in the second quarter of 2021⁵. Given the increased awareness of and efforts to mitigate climate risks, we expect the recent exclusions by the NGPF-G to elicit stronger effects than earlier exclusions.

To test this conjecture, we split our study period into two and construct a *RecentDum* variable that takes a value of 1 for the latter half of our study period and 0 for the earlier half and re-estimate our main model. The results are presented in Appendix A4. The *RecentDum* is positive and significant, suggesting that the cost of equity capital has increased in recent years. Consistent with our conjecture, the coefficient of *PostEx*RecentDum* is positive and strongly significant at 1%, suggesting that the cost of equity capital effect of exclusions by the NGPF-G is stronger for firms that were recently excluded than for those excluded earlier. Also, firms from high ESG-risk awareness countries that have recently been excluded from the portfolio of the NGPF-G experienced a significantly higher increase in the cost of equity financing than those from low awareness countries. Similarly, the recency effects are also stronger for excluded firms from the EU than their counterparts

⁵ Refinitiv (2022), Tackling climate change by the numbers; a data-driven approach to COP26's ambitious agenda.

from non-EU countries. These findings indicate that, in countries with high environmental awareness, being branded as a bad environmental actor has stronger negative consequences.

4.5.2 Exclusions and value effects

Exclusion can affect a firm's value through the cost of equity capital and/or future cash flow channels. Based on the discounted cash flow model, the higher cost of equity financing should theoretically decrease firm value, all things held constant. Additionally, if exclusion hurts the excluded firm's profitability because of boycotts and reduced revenue, it should also have a negative effect on the firm's cash flow. In this section, we test the value effects of exclusion by examining the association between exclusion, operating performance, and firm value. Following prior studies, including Huang et al. (2020), we measure operating performance as the industry-adjusted operating income before depreciation, scaled by average assets (adjusted ROA) and also proxy firm value by Tobin's Q (TQ). We examine the effects of the exclusion on operating performance (adjusted ROA) and subsequently examine the joint effect of cost of equity capital and operating performance on firm value by estimating the following regressions:

$$AdjROA_{it} = \alpha_1 + \beta_1 PostEX_{it} + \beta_2 SIZE_{it} + \beta_3 TQ_{it} + \beta_4 BM_{it} + \beta_5 LEV_{it} + \beta_6 CAPEX_{it} + \beta_7 RND_{it} + \theta i + \gamma i + \varepsilon_{it} \quad (9)$$

$$TQ_{it} = \delta_0 + \beta_1 PostEX_{it} + \beta_2 CoE_{it} + \beta_3 AdjROA_{it} + \beta_4 PostEX_{it} * CoE_{it} + \beta_5 PostEX_{it} * AdjROA_{it} + \beta_6 Firm_{it-1} + \beta_7 Gov_{it-1} + \theta i + \gamma i + \varepsilon_{it} \quad (10)$$

where $AdjROA_{it}$ is the industry-adjusted ROA before depreciation (ROAB) and after depreciation (ROAA), CoE_{it} is the cost of equity, TQ_{it} is the Tobin's Q, RND is research & development expenses, and $CAPEX_{it}$ is capital expenditure. The other variables are the same as in the baseline regression. Though not reported here for the sake of brevity, the excluded firms experienced a decrease in profitability after the exclusion. The *PostEX* variable is negative and strongly significant at the 1% level, suggesting that exclusion by NGPF-G hurts the targeted firms' profitability.

The impact of the exclusion on firm value is reported in Table 6. Model 1 presents the results where we use before-tax ROA (ROAB) as the operating performance variable, and Model 2 shows the results where after-tax ROA (ROAA) is used as a proxy for operating performance. The coefficient of *PostEX* is negative and significant at 5%, indicating that the value of the excluded firms dropped in the post-exclusion period. As expected, higher profitability leads to higher firm value. Similarly, the coefficient of *CoE* is negative in the TQ regression, indicating that a higher cost of equity capital leads to lower firm value. More importantly for our purpose, the interaction term, *PostEX*CoE*, loads negatively in the TQ regressions and is strongly significant at the 1% level, confirming the conjecture that the increase in cost of equity after the exclusion negatively affected

firm value. To provide a stronger test of the impact of exclusion, we also estimate change regression using changes in the variables from the year of exclusion to three years after the exclusion and find that the coefficient of ΔCoE is negative and significant, suggesting that the drop in firm value (TQ) documented above following the exclusion is caused in part by the increase in cost of equity.

[Please insert Table 6 here]

4.5.3. Propensity score matching

To address the concern that we may be capturing some sporadic correlation and not causality between exclusions and the cost of equity, we investigate the relationship between exclusion and the cost of equity for the test group and the control samples. We selected two distinct control samples: one set is drawn from the list of firms that are still in the NGPF-G portfolio (inNGPF), and the other control sample consists of firms drawn from the same country and industry as the excluded firms (notNGPF). Using these two control samples allows us to isolate the effects of exclusions by NGPF-G. We employ the propensity score-matching (PSM) approach to select the sample firms using size, leverage, and growth as covariates. We subsequently estimate the following regression model:

$$\text{CoE}_{it} = \delta_0 + \beta_1 \text{PostEX}_{it} + \beta_2 \text{EXCL}_i + \beta_3 \text{PostEX}_{it} * \text{EXCL}_i + \beta_4 \text{Firm}_{it-1} + \beta_5 \text{Gov}_{it-1} + \theta_i + \gamma_i + \varepsilon_{it} \quad (11)$$

where EXCL_i is a dummy variable equal to 1 for excluded firms and 0 for control firms (i.e., inNGPF and/or notNGPF). The other variables are as defined. The results of the difference-in-difference regressions are presented in Table 7. Column 1 shows the combined results where the control sample consists of both inNGPF and notNGPF, column 2 presents the results of the regression that includes the control sample of firms that are in the Fund's portfolio (inNGPF), and column 3 shows the regression results where the control sample consists of notNGPF firms. In column 1, our coefficient of interest, $\text{PostEX}_{it} * \text{EXCL}_i$, is positive and strongly significant (coefficient = 0.2563; t-statistics = 3.03), indicating that the excluded firms experienced a significantly higher cost of equity than the control sample. The results in column 2 show that the excluded firms incurred a significantly higher cost of equity capital in the post-exclusion period compared to their counterparts that are still in the NGPF-G portfolio. The increase in the cost of equity in the post-exclusion period is strongly significant at 1% (coefficient 0.2893, t-statistic = 3.02) compared to the marginally high cost of equity capital prior to the exclusion (coefficient = 0.1585; t-statistic = 2.66). The excluded firms also experienced a significant increase in the cost of equity financing than their counterparts from the same country (see column 3). As before, the control variables are of the correct signs. These PSM-control sample results show that the increase in the cost of equity experienced by the excluded firms is not due to random or omitted country-level factors that affect the cost of equity capital.

[Please insert Table 7 here]

5. Robustness Test

To ascertain the robustness of our results we carry out additional tests, using individual cost of equity metrics, alternative estimation methods, and addressing endogeneity and omitted variables bias.

5.1. Individual cost of equity measures

In the analysis thus far, we have used the composite cost of equity capital as our dependent variable. The variable consists of the equally weighted average of the three costs of equity capital metrics based on the Ohlson and Juttner-Nauroth (2004), Easton (2004), and Claus and Thomas (2001) models. The composite measure could conceal the unique effects of the individual cost of equity capital measures. To ensure that our findings are robust to the use of different measures of equity premiums, we re-estimate our baseline regression by replacing the average CoE with the individual cost of equity based on the OJN, EP, and CTP models and interact the metrics with the *PostEX* variable. The results are presented in Table 8. Columns 1, 2, and 3 contain the results using the equity premium based on OJN, EP, and CTP models, respectively. Our variable of interest, *PostEX*, is consistently positive and significant, at least at the 5% level, confirming our findings based on the composite cost of equity measure that the exclusion leads to an increase in the cost of equity capital of the affected firms.

[Please insert Table 8 here]

5.2. Addressing potential endogeneity issues

Prior studies suggest that firm-level corporate governance may correlate with both ESG risks (which led to the exclusion) and the cost of equity capital (see Barnea and Rubin, 2010). Moreover, a firm's decision to engage in ESG activities may not be independent of its cost of equity capital, as suggested by El Ghouli et al. (2011); hence, our analysis could be subject to reverse causality. Therefore, in the third robustness test, we separately include additional firm-level variables related to corporate governance, investor activities, and financial constraints to mitigate the potential impact of omitted variable bias and report the results in Table 9. In Model 1, we include the logarithm of one plus the number of institutional investors (NINS) as an additional control variable; for Model 2, we include the logarithm of one plus the number of analysts following the firm (NANC); ownership concentration ratio – Herfindahl-Hirschman index (HERF) is included in Model 3; analyst forecast error (STDAF) in Model 4; the size of CEO compensation (EXCOM) in Model 5. In models 6 and 7, we add the country-level financial development index (FDIN) and log of GDP per capita in US dollars (GDPPC), respectively. These additional control variables are significant (except ownership concentration ratio) and have the expected sign. In all the regressions, our variable of interest, *PostEX*, remains consistently positive and significant after including these additional variables.

[Please insert Table 9 here]

5.3. Alternative estimation models: Instrumental variable (IV) regression and GMM

We also apply the instrumental variable (IV) and dynamic GMM estimation methods to handle the endogeneity and reverse causality, respectively. Endogeneity can significantly challenge causal claims in management research, potentially leading to biased model estimates (Hill et al., 2021). Du et al. (2023) identified various sources of endogeneity and proposed several mitigation strategies, particularly in the context of CSR studies. However, there is a consensus that finding and applying a suitable instrument remains a challenge. The Gaussian Copula (GC) approach, introduced by Park and Gupta (2012), is an instrument-free method that could serve as an alternative for addressing endogeneity. Nevertheless, others have cautioned that researchers must carefully evaluate the assumptions of the GC approach to avoid biased estimates (Eckert and Hohberger, 2022). In our paper, we encounter an additional challenge because our endogenous regressor, *PostEX*, is a binary variable. Therefore, we employ an alternative model, GC-IV, with the Lewbel (2012) control function. Lewbel's method is suitable when other identification sources are lacking, and its estimator takes the form of a modified two-stage least squares (2SLS) or generalised method of moments (GMM). Le Moglie et al. (2015) are among the researchers who employed the estimator in a binary context. We estimate the model and present the results of our GC-IV (Lewbel) analysis in column 8 of Table 9.⁶ The coefficient of *PostEX* is consistently positive and significant, while the *GC-Control PostEX* is insignificant, suggesting little to no endogeneity. However, the negative coefficient indicates that the excluded firms may have some unobserved characteristics other than exclusion.

Also, to mitigate the issue of reverse causality (i.e., the possibility that the previous period's cost of equity affects current CSR investment, which might have led to the exclusion, we follow Chen et al. (2011) and include the lagged equity risk premium as an independent variable. Given the dynamic nature of the specification, we employ the system GMM technique developed by Blundell and Bond (1998) as the estimation method. As reported in column 9 of Table 9, the lag variable is positive and significant. More importantly, our variable of interest, *PostEX*, continues to be positive and significant. These results suggest that our finding that exclusion leads to an increase in the cost of equity capital is not due to endogeneity.

6. Summary and Conclusion

Traditional finance predominantly ignores ethics and the ethical implications of financial strategies (Horrigan, 1987; Bernadi et al., 2008) and is lagging behind in making meaningful contributions to

⁶ To estimate the model, we first generated Lewbel's (2012) instrument using copula-transformed exogenous variables and residuals from a first-stage linear probability model (LPM) with firm and year fixed effects. We then construct the copula control term for the endogenous regressor:

$c_i = \Phi^{-1} \left(\hat{F}_{PostEX}(PostEX_i) \right)$ where $\hat{F}$ is the empirical distribution of the endogenous regressor from stage 1 and Φ^{-1} is the normal quantile. Finally, we re-estimate the outcome equation, including *PostEX* and the copula controls c_i , to get the estimations (see Lewbel (2012) for further details of the methodology).

society (Brooks et al., 2019). In light of this concerning limitation, there has been a growing call to extend neoclassical finance to incorporate ethical implications of financial policies and decisions and to conduct research that is ethically informed so that it benefits society (Brooks et al., 2019; Du et al., 2023). Businesses are not merely financial entities, but their activities have wider and important ethical implications, such as climate change, among others (Greenwood and Freeman, 2017). Finance theories that leave ethics to one side risk the inaction of managers due to the assumption that investors would act by themselves to adjust their portfolio following any investment by the firm that might be deemed suboptimal to its stakeholders (Horrigan, 1987). This is profoundly wrong both morally and ethically as it means the shifting of the burden from managers to investors, and a strong suggestion has been put forward to incorporate ethics into financial decision-making, as there is more to life than market returns (Horrigan, 1987).

Firms deviate from ethical investment due to the focus of the neoclassical finance theory on shareholder wealth maximisation. However, the recent development of stakeholder theory, which is seen to be a departure from shareholder value, emphasises sustainable investment practices that serve the interests of society as part of the wider stakeholders. In this regard, divestment is considered an effective tool to promote ethics within the neoclassical investment framework as it is viewed as an absolute moral commitment to socially responsible investing (SRI), particularly when addressing issues deemed unacceptable, such as climate change or human rights violations (Dawkins, 2016). It acts as a public censure and statement of disapproval, which helps strip unethical industries, like the fossil fuel sector, of their ‘social license to operate’ (Becht et al., 2023). This strategy aims to create a stigma around harmful practices, signalling to other investors and the public that these activities are morally unacceptable and increasing pressure for policy change (Ansar et al., 2013).

The Norwegian Government Pension Fund Global (NGPF-G), the largest sovereign wealth fund, well known for its ethical investment principles, has excluded several firms from its portfolio due to sustainability concerns. Given the financial might of such a leader in ethical investing with a significant following, its exclusion decisions significantly impact the targeted firms. We examine the financial implications of divestment by the world’s largest sovereign wealth fund due to non-compliance with ethical investment (ESG investing) focusing on whether and how the NGPF-G’s exclusions impact the affected firms’ cost of equity financing and find that exclusions are priced by the capital markets. The excluded firms experienced a higher cost of equity capital compared to a matched sample of firms that are in the NGPF-G portfolio, as well as a control sample from the same country as the excluded firm. This finding documents the detrimental effect of noncompliance with ethical investment by portfolio companies. By showing that exclusions increase the cost of equity capital for affected firms, the paper demonstrates that capital markets price this information, which could potentially incentivise firms to make their corporate behaviour more ethical.

Consistent with the notion that firms operating in sin sectors (e.g., oil and gas) have a long history of operations and that investors know the risk associated with their operations, we find that firms in sin sectors exhibit a higher cost of equity capital than firms in other sectors. Interestingly, firms that are excluded due to unethical business practices (norm-based exclusion) experience a significantly higher increase in the cost of equity capital than those that produce ‘sinful’ products (sector-based exclusions). This finding is consistent with the assertion that firms that engage in unethical business practices are more likely to bear risks that are not correctly priced by the market until after the exclusion. However, not all exclusions are priced. Exclusions for causing serious environmental damage, coal production, and for engaging in corruption are the ones that are significantly priced. The result supports the notion that ethical investment campaigns often argue that the ‘sin’ is not in the product itself, but in the practice and motives of the company that aggressively promotes behaviour causing collective ecological damage and social inequality (Scott, 2016). Divestment, in this context, is a challenge to the power of executive groups manipulating public behaviour for profit maximisation (Scott, 2016)

To provide supporting evidence that the divestments are responsible for the higher cost of equity capital for the firms, we investigate the channels through which exclusions affect the targeted firms’ cost of equity capital and find that, after the divestment, institutional ownership reduces and fewer analysts cover the firms. These changes in the excluded firms’ information environment led to higher illiquidity, which affected the firms’ cost of equity capital. Furthermore, to ensure that the increase in the cost of equity capital is due to the exclusion rather than some sporadic correlation, we investigate the relationship between exclusion and the cost of equity for the test group and the control sample. The excluded firms experienced a significant increase in the cost of equity financing compared to their counterparts that are still in the NGPF-G portfolio as well as the sample from the same country. This finding suggests that the increase in the cost of equity experienced by the excluded firms is not due to random or omitted country-level factors that affect the cost of capital.

The effects of the exclusions are also stronger for firms that were recently excluded from the Fund’s portfolio, in particular after the adoption of the SDG goals in 2015, than for those excluded earlier. Also, excluded firms from high climate risk awareness countries experienced a significant increase in the cost of equity finance compared to firms from low climate risk awareness countries. The increase in the cost of equity after the exclusion negatively affects firm value. Further analysis suggests that the drop in firm value (TQ) following the exclusion is caused in part by the increase in the cost of equity. Overall, our results suggest that being excluded from the NGPF-G portfolio for ethical and environmental concerns bodes ill for the targeted firms. The results are robust to the use of different estimation techniques, cost of equity metrics, measures of recency effects, and potential endogeneity concerns.

Our study presents a few interesting directions for future research. First, our results indicate that divestments by the NGPF-G lead to an increase in the cost of equity capital of the excluded firms, suggesting that exclusions are not a zero-sum game, but they do have real consequences. We have also shown that the value of the excluded firms reduces after the exclusion. It would be interesting to ascertain whether the exclusions and the attendant effects compel the affected firms to change their practice and become better corporate citizens. Second, when a high-profile ethical and environmental activist and an informed shareholder like the NGPF-G exits in discontent, some institutional investors may find it expedient to follow its exclusion decisions, otherwise they could be perceived to be poorly informed and could suffer cash flow consequences. However, there are compelling reasons to expect that the NGPF-G may not attract other institutional followers; for example, as a SWF, it does not hold purely economic interests in the portfolio firms. Also, following the exclusion decisions of the SWF might be perceived as an admission of poor ex-ante stock selection ability. Therefore, another area for further research could be to examine whether there is indeed a follow-the-leader effect.

References

- Amihud, Y. (2002). Illiquidity and stock returns: cross-section and time-series effects. *Journal of Financial Markets*, 5, 31-56. [https://doi.org/10.1016/S1386-4181\(01\)00024-6](https://doi.org/10.1016/S1386-4181(01)00024-6).
- Ansar, A., Caldecott, B. and Tilbury, J. (2013). Stranded assets and the fossil fuel divestment campaign: What does divestment mean for the valuation of fossil fuel assets. Stranded Assets Programme, Smith School of Enterprise and the Environment, University of Oxford, Oxford, UK.
- Ayoubi, K.A. & Enjolras, G. (2020). How Norway's sovereign wealth fund negative screening affects firms' value and behaviour, *Business Ethics: The Environment & Responsibility*, 30, 19 – 37. <https://doi.org/10.1111/beer.12314>
- Balakrishnan, K., Shivakumar, L. & Taori, P. (2021). Analysts' estimates of the cost of equity capital. *Journal of Accounting and Economics*, 71, 101367. <https://doi.org/10.1016/j.jacceco.2020.101367>
- Balbaa, M., Dong, B., Jial, P., Vostroknutov, A. & Worch, M. (2025). 'Norms make investors socially responsible' (February 17, 2025). Available at SSRN: <https://ssrn.com/abstract=5141332> or <http://dx.doi.org/10.2139/ssrn.5141332>
- Barnea, A., & Rubin, A. (2010). Corporate social responsibility as a conflict between shareholders. *Journal of Business Ethics*, 97, 71-86. <https://doi.org/10.1007/s10551-010-0496-z>
- Basak S, & Cuoco D. (1998). An equilibrium model with restricted stock market participation. *Review of Financial Studies*, 11, 309–341. <https://www.jstor.org/stable/2646048>
- Bauer, R., Ruof, T. & Smeets, P. (2021). Get Real! Individuals Prefer More Sustainable Investments. *Review of Financial Studies*, 3976-4043 <https://doi.org/10.1093/rfs/hhab037>
- Becht, M., Pajuste, A. and Toniolo, A. (2023). Voice through divestment. European Corporate Governance Institute Finance Working Paper No. 900. <http://dx.doi.org/10.2139/ssrn.4386469>
- Blitz D., Swinkels, L & van Zanten J. A. (2020). Does sustainable investing deprive unsustainable firms from fresh capital? *Journal of impact and ESG investing* 1, 1-16. <https://www.unpri.org/pri>.
- Blitz, D. & Swinkels, L. (2020). Is exclusion effective? *Journal of Portfolio Management*, 46, 42-48. <http://dx.doi.org/10.2139/ssrn.3337779>
- Blundell, R., & Bond, S. (1998). Initial conditions and moment restrictions in dynamic panel data models. *Journal of Econometrics*, 87, 115-143. [https://doi.org/10.1016/S0304-4076\(98\)00009-8](https://doi.org/10.1016/S0304-4076(98)00009-8)
- Borisova, G., Brockman, P., Salas, J. & Zagorchev, A. (2012) Government ownership and corporate governance: Evidence from the EU, *Journal of Banking and Finance*, 36, 2917 – 2934. <http://dx.doi:10.1016/j.jbankfin.2012.01.008>
- Botosan, C. & Plumlee, M. & Wen, H. (2011). The relation between expected returns, realized returns, and firm risk characteristics. *Contemporary Accounting Research*, 28, 10.1111. <https://doi.org/10.1111/j.1911-3846.2011.01096.x>
- Boubakri, N., Guedhami, O., & Mishra, D. (2010). Family control and the implied cost of equity: Evidence before and after the Asian financial crisis. *Journal of International Business Studies* 41, 451-474. DOI: [10.1057/jibs.2009.77](https://doi.org/10.1057/jibs.2009.77)
- Bortolotti, B., Fotok, V., Megginson, W. & Miracky, W. (2015). The sovereign wealth fund discount: Evidence from public equity investments. *Review of Financial Studies*, 28, 2993 – 3035. <https://doi.org/10.1093/rfs/hhv036>
- Brooks, C., Fenton, E., Schopohl, L. and Walker, L. (2019). Why does research in finance have so little impact? *Critical Perspectives on Accounting*. 58, 24 – 52. <https://doi.org/10.1016/j.cpa.2018.04.005>
- Cahan, S.F., Chen, C. & Chen, L. (2017). Social norms and CSR performance. *Journal of Business Ethics*, 145, 493 – 508. <https://www.jstor.org/stable/45022276>
- Chava, S. (2014). Environmental externalities and cost of capital. *Management Science*, 60, 2223-2247. <https://doi.org/10.1287/mnsc.2013.1863>

- Chen, K.C.W., Chen, Z., & Wei, K.C.J. (2011). Agency costs of free cash flow and the effect of shareholder rights on the implied cost of equity capital. *Journal of Financial and Quantitative Analysis*, 46, 171-207. <https://doi.org/10.1017/S0022109010000591>
- Chen, Y., Hung, M., & Wang, Y. (2018). The effect of mandatory CSR disclosure on firm profitability and social externalities: Evidence from China. *Journal of Accounting and Economics*, 65, 169-190. <https://doi.org/10.1016/j.jacceco.2017.11.009>
- Clarkson, M. (1995). A stakeholder framework for analyzing and evaluating social performance. *Academy of Management Review*, 20, 92 – 118. <http://www.jstor.org/stable/258888>.
- Claus, J., & Thomas, J. (2001). Equity premia as low as three percent? Evidence from analysts' earnings forecasts for domestic and international stock markets. *Journal of Finance*, 56, 1629-1666. <https://doi.org/10.1111/0022-1082.00384>
- Dawkins, C.E. (2016). Elevating the role of divestment in socially responsible investing. *Journal of Business Ethics*, 153, 465 – 478. <https://doi.org/10.1007/s10551-016-3356-7>
- Dewenter, K., Han, X. & Malatesta, P. (2010). Firm values and sovereign wealth fund Investment. *Journal of Financial Economics*, 98, 256 – 278. <https://doi.org/10.1016/j.jfineco.2010.05.006>
- Dhaliwal, D., Eheitzman, S., & Li, Z. (2006). Taxes, leverage, and the cost of equity capital. *Journal of Accounting Research*, 44, 691-723. <https://doi.org/10.1111/j.1475-679X.2006.00214.x>
- Donaldson, T. & Preston, L. E. (1995). The stakeholder theory of the corporation: concepts, evidence and implications. *Academy of Management Reviews*, 20, 65 – 91. <https://doi.org/10.2307/258887>
- Driscoll, C. and Starik, M. (2004). The Primordial stakeholder: Advancing the conceptual consideration of stakeholder status for the natural environment. *Journal of Business Ethics*, 49, 55 – 73.
- Du, S., El Akremi, A., & Jia, M. (2023). Quantitative research on corporate social responsibility: A quest for relevance and rigor in a quickly evolving, turbulent world. *Journal of Business Ethics*, 187, 1-15. <https://doi.org/10.1007/s10551-022-05297-6>
- Easton, P. D. (2004). PE ratios, PEG ratios, and estimating the implied expected rate of return on equity capital. *The Accounting Review*, 79, 73-95. <http://dx.doi.org/10.2139/ssrn.423601>
- Eckert, C., & Hohberger, J. (2022). Addressing endogeneity without instrumental variables: An evaluation of the Gaussian Copula approach for management research. *Journal of Management*, 49, 1460-1495. <https://doi.org/10.1177/01492063221085>
- El Ghouli, S., Guedhami, O., Kwok, C.Y., & Mishra, D.R. (2011). Does corporate social responsibility affect the cost of capital? *Journal of Banking and Finance*, 35, 2388-2406.
- Fernandes, N. (2014) The impact of sovereign wealth funds on corporate value and Performance. *Journal of Applied Corporate Finance*, 26, 76 – 84. <https://doi.org/10.1111/jacf.12056>
- Fich, E. M., & Shivdasani, A. (2007). Financial fraud, director reputation, and shareholder wealth. *Journal of Financial Economics*, 86, 306-336. <https://doi.org/10.1016/j.jfineco.2006.05.012>
- Fotok, V., Bortolotti, B. & Megginson, W. (2008). The financial impact of sovereign wealth fund investments in listed companies, <https://www.researchgate.net/publication/241758435>
- Freeman, R.E., Harrison, J.S., Wicks, A.C., Parmar, B. & de Colle, S. (2010). Stakeholder theory: The state of art, Cambridge University Press, Cambridge. <https://doi.org/10.1080/19416520.2010.495581>
- Friedman, M. (1970). The social responsibility of Business is to increase its profit, The New York Times, September 13, 1970.
- Gibson, K. (2000). The moral basis of stakeholder theory. *Journal of Business Ethics*, 26, 245–257.
- Ghouma, H.H. & Ouni, Z. (2022a) The sovereign wealth funds risk premium: Evidence from the cost of debt financing. *Journal of Corporate Finance*, 76, 102255. <https://doi.org/10.1016/j.jcorpfin.2022.102255>
- Ghouma, H. H. & Ouni, Z. (2022b) SWF investments and debt maturity of target firms:

- International evidence. *Finance Research Letters*, 46, 102312.
<https://doi.org/10.1016/j.frl.2021.102312>
- Gode, D., & Mohanram, P. (2003). Inferring the Cost of Capital Using the Ohlson-Juettner Model. *Review of Accounting Studies* 8, 399–431.
- Greenwood, M. and Freeman, E. (2017). Focusing on Ethics and Broadening our Intellectual Base. *Journal of Business Ethics*, 140 (1), 1 – 3. DOI 10.1007/s10551-016-3414-1
- Guisande, D.P., Harjoto, M.A., Hoepner, A.G.F. & O’Sullivan, C. (2024). Ethics and banking: Do banks divest their kind?, *Journal of Business Ethics*, 192, 191 – 223.
<https://doi.org/10.1007/s10551-023-05476-z>
- Harrison, J. S., Freeman, R., & Sá de Abreu., M.C. (2015). Stakeholder theory as an ethical approach to effective management: Applying the theory to multiple contexts. *Review of Business Management*, 17, 858-869. <https://10.7819/rbgn.v17i55.2647>.
- Heinkel, R., Kraus, A., & Zechner, J. (2001). The effect of green investment on corporate behavior. *The Journal of Financial and Quantitative Analysis*, 36, 431-449.
<https://doi.org/10.2307/2676219>
- Hill, A.D., Johnson, S.G., Greco, L.M., O’Boyle, E.H., & Walter, S.L. (2021). Endogeneity: A review and agenda for the methodology-practice divide affecting micro and macro research. *Journal of Management*, 47, 105-143. <https://doi.org/10.1177/0149206320960533>
- Hong, H., & Kacperczyk, M. (2009). The price of sin: The effects of social norms on markets. *Journal of Financial Economics*, 93, 15–36. <https://doi.org/10.1016/j.jfineco.2008.09.001>
- Horrigan, J. O. (1987). The Ethics of the New Finance. *Journal of Business Ethics*. 6, 97 – 110.
- Hossain A. T., & Kryzanowski L. (2020). Board Diversity and Cost of Equity. Available at SSRN: <https://ssrn.com/abstract=3627645> or <http://dx.doi.org/10.2139/ssrn.3627645>
- Huang, Peng, Yue Lu, & Marvin Wee. (2020). Corporate governance analysts and firm value: Australian evidence. *Pacific-basin Finance Journal*, 63, 101430.
<https://doi.org/10.1016/j.pacfin.2020.101430>
- Hudson, R. (2005). Ethical Investing: Ethical Investors and Managers. *Business Ethics Quarterly*. 15(4), 641 – 657. <https://doi.org/10.5840/beq200515445>
- Kim, J. & Kim, Y. (2023). Which stock price component drives the Amihud illiquidity premium? *North American Journal of Economics and Finance*, 64, 101876.
<https://doi.org/10.1016/j.najef.2022.101876>
- Lang, M.H., & Lundholm, R.J. (1996). Corporate disclosure policy and analyst behavior, *The Accounting Review*, 71, 467-492.
- Larocque, S.A., & Lyle, M.R. (2017). Implied cost of equity capital estimates as predictors of accounting returns and stock returns. *Journal of Financial Reporting*, 2, 69-93.
<https://dx.doi.org/10.2139/ssrn.2370686>
- Le Moglie, M, Mencarini, L., & Rapallini, C. (2015). Is it just a matter of personality? On the role of subjective well-being in childbearing behavior. *Journal of Economic Behavior & Organization*, 117, 453-475. <https://doi.org/10.1016/j.jebo.2015.07.006>
- Lestan, F. & Kabiraj, S. (2025). Value creation in economic theory: Neoclassical and ecological Approach. *South Asian Journal of Management*, 32, 7 – 20.
<https://doi.org/10.62206/sajm.32.2.2025.7-20>
- Lewbel, A. (2012). Using heteroscedasticity to identify and estimate mismeasured and endogenous regressor models. *Journal of Business & Economic Statistics*, 30, 67-80.
<https://doi.org/10.1080/07350015.2012.643126>
- Lewin, T. (1983). Business Ethics’ New Appeal. The New York Times. Published on 11th December 1983.
- Li, M., Wu, J., Zhang, L. & Zou, L. (2020). Board reforms and the cost of equity: international evidence. *Accounting and Finance*, 60, 4497-4531. <https://doi.org/10.1111/acfi.12654>
- Lopez-Cabarcos, M.A., Ziane, Y., Lopez-Perez, M.L. & Pineiro-Chousa, J. (2025). The ethical commitment of business strategy: ESG related factors as drivers of the SDGs. *Journal of Business Ethics*, <https://doi.org/10.1007/s10551-025-06002-z>

- Ma, Z. (2009). The status of contemporary business ethics research: Present and Future. *Journal of Business Ethics*, 90, 255 – 265. DOI 10.1007/s10551-010-0420-6
- Mayer, C., & Strine Jr., L.E. and Winter, J. (2020). 50 years later, Milton Friedman’s shareholder doctrine is dead, Fortune Media IP Limited, September 13, 2020.
- Merton RC. (1987). A simple model of capital market equilibrium with incomplete information. *Journal of Finance*, 42, 483–510. <https://doi.org/10.1111/j.1540-6261.1987.tb04565.x>
- Moss, J. (2017). The morality of divestment. *Law & Policy*, 39, 412 – 428.
- Norges Bank Investment Management (2014). 2013 Government Pension Fund Global annual report. Oslo. <https://doi.org/10.1111/lapo.12088>
- Ohlson, J., & Juettner-Nauroth, B. (2005). Expected EPS and EPS growth as determinants of value. *Review of Accounting Studies* 10, 349–65.
- Ohlson, J. (1995). Earnings, book value, and dividends in security valuation. *Contemporary Accounting Research*, 11, 661-687. <https://doi.org/10.1111/j.1911-3846.1995.tb00461.x>
- O’Neil, R.F. & Pienta, D.A. (1994). Economic criteria versus ethical criteria toward resolving a basic dilemma in business. *Journal of Business Ethics*, 13, 71 – 78. <https://www.jstor.org/stable/25072505>
- Otchere, I., Abdulrahman, A., & Wang, J. (2025.) ESG Investing and Sustainability of Pension Funds’ Assets: Evidence from the OECD countries. *Economic Modelling*, 143, 106948. <https://doi.org/10.1016/j.econmod.2024.106948>
- Park, S., & Gupta, S. (2012). Handling endogenous regressors by joint estimation using copulas. *Marketing Science*, 31, 567–586. <https://doi.org/10.1287/mksc.1120.0718>
- Rose, P. (2008) Sovereign wealth funds: Active or passive investors? *The Yale Law Journal Pocket*, 118, 104 – 108.
- Scott, B. (2016). ‘Ditching tobacco and arms does not make you an ethical investor’, The Guardian, Published 15th February 2016 05:00 GMT.
- Sison, A.J.G., Ferrero, I. & Guitian, G. (2019). Characterizing virtues in finance, *Journal of Business Ethics*, 155, 995 – 1007. DOI 10.1007/s10551-017-3596-1
- Spiller, R. (2000). Ethical business and investment: A Model for business and society. *Journal of Business Ethics*, 27, 149 – 160.
- The ESG Institute. (2024). Europe’s role as a global leader in ESG and the path forward: <https://www.linkedin.com/pulse/europes-role-global-leader-esg-path-forward-theesginstitute-zvhff/>
- Valentinov, V. (2023). Stakeholder theory: Toward a classical institutional economics perspective. *Journal of Business Ethics*, 188, 75 – 88. <https://doi.org/10.1007/s10551-022-05304-w>
- Waddock, S. A., & Graves, S. B. (1997). The corporate social performance-financial performance link. *Strategic Management Journal*, 18, 303–319. <http://www.jstor.org/stable/3088143>.

Table 1: Descriptive statistics and correlation Matrix

Panel A: Summary statistics of the test (excluded) firms

Variable(s)	No. of obs.	Mean	SD	Percentile Distribution			
				25%	50%	75%	95%
CoE	4,045	2.1485	1.7468	0.6208	2.0528	2.8266	6.1969
CTP	4,300	4.7496	2.5145	3.6638	5.3884	6.2314	10.2000
EP	3,724	0.4368	1.6686	0.0041	0.0369	0.2056	1.5582
OJN	3,196	0.8118	0.5352	0.4579	0.6854	1.0239	1.8817
SIZE	4,061	15.8122	1.7274	14.6909	15.9177	17.1306	18.3132
BM	3,958	0.7676	0.6673	0.3876	0.6369	0.9259	1.9608
LEV	4,506	0.6737	0.2704	0.5130	0.6834	0.8009	1.0642
BETA	3,985	0.8921	0.4880	0.5125	0.8508	1.2084	1.8553
RATING	3,432	2.3301	2.2559	1.0000	1.0000	2.0000	8.0000
GROWTH	3,992	0.1037	0.3097	-0.0373	0.0570	0.1710	0.5522
BOARD	3,836	12.1704	3.6202	9.2700	11.3300	14.4200	19.5700
BDIV	3,809	14.5271	11.7727	5.3389	14.5044	22.5533	33.8300
CEOSEP	2,840	0.4024	0.4946	0.0000	0.0000	1.0000	1.0000
CEO	2,833	0.9422	0.2454	1.0000	1.0000	1.0000	1.0000
EXCEO	2,841	0.3003	0.4103	0.0000	0.0000	1.0000	1.0000
BIND	2,841	0.6775	0.4509	0.0000	1.0000	1.0000	1.0000
DISP	2,815	0.1157	0.2241	0.0272	0.0781	0.1550	0.4504
INST	2,761	0.2836	0.3548	0.0000	0.0000	1.0000	1.0000
ILLIQ	3,432	0.0496	0.5432	0.0000	0.0002	0.0013	0.0484
TR	3,432	1.6148	2.5376	0.2682	0.7946	1.7596	5.2386
ROA	3,116	6.4257	6.7055	2.9315	5.0584	8.8201	19.8440
PVOL	3,432	0.0139	0.0089	0.0087	0.0132	0.0184	0.0292
SDROA	2,969	2.9276	4.7708	0.5898	1.4352	3.1569	11.0023
TQ	2,826	1.6401	1.2373	1.0215	1.2795	1.7937	3.6248
NINS	2,761	5.0715	1.3586	4.2773	5.2940	6.0703	7.1470
NANC	2,765	2.3332	0.6738	1.8366	2.4809	2.9531	3.3061

Panel B: Correlation matrix: Test firms

	CoE	CTP	EP	OJN	PostEX	NFAC	DISP	INST	ILLIQ	TR	SD ROA	TQ
CoE	1.000											
CTP	0.731	1.000										
EP	0.420	-0.095	1.000									
OJN	0.161	0.173	-0.334	1.000								
PostEX	0.116	0.156	0.104	0.130	1.000							
NFAC	-0.095	-0.042	-0.105	-0.053	-0.084	1.000						
DISP	-0.108	-0.127	-0.029	0.098	0.069	-0.049	1.000					
INST	-0.207	-0.234	-0.054	-0.171	-0.081	-0.045	-0.243	1.000				
ILLIQ	0.022	0.056	0.034	0.056	0.011	-0.078	0.078	-0.123	1.000			
TR	-0.032	-0.021	-0.042	-0.242	-0.105	-0.063	0.063	0.305	-0.063	1.000		
SDROA	0.133	0.114	-0.010	0.228	0.086	0.019	0.152	-0.067	0.095	0.238	1.000	
TQ	0.135	0.126	0.018	0.063	-0.162	0.108	-0.108	-0.054	-0.027	0.045	0.234	1.000

Table 2: Multivariate regression analysis

This table shows the baseline results of the exclusion effect on firm-level cost of capital. Column 1 exhibits the effect on the composite cost of equity (i.e., the equally weighted cost of equity estimated from the three models – Ohlson and Juttner-Nauroth (2005), Easton (2004), and Claus and Thomas (2001) models). The regression results in column 2 include the firm-level control variables, and column 3 presents the results of the full regression with firm-level and board characteristics. The variable definitions are given in Appendix A1. The standard errors are clustered at the firm level and reported in parentheses. The symbols ***, **, and * indicate statistical significance at the 1%, 5%, and 10% level, respectively.

Variables	(1) CoE	(2) CoE	(3) CoE
PostEX	0.9595*** (0.0810)	0.6127*** (0.0810)	0.3948*** (0.0993)
SIZE _{t-1}		-0.1294*** (0.0259)	-0.1603*** (0.0432)
BM _{t-1}		-0.0059 (0.0794)	-0.0267 (0.1052)
LEV _{t-1}		0.6123*** (0.1694)	0.5609** (0.2369)
BETA _{t-1}		0.2448*** (0.0758)	0.1757* (0.0978)
RATING _{t-1}		0.0355** (0.0150)	0.0386** (0.0181)
GROWTH _{t-1}		0.0781 (0.1680)	0.0196 (0.2257)
BOARD _{t-1}			0.0725*** (0.0158)
BDIV _{t-1}			0.0036 (0.0049)
CEOSEP _{t-1}			-0.2848** (0.1397)
CEO _{t-1}			-0.0201 (0.1960)
EXCEO _{t-1}			0.0881 (0.1466)
BIND _{t-1}			-0.2721** (0.1109)
Intercept	1.9228*** (0.0312)	1.4431*** (0.4208)	3.5543*** (0.7251)
Observations	3,365	2,895	2,795
Adj R ²	0.2401	0.2206	0.2406
Time FE	Yes	Yes	Yes
Firm FE	Yes	Yes	Yes
Clustered	Yes	Yes	Yes

Table 3: Heterogeneous effects

In this table, we report the heterogeneous effects of exclusion on capital cost based on the reasons for exclusions. Following the NGPF-G disclosures, we identified seven reasons for exclusion from the Fund's portfolio. We grouped these seven reasons into two, sector-based and norm-based exclusions. Column 1 shows their comparative effect. Columns 2 to 8 display the results for each of the seven categories of exclusion on the cost of capital. The variable definitions, including the seven categories of reasons for exclusion, are presented in Appendix A1. The standard errors are clustered at the firm level and reported in parentheses. The symbols ***, **, and * indicate statistical significance at the 1%, 5%, and 10% level, respectively.

Variables	(1) CoE	(2) CoE	(3) CoE	(4) CoE	(5) CoE	(6) CoE	(7) CoE	(8) CoE
PostEX	-1.0119*** (0.3278)	0.3653*** (0.1053)	0.3077** (0.1499)	0.4371*** (0.1015)	0.3666*** (0.1084)	0.4379*** (0.1016)	0.4863*** (0.1101)	0.4078*** (0.0998)
NormDummy	-0.6761*** (0.2590)							
PostEX*NormDummy	1.6672*** (0.3596)							
SED		0.2359** (0.1056)						
PostEX*SED		0.4847** (0.2007)						
CP			-0.1397 (0.1646)					
PostEX*CP			0.4769** (0.2296)					
SVHR				-0.5873 (0.4154)				
PostEX*SVHR				-0.2710 (0.4571)				
PTOBA					0.7516** (0.3187)			
PostEX*PTOBA					0.4658 (0.3595)			
GCorrupt						0.7358***		

						(0.2644)		
PostEX*GCorrupt						1.7112**		
						(0.7702)		
PNW							-0.2636	
							(0.2015)	
PostEX*PNW							-0.3531	
							(0.2475)	
OTHER								-2.4835***
								(0.2028)
PostEX*OTHER								0.0309
								(0.2678)
Intercept	4.2490***	3.6329***	2.6974***	3.3776***	3.3188***	3.7440***	3.2401***	3.5238***
	(0.7828)	(0.6899)	(0.9189)	(0.6756)	(0.6830)	(0.6897)	(0.6928)	(0.6807)
Observations	2,795	2,795	2,795	2,795	2,795	2,795	2,795	2,795
Adj R ²	0.0709	0.2380	0.2466	0.2359	0.2413	0.2418	0.2417	0.2459
Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Time FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Firm FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Clustered	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Table 4: Channel through which exclusions affect CoE

The table presents regression results of the channels through which exclusion affects COE. Panel A reports results that show the effects of exclusions on the information proxies. Columns 1 and 2 report the impact of exclusion on institutional investor holdings and turnover ratio. Columns 3, 4, and 5 show the effects on analyst forecast dispersion, Amihud (2002) illiquidity, and standard deviation of ROA, respectively. Panel B contains regression results that show how these variables affect the cost of equity capital after exclusion. The variable definitions are given in Appendix A1. The standard errors are clustered at the firm level and reported in parentheses. The symbols ***, **, and * indicate significance at 1%, 5%, and 10%, respectively.

Panel A: Analysis of the effects of exclusions on the information proxies

Variables	(1) INST	(2) TR	(3) DISP	(4) ILLIQ	(5) SDROA
PostEX	-0.0596*** (0.0225)	-0.3413*** (0.1066)	0.0527*** (0.0135)	0.0143** (0.0071)	0.4580** (0.1839)
Intercept	0.1582 (0.1330)	0.8108 (0.5779)	0.0840 (0.0805)	1.5745** (0.7919)	7.2706*** (1.5023)
Observations	2485	3175	1562	3175	2541
Adj R ²	0.4365	0.0784	0.0322	0.0760	0.0803
Controls	Yes	Yes	Yes	Yes	Yes
Time FE	Yes	Yes	Yes	Yes	Yes
Firm FE	Yes	Yes	Yes	Yes	Yes
Clustered	Yes	Yes	Yes	Yes	Yes

Panel B: Analysis of changes in information variables on CoE

Variables	Analysts	INST	ILLIQ	Combined
PostEX	0.2877** (0.1304)	0.3987*** (0.1534)	0.3718*** (0.0995)	0.2814** (0.1288)
NFAC	-0.0772*** (0.0084)			-0.0398** (0.0180)
PostEX*NFAC	-0.0821*** (0.0132)			-0.0487*** (0.0109)
DISP	0.3304*** (0.0942)			0.4877*** (0.1426)
PostEX*DISP	0.3699*** (0.1116)			0.5494** (0.2499)
INST		-0.3509** (0.1584)		-0.4684** (0.2351)
PostEX*INST		-0.1916* (0.1095)		-0.2072** (0.0935)
ILLIQ			69.9261*** (12.1576)	7.6366*** (1.3746)
PostEX*ILLIQ			-32.7825 (21.3808)	5.8222*** (1.3880)
Intercept	2.7231*** (0.6698)	3.4312*** (0.6400)	2.9472*** (0.6813)	-1.6336*** (0.4973)
Observations	2,672	2,465	2,795	2,605
Adj R ²	0.2062	0.0858	0.2523	0.0998
Controls	Yes	Yes	Yes	Yes
Time & Firm FE	Yes	Yes	Yes	Yes
Clustered	Yes	Yes	Yes	Yes

Table 5: High environmental risk awareness, ESG score, and EU dummy

This table reports the effects of exclusion on the cost of equity in countries with different climate risk awareness. Column 1 shows the impact of exclusion on targeted firms from countries with high and low ESG awareness scores based on Gallup Analytics surveys. Column 2 presents similar results for excluded firms in countries with high ESG scores, and column 3 shows the comparative effect of exclusion on firms from EU versus non-EU countries. The variable definitions are given in Appendix A1. The standard errors are clustered at the firm level and reported in parentheses. The symbols ***, **, and * indicate statistical significance at the 1%, 5%, and 10% level, respectively.

Variables	(1) CoE	(2) CoE	(3) CoE
PostEX	0.6326*** (0.1165)	0.3112** (0.1493)	0.4665*** (0.1095)
HAW	-0.3970*** (0.1402)		
PostEX*HAW	0.6151*** (0.2038)		
ESGSC		-0.2727** (0.1281)	
PostEX*ESGSC		0.2770** (0.1198)	
EU			-0.2107 (0.1456)
PostEX*EU			0.3738** (0.1483)
Intercept	3.1200*** (0.6882)	3.7549*** (0.6602)	3.3609*** (0.6749)
Observations	2,648	2,795	2,648
Adj R ²	0.0612	0.0632	0.0584
Controls	Yes	Yes	Yes
Time FE	Yes	Yes	Yes
Firm FE	Yes	Yes	Yes
Clustered	Yes	Yes	Yes

Table 6: Exclusion and firm value

This table reports the regression results showing the effects of exclusion on firm value (Tobin's Q). The left panel contains the level regression results, while the right panel exhibits the change regression results. The variable definitions are presented in Appendix A1. The standard errors are clustered at the firm level and reported in parentheses. The symbols ***, **, and * indicate statistical significance at the 1%, 5%, and 10% level, respectively.

Variables	(1) TQ	(2) TQ	Variables	(3) Δ_3 TQ	(4) Δ_3 TQ
PostEX	-0.3659*** (0.1049)	-0.3779*** (0.0963)			
CoE	-0.0841*** (0.0161)	-0.0761*** (0.0159)	Δ_3 CoE	-0.0425** (0.0209)	-0.0420** (0.0210)
PostEX* CoE	-0.1555*** (0.0255)	-0.1623*** (0.0238)			
ROAB	8.1339*** (0.4687)		Δ_3 ROAB	0.1732*** (0.0571)	
ROAA		9.2883*** (0.4788)	Δ_3 ROAA		0.1970** (0.0794)
Intercept	3.0294*** (0.3863)	3.1202*** (0.3710)	Intercept	-0.0532** (0.0220)	-0.0413** (0.0174)
Controls	Yes	Yes	Controls	Yes	Yes
Observations	2,790	2,790	Observations	1055	1055
Adj R ²	0.5843	0.6197	Adj R ²	0.9096	0.8682
Time FE	Yes	Yes	Time FE	Yes	Yes
Firm FE	Yes	Yes	Industry FE	Yes	Yes
Clustered	Yes	Yes	Clustered	Yes	Yes

Table 7: Propensity score matching

The table presents results of regressions that examine the effects of exclusion on the cost of equity of the test group and two control samples. Control sample 1 includes firms that are in the NGPF-G portfolio and Control sample 2 consist of firms from the same country as the excluded firms. Column 1 shows the results of the regression that uses the combined control sample. The results in column 2 are for the test sample and control sample 1 and column 3 contains results of the regression for the test firm and control sample 2. The standard errors are clustered at the firm level and reported in parentheses. The symbols ***, **, and * indicate statistical significance at the 1%, 5%, and 10% level, respectively.

	(1) Both control samples	(2): Control sample 1	(3) Control sample 2
Variables	CoE	CoE	CoE
PostEX	0.2826*** (0.0821)	0.3246*** (0.0849)	0.2898*** (0.0892)
EXCL	0.1334*** (0.0456)	0.1585*** (0.0595)	0.1195** (0.0548)
PostEX*EXCL	0.2563*** (0.0846)	0.2893*** (0.0958)	0.2249** (0.1043)
SIZE _{t-1}	-0.1042*** (0.0297)	-0.1888*** (0.0351)	-0.1264*** (0.0363)
BM _{t-1}	-0.0554 (0.0983)	0.0824 (0.1075)	-0.0355 (0.1040)
LEV _{t-1}	0.6001*** (0.1658)	0.5653*** (0.1923)	0.6431*** (0.1897)
BETA _{t-1}	0.1274* (0.0678)	0.1814** (0.0754)	0.1002 (0.0790)
RATING _{t-1}	0.0344** (0.0135)	0.0190 (0.0163)	0.0202 (0.0171)
GROWTH _{t-1}	-0.0576 (0.1774)	0.0418 (0.2037)	-0.1090 (0.2032)
BOARD _{t-1}	0.0335*** (0.0108)	0.0449*** (0.0119)	0.0534*** (0.0135)
BDIV _{t-1}	0.0086*** (0.0030)	0.0099*** (0.0034)	0.0044 (0.0035)
CEOSEP _{t-1}	-0.4981*** (0.1006)	-0.4005*** (0.1180)	-0.4696*** (0.1152)
CEO _{t-1}	-0.1038 (0.1441)	-0.0696 (0.1518)	-0.1103 (0.1923)
EXCEO _{t-1}	0.2767*** (0.1004)	0.2401** (0.1169)	0.2023* (0.1174)
BIND _{t-1}	-0.1459** (0.0700)	-0.2579*** (0.0824)	-0.1278 (0.0875)
Intercept	3.0873*** (0.4519)	3.2596*** (0.5217)	3.4511*** (0.5791)
Observations	5,205	4,546	4,369
Adj R ²	0.2683	0.2226	0.1775
Time FE	Yes	Yes	Yes
Firm FE	Yes	Yes	Yes
Clustered	Yes	Yes	Yes

Table 8: Robustness tests

This table shows the effects of the exclusion on the individual cost of equity metrics. The results in column 1 use the Claus and Thomas's (2001) measure. Columns 2 and 3 present the effect on the cost of equity estimated using Easton (2004) and Ohlson and Juttner-Nauroth's (2005) models, respectively. The variable definitions are given in Appendix A1. The standard errors are clustered at the firm level and reported in parentheses. The symbols ***, **, and * indicate statistical significance at the 1%, 5%, and 10% level, respectively.

Variables	(1) CTP	(2) EP	(3) OJN
PostEX	0.3043*** (0.0595)	0.0928*** (0.0151)	0.1373*** (0.0402)
SIZE _{t-1}	-0.5292*** (0.0647)	-0.1360** (0.0643)	-0.0332** (0.0136)
BM _{t-1}	-1.0951*** (0.1619)	-0.1354 (0.1050)	-0.0906 (0.0661)
LEV _{t-1}	0.9462*** (0.3024)	0.4091* (0.2359)	0.1250** (0.0605)
BETA _{t-1}	0.5833*** (0.1356)	-0.3406** (0.1278)	0.1584*** (0.0327)
RATING _{t-1}	0.0209 (0.0278)	0.0178 (0.0231)	0.0003 (0.0082)
GROWTH _{t-1}	0.3140 (0.3701)	-0.5703*** (0.1946)	0.2711*** (0.0985)
BOARD _{t-1}	0.1286*** (0.0190)	0.0063 (0.0154)	0.0064 (0.0054)
BDIV _{t-1}	0.0112 (0.0079)	-0.0017 (0.0055)	0.0056*** (0.0018)
CEOSEP _{t-1}	-0.5692** (0.2490)	-0.3011** (0.1480)	-0.1841*** (0.0429)
CEO _{t-1}	-0.2100 (0.3038)	-0.0329 (0.2088)	-0.1045 (0.0659)
EXCEO _{t-1}	0.2429 (0.2680)	0.1611 (0.1648)	0.0639 (0.0483)
BIND _{t-1}	-0.4722*** (0.1366)	-0.1361 (0.1371)	-0.0173 (0.0461)
Intercept	9.4382*** (1.2361)	-1.6455* (0.9202)	2.0724*** (0.1933)
Observations	3,514	2382	2156
Adj R ²	0.2615	0.2120	0.1952
Time FE	Yes	Yes	Yes
Firm FE	Yes	Yes	Yes
Clustered	Yes	Yes	Yes

Table 9: Robustness and endogeneity test

This table presents the results of several robustness tests to address potential endogeneity, and omitted variables bias in estimating the effect of exclusion on the cost of equity. Columns 1 to 7 include various explanatory variables, namely, the number of institutional investors, the number of analysts following the firm, ownership concentration ratio, analyst forecast error, CEO compensation, country-level financial development index, and GDP per capita. To address endogeneity and reverse causality concerns, we run Lewbel's (2012) instrument-based control function Gaussian Copula (GC-IV Lewbel and dynamic panel GMM regressions in columns 8 and 9, respectively. In column 8, we run the Sargan overidentification test using the excluded Lewbel instruments (homoscedasticity-based $J = n.R^2$ of residuals on instrument). The J -value is 5.84 with a p -value of 0.512, suggesting that the overidentifying restrictions are consistent with the model. In column (9), the AR (2) test of second-order serial correlation is 0.41, and the p -value of the Sargan test for overidentifying restriction under the null of valid instruments is 0.264. The variable definitions are given in Appendix A1. The standard errors are clustered at the firm level and reported in parentheses. The symbols ***, **, and * indicate statistical significance at the 1%, 5%, and 10% level, respectively.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8) GC-IV (Lewbel CF) CoE	(9) GMM CoE
Variables	CoE	CoE	CoE	CoE	CoE	CoE	CoE		
PostEX	0.2874*** (0.0869)	0.5469*** (0.0937)	0.3130*** (0.0889)	0.4396*** (0.0968)	0.5814*** (0.1045)	0.5723*** (0.0976)	0.4000*** (0.0880)	0.4490*** (0.1351)	0.2787*** (0.0984)
NINS	-0.4429*** (0.0811)								
NANC		-0.2837*** (0.1092)							
HERF			-0.5478 (1.4599)						
STDAF				-0.0004** (0.0002)					
EXCOM					-0.0863*** (0.0221)				
FDIN						-1.8438*** (0.3142)			
GDPPC							0.0012*** (0.0001)		
GC-Control PostEX								-0.1084	

CoE _{t-1}								(0.4046)	0.4003*** (0.0605)
Constant	2.2390*** (0.6638)	2.9603*** (0.6690)	2.9963*** (0.6299)	3.1968*** (0.7392)	4.2131*** (0.8322)	3.2834*** (0.6346)	3.2236*** (0.8116)	2.9101*** (0.8231)	2.4263*** (0.8039)
Observations	2,665	2,750	2,665	2,752	2,585	2,795	2,795	2,795	2,674
Adj R ²	0.1560	0.2465	0.1312	0.2686	0.2490	0.2806	0.2851	0.3460	
Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Time FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Firm FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No
Clustered	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Figure 1: Reasons for exclusion from the NGPF-G

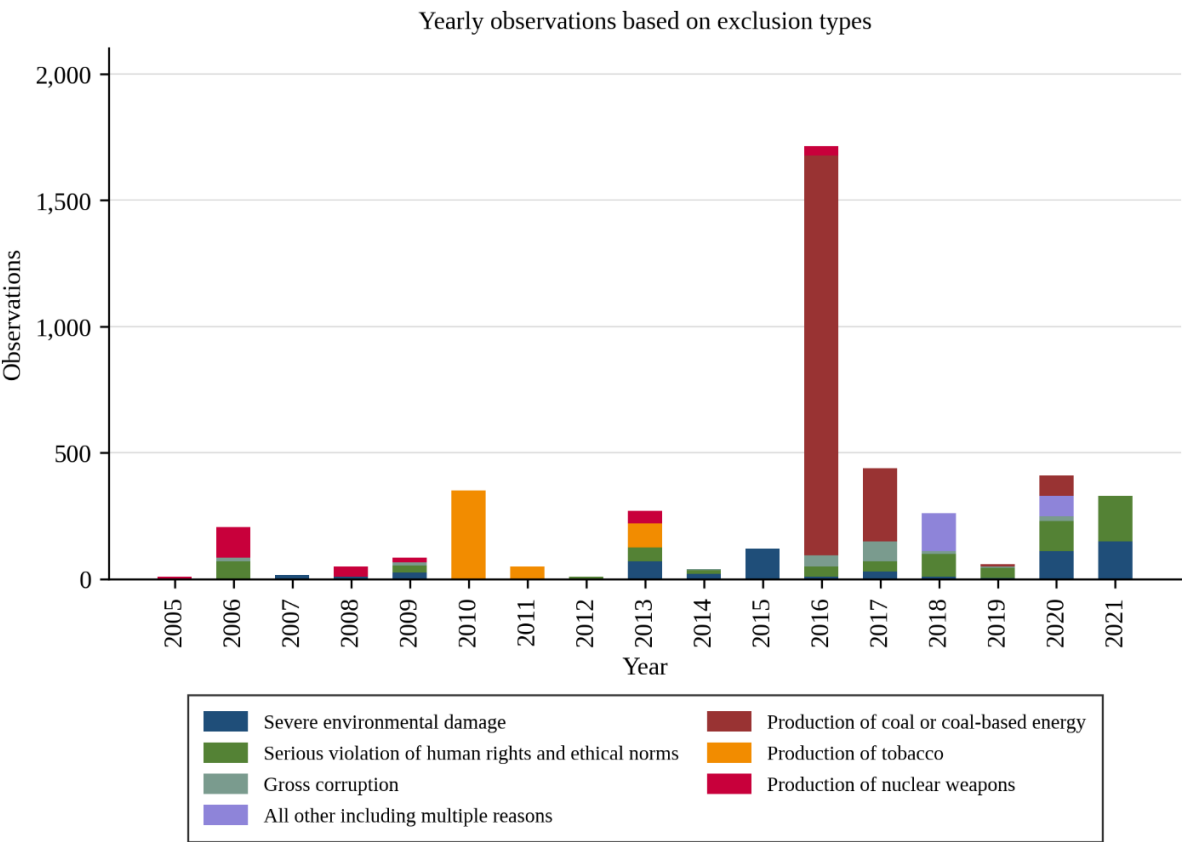


Figure 2: Boxplot distribution of average cost of equity for excluded firms over the pre- and post-exclusion periods

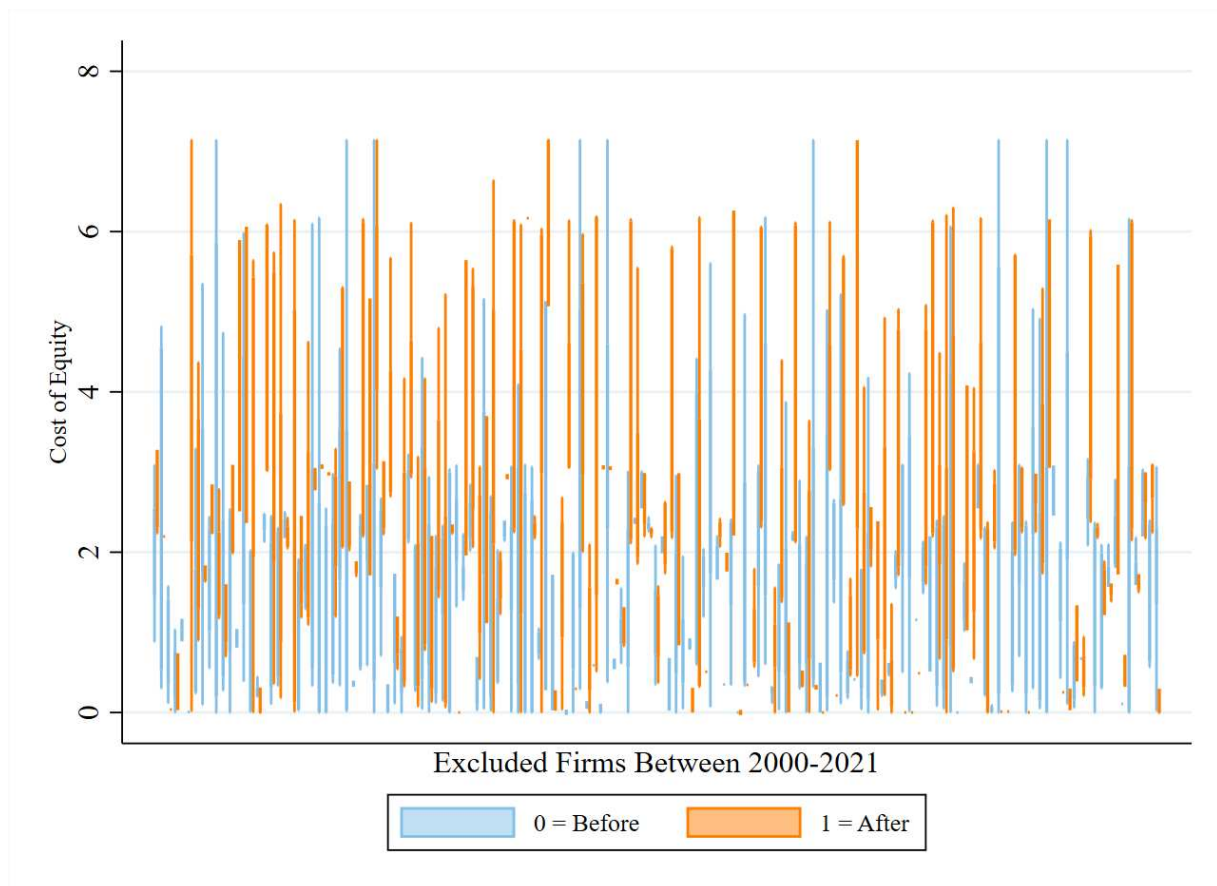


Figure 3: Plots of the interaction/moderating effects:

Figure 3a presents the predicted values of cost of equity are plotted at -1 standard deviation, the mean, and $+1$ standard deviation of the moderator – Gallup’s high environmental awareness score (HAW). Following Murphy and Aguinis (2022), the full range of the dependent variable is displayed to avoid visual distortion.

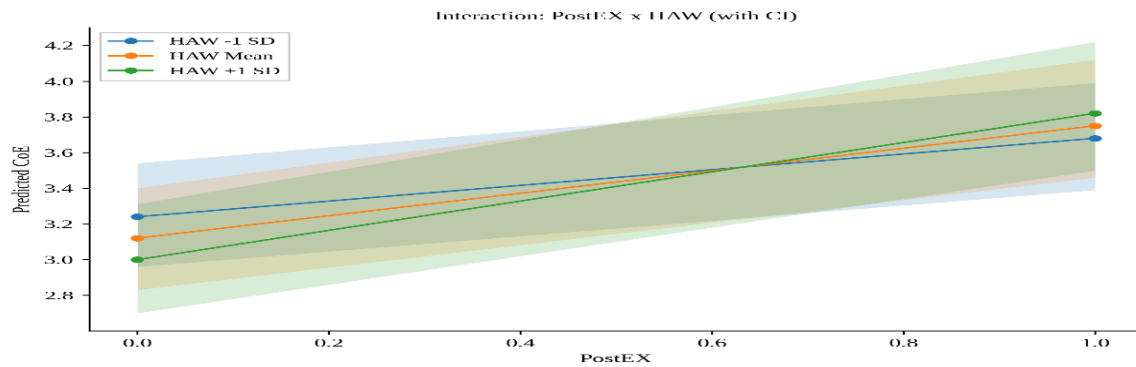


Figure 3b exhibits the predicted values of cost of equity are plotted at -1 standard deviation, the mean, and $+1$ standard deviation of the moderator – country-level ESG scores (ESGSC). Following Murphy and Aguinis (2022), the full range of the dependent variable is displayed to avoid visual distortion.

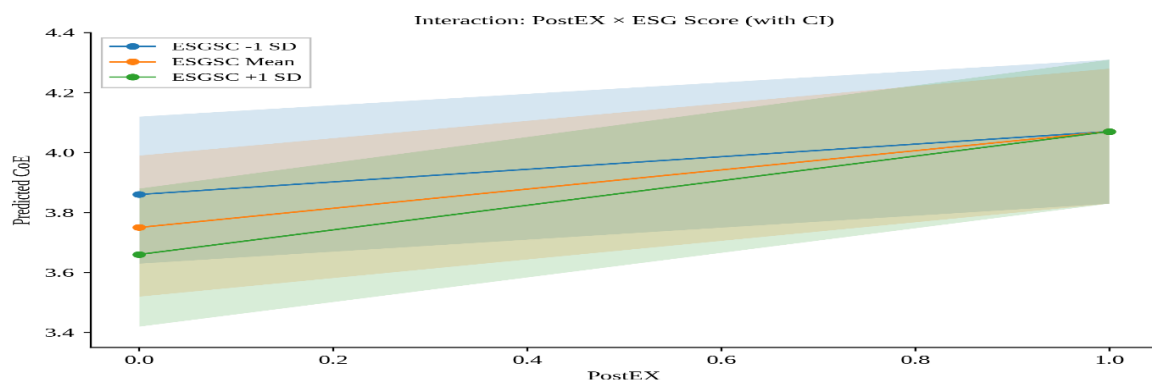
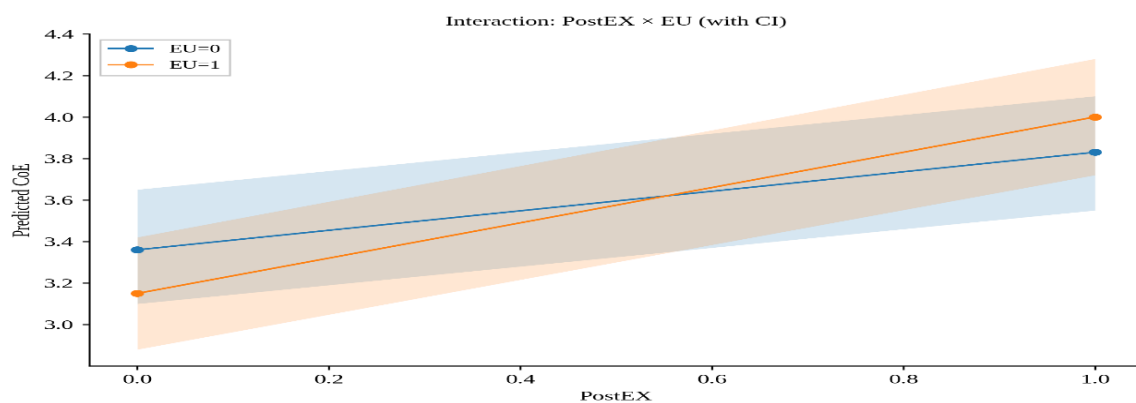


Figure 3c shows the predicted values are plotted separately for EU and non-EU firms to illustrate the moderating effect of institutional context.



Appendix A1: List of variables and data sources

Variables	Definitions	Sources
$feps_{t+\tau}$	Forecasted earnings per share for year $t+\tau$	I/B/E/S
$fdps_{t+\tau}$	Forecasted dividend per share for year $t+\tau$	As above
eps_0	Actual earnings per share $t-1$	As above
dps_0	Actual dividend per share $t-1$	As above
$bvps_t$	Book value per share at the beginning of year t	As above
ltg	Average long-term growth forecast reported for year t	As above
$price_t$	The market price of share or stock at the end of year t	Refinitiv
$bondy_t$	Yield on a 10-year Treasury Bond in year t	As above
OJN	The implied equity premium is defined as the cost of equity derived from the Ohlson and Juttner-Nauroth (2005) model estimated for each year minus the rate on a 10-year Treasury bond.	Authors' calculations based on I/B/E/S data
EP	The implied cost of equity premium is defined as the cost of equity derived from the Easton (2004) model estimated each year minus the rate on a 10-year Treasury bond.	As above
CTP	The implied cost of equity is defined as the cost of equity derived from the Claus and Thomas (2001) model estimated for each year minus the rate on a 10-year Treasury bond.	As above
CoE	The average implied cost of equity premium is defined as the cost of equity derived from the average value of Ohlson and Juttner-Nauroth (2005), Easton (2004), and Claus and Thomas (2001). We express it as a percentage.	As above
PostEX	Post-exclusion dummy from the year it had been excluded.	Authors' calculations based on NGPF-G data
ExType	Exclusion criterion, where we grouped them into seven primary categories and used a dummy variable 1 for each of the categories and 0 otherwise. The categories are severe environmental damage, production of coal or coal-based energy, production of tobacco, a serious violation of human rights and individuals' rights, gross corruption, production of nuclear weapons, ammunition, and production of cluster munitions, and other reasons, including being excluded due to more than one reason.	As above
RecentDum	Dummy 1 for firms excluded in the second half of the year	As above
inNGPF	Control firms which are still in the NGPF-G portfolio	Authors' calculations based on NGPFG data

		and propensity score-matching approach (PSM)
notNGPF	Control firms outside NGPF-G	As above
EXCL	Dummy 1 for test firms and 0 for control	As above
SIZE	Firm size measured as log (total assets +1)	Authors' calculations based on Refinitiv data
BM	Book-to-market value ratio	As above
LEV	The leverage ratio is measured as Total Debt/Total Equity	As above
GROWTH	Growth rate measured as annual growth in total sales	As above
BETA	Firms' historical Beta	Refinitiv
RATING	Firm-level credit rating	As above
BOARD	Size of the board	As above
BDIV	Board diversity	As above
CEOSEP	Separation of CEO and Chair of the board	As above
CEO	CEO is the board member	As above
EXCEO	Chair was the ex-CEO	As above
BIND	Board independence	As above
ROA	Return on assets	As above
ESGSC	Country-level ESG score	As above
NFAC	The average number of financial analysts covering the firms is based on the number of analysts' earnings forecasts.	Authors' calculations based on I/B/E/S data
DISP	Dispersion of analyst forecasts is defined as the standard deviation of the analysts' annual earnings per share (EPS) forecasts for the fiscal year t divided by their average EPS forecast.	As above
INST	Total institutional ownership ratio-value of institutional ownership as a percentage of market capitalisation.	As above
NINS	Log of number of institutional investors + 1	As above
NANC	Log of number of analyst coverage + 1	As above
HERF	Ownership concentration ratio – Herfindahl-Hirschman index	As above
Mean	Average of analysts' earnings forecast	As above

STDAF	The standard deviation of analysts' earnings forecast	As above
ILLIQ	Amihud's (2002) illiquidity ratio	Authors' calculations based on Refinitiv data
TR	The turnover rate of liquidity	As above
SDROA	Past volatility of return on assets	As above
DPRICE	Stock price – Yearly average of the monthly mean of daily price	As above
PVOL	Stock volatility – Yearly average of the monthly mean of daily volatility	As above
EPSABS	Absolute changes in earnings per share	As above
RND	R&D intensity is measured as Research & Development Expenses/Total sales revenue	As above
ROAB	Adjusted ROA using operating income before depreciation	As above
ROAA	Adjusted ROA using operating income after depreciation	As above
TQ	Tobin's Q (market capitalisation + total liabilities)/total assets at the beginning of the period	As above
CAPEX	Capital expenditure adjusted with lagged total assets	As above
EXCOM	Total senior executive compensation divided by total revenue	As above
CR19	Climate Risk Awareness Survey of 2019	Gallup Survey
CRA	Average of Climate Risk Awareness Survey of 2008, 2010, and 2019	Authors' calculations based on the Gallup Survey
HAW	High awareness dummies equal to 1 if CRA of an excluded firm's country is greater than the median of the aggregate average score	As above
FDIN	Country-level financial development index	International Monetary Fund (IMF)
GDPPC	Log of GDP per capita in US dollars	World Bank

Appendix A2: Implied Cost of Equity Capital (overview and model-specific assumptions)

Following earlier studies, such as Ghoul et al. (2011) and Hail and Leuz (2006), our models require firms to have positive one-year-ahead ($feps_{t+1}$) and two-year-ahead ($feps_{t+2}$) earnings forecasts, and a long-term growth forecast (ltg) for numerical solutions.

Model 1: Ohlson and Juetter-Nauroth (2005)

The valuation equation is given by:

$$r_{OJ} = B + \sqrt{B^2 + \frac{feps_{t+1}}{P_t}(g_2 - (\gamma - 1))} \quad (A.2.1)$$

$$B = \frac{1}{2} \left((\gamma - 1) + \frac{dps_{t+1}}{P_t} \right)$$

$$dps_{t+1} = dps_0$$

$$g_2 = \frac{stg + ltg}{2}$$

$$stg = \frac{feps_{t+2} - feps_{t+1}}{feps_{t+1}}, \text{ and}$$

$$(\gamma - 1) = bondy_t - 0.03$$

This is a generalisation of the Gordon constant growth model (Ghoul et al., 2011). The model uses one-year-ahead forecasted earnings, dividend per share, and short- and long-term growth to impute the share price. The dividend per share is assumed to be constant, and long-term growth equals the expected inflation rate. To estimate the short-term growth rate, we follow Gode and Mohanram's (2003) approach: stg is the average percentage change between $t+1$ to $t+2$ earnings forecast and the five-year I/B/E/S growth forecast.

Model 2: Easton (2004)

The valuation equation is given by:

$$P_t = \frac{feps_{t+2} + r_{ES}dps_{t+1} - feps_{t+1}}{r_{ES}^2} \quad (A.2.2)$$

$$dps_{t+1} = dps_0$$

This model is based on Ohlson and Juettner-Nauroth's (2005) valuation approach and considers it as a generalisation of the Price-Earnings-Growth (PEG) model. The share price is expressed as a one-year-ahead and two-year-ahead earnings forecast plus the expected dividend per share. Therefore, the explicit forecast horizon is set to two years and assumes that forecasted abnormal earnings will grow at a constant rate afterwards. The dividend per share is assumed to be constant.

Model 3: Claus and Thomas (2001)

We can present the valuation equation by:

$$P_t = A_t + \sum_{\tau=1}^T \frac{be_{t+\tau}}{(1+r_{ct})} + \frac{be_{t+5}(1+g)}{(r_{ct}-g)(1+r_{ct})^T} \quad (A.2.3)$$

$$be_{t+\tau} = feps_{t+\tau} + r_{ct}A_{t+\tau-1}$$

$$A_{t+\tau} = A_{t+\tau-1} + feps_{t+\tau}(1 - DPR_{t+\tau})$$

$$DPR_{t+\tau} = 0.5$$

$$g = bondy_t - 0.03$$

This model is a special case of the residual income valuation model following the clean surplus accounting (Ohlson, 1995) assumption; that is, share prices are imputed from forecasted earnings, book value, and dividends. In our estimation, the dividend pay-out is assumed to be constant at 50% (Ghoul et al., 2011), and, from the fifth year, the residual income is assumed to grow at the expected inflation rate.

Appendix A3: Sample distributions – based on country of headquarters

Country of headquarters	Firm-years of the total sample		Firm-years of excluded firms	
	Frequency	Percentage	Frequency	Percentage
Australia	500	3.12	125	2.73
Brazil	525	3.27	150	3.28
Canada	800	4.98	200	4.37
Chile	200	1.25	50	1.09
China	1,350	8.41	400	8.74
Czech Republic	100	0.62	50	1.09
France	200	1.25	50	1.09
Germany	100	0.62	25	0.55
Greece	75	0.47	25	0.55
Hong Kong	900	5.61	250	5.46
India	1,325	8.26	350	7.65
Indonesia	125	0.78	50	1.09
Ireland	25	0.16	25	0.55
Israel	750	4.67	200	4.37
Italy	25	0.16	25	0.55
Japan	825	5.14	250	5.46
Malaysia	725	4.52	175	3.83
Mexico	200	1.25	50	1.09
Peru	75	0.47	25	0.55
Philippines	200	1.25	50	1.09
Poland	400	2.49	100	2.19
Portugal	25	0.16	25	0.55
Russia	100	0.62	25	0.55
South Africa	125	0.78	50	1.09
South Korea	700	4.36	250	5.46
Spain	25	0.16	25	0.55
Sweden	100	0.62	25	0.55
Switzerland	100	0.62	25	0.55
Taiwan	300	1.87	100	2.19
Thailand	325	2.02	100	2.19
United Kingdom	725	4.52	150	3.28
United States	4,100	25.55	1,175	25.68
Total	16,050	100	4,575	100

Note: We use the propensity score-matching (PSM) approach to select the control sample of firms from the NGPF-G portfolio as well as from the same country as the excluded firms.

Appendix A4: Recency effects of exclusion on cost of equity

This table presents regression results showing the recency effects of exclusion on the cost of equity. Our key variable, RecentDum, takes a value of 1 for the latter half of the study period, and 0 for the earlier half. The variable definitions are given in Appendix A1. The standard errors are clustered at the firm level and reported in parentheses. The symbols ***, **, and * indicate statistical significance at the 1%, 5%, and 10% level, respectively.

Variables	(1) CoE	(2) CoE	(3) CoE	(4) CoE
PostEX	0.2858** (0.1219)	0.4129*** (0.1109)	0.2593* (0.1396)	0.3341*** (0.1144)
RecentDum	0.1864* (0.1125)	0.3274*** (0.1100)	0.2325** (0.1154)	0.2620** (0.1266)
PostEX*RecentDum	0.7507*** (0.2050)			
HAW		-0.3087** (0.1541)		
PostEX*RecentDum*HAW		0.4128* (0.2116)		
ESGSC			-0.1278** (0.0575)	
PostEX*RecentDum*ESGSC			0.1283** (0.0644)	
EU				-0.1060 (0.0903)
PostEX*RecentDum*EU				0.1506* (0.0773)
Intercept	3.4403*** (0.6744)	3.0705*** (0.7172)	3.3884*** (0.7239)	3.2671*** (0.7119)
Observations	2,795	2,795	2,795	2,795
Adj R ²	0.0673	0.0688	0.0634	0.0732
Yes	Yes	Yes	Yes	Yes
Time FE	Yes	Yes	Yes	Yes
Firm FE	Yes	Yes	Yes	Yes
Clustered	Yes	Yes	Yes	Yes