



Business strategy heterogeneity and ESG disclosure[☆]

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ABSTRACT

Our study investigates the influence of business strategy heterogeneity on corporate sustainability, measured by the Bloomberg ESG disclosure scores. Using a dataset of 6,976 observations from U.S. non-financial firms over the 2005–2019 period, we find a significant negative relationship between firms adopting a prospector strategy and their ESG disclosure scores. Firms emphasizing aggressive growth, innovation, and risk-taking tend to have lower ESG scores compared to those with defender and analyzer strategies. Further, the negative association between a prospector strategy and ESG scores intensifies under weaker information and governance frameworks and during periods of increased uncertainty. As COP28 promotes global collaboration on climate action, this study highlights the need for businesses to realign their strategies with the global sustainability agenda.

“The SDGs must become the DNA of business strategy and management”

- Navid Hanif -

The UN DESA's Assistant-Secretary-General for Economic Development

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1. Introduction

In 2019, the influential Business Roundtable group of U.S. CEOs, which has asserted shareholder primacy since its inception in the 1970s, agreed to redefine the corporate purpose to include a broader constituency.¹ Alex Gorsky, Chairman of the Board and Chief Executive Officer of Johnson & Johnson, and Chair of the Business Roundtable Corporate Governance Committee, introduced the statement on the Business Roundtable website saying “**This new statement better reflects the way corporations can and should operate today**” and further commented that “**It affirms the essential role corporations can play in improving our society when CEOs are truly committed to meeting the needs of all stakeholders.**” Our study is motivated by this statement. Through an agency lens, we seek to understand how different approaches to business strategy (or strategic archetypes) affect corporate pursuit of ESG objectives.

After classifying our sample firms using the typology of business strategy developed by Miles et al. (1978) and Miles and Snow (2003) according to their strategic archetype (prospector, defender or analyzer), we then examine how firms following different types of business strategy engage with ESG disclosure. In particular, we ask does the prospector strategy result in lower engagement with sustainability objectives? In the context of the global efforts aimed at sustainable development, particularly in light of the United Nations Climate Change Conference (COP28),²³ and the pursuit of the Sustainable Development Goals (SDGs), our results are of paramount significance as part of the academic contribution in guiding companies during the climate transition.⁴

According to organizational theorists, the strategies employed by firms competing within an industry display distinctive characteristics. Amongst the most prominent classification systems is the typology provided by Miles et al. (1978) and Miles and Snow (1978, 2003) who classify strategic competitors into three main profiles – Defenders, Analyzers and Prospectors. Defenders base their strategic approach on the stability of operations and follow low cost and efficiency-based methods of value creation. Such firms would seek to operate in familiar product-market environments and with limited exposure to risk. At the other end of the spectrum are the Prospector firms. These firms are more innovative and growth-oriented. Prospectors seek out business opportunities in new product-market markets, often at much a higher level of risk than other archetypal approaches. The Prospector approach is consistent with higher complexity, more frequent adjustment to internal control mechanisms, and higher levels of volatility of operating and financial performance. Given that companies follow different archetypes of strategic behavior (Bentley et al., 2013; Miles et al., 1978), we investigate whether heterogeneity in business strategies results in differential engagement with ESG objectives, as measured using a standard ESG disclosure rating system.

Under the assumption that markets and investors would like companies to pursue ESG objectives, we can test whether different strategic archetypes are associated with different levels of ESG disclosure. A defender firm’s activities can reasonably be assumed to be more measurable, observable and less subject to moral hazard than prospector firms (Jensen & Meckling, 1976). If such a problem exists, then it will manifest in the differences between ESG engagement between the different strategic archetypes. The defender strategy is much more transparent and activities are much more predictable. Such firms may be defensive and be more focused on established activities. On the other hand, if the business strategy requires high degrees of flexibility or innovative activities, which are uncertain, unpredictable or can be obfuscated then the company will be subject to less to stakeholder criticism. Such firms, i.e., prospector firms might be less transparent, be able to be less responsive to ESG disclosure scores and be at liberty to prioritize the wealth objective. Further, the pursuit of environmental, social and governance goals combines a plethora of objectives which may require trade-offs with the traditional more short-term objective of SWM. We argue that followers of the prospector strategy are fundamentally aligned with a more unrestrained pursuit of the wealth objective. Given the congruence between the prospector approach and the wealth objective, we conjecture that the sustainability performance of such firms will be lower than firms whose overriding objective is more consistent with societal goals.

To perform our study, we use a sample of ESG disclosure scores provided by Bloomberg for U.S. non-financial firms between 2005 and 2019. For our measure of ESG disclosure, we select the Bloomberg ESG disclosure for several reasons. First, Bloomberg is one of the world’s foremost providers of financial information used by investors. These scores are designed to provide their clients with appropriate ESG data for investment decision-making. Second, Bloomberg scores are a composite ratings system which incorporates information from a range of providers including MSCI and Sustainalytics as well as company reports. Bloomberg Professional Services provide a detailed explanation of the methodology which includes a materiality map in the Bloomberg platform and attempt to control for greenwashing using published frameworks such as the EU Taxonomy and Sustainable Finance Disclosure Regulation (SFDR).⁵ Third, the studies mentioned above do not include Bloomberg disclosure scores.

Our findings show that prospector firms have significantly lower ESG disclosure scores in general and when scores are decomposed into separate categories of environmental, Social, and Governance after controlling for a variety of company specific controls, governance and information environment controls and industry and year fixed effects. The results are robust to the use of firm fixed

¹ <https://www.businessroundtable.org/business-roundtable-redefines-the-purpose-of-a-corporation-to-promote-an-economy-that-serves-all-americans> (Accessed 20/11/22).

² <https://unfccc.int/cop28>.

³ <https://www.reuters.com/business/environment/business-booms-sidelines-cop28-2023-12-11/>.

⁴ <https://www.un.org/en/desa/sdgs-must-become-dna-business-strategy-and-management>.

⁵ Bloomberg provides overall ESG score and decomposes in separate categories for E, S and G. An explanation of the ESG score approach taken by Bloomberg can be found at <https://www.bloomberg.com/professional/blog/transparency-methodology-and-consistency-in-esg-scoring/> (Accessed 20/11/22).

effects, propensity score matching and persistent both during and outwith the Global Financial Crisis (GFC) periods. We also test the effect of the information and governance environment on the relationship between ESG disclosure and business strategy. The results are stronger for firms with low analyst following when there is a high probability of informed trading. We also show that when institutional ownership or board independence is low, i.e., the governance environment is weaker, the negative association between prospector firms and ESG disclosure scores is significantly more pronounced. Consistent with our expectations, prospector firms are associated with lower sustainability scores.

Our paper contributes to the existing literature in the following ways. First, the study makes an important contribution to the literature on the effectiveness of ESG disclosure as a tool for informing investors on company behavior with respect to ESG and shareholder wealth objectives. The findings suggest that a focus on growth and expansion may come at the cost of social and environmental responsibility, highlighting the trade-off between growth and sustainability in business operations. This provides new insights into the challenges that companies face in balancing these competing objectives and the importance of considering ESG factors in business strategies. Our results also inform investors and regulators on the how firms pursuing different business strategies react to ESG disclosure.

Second, we contribute to the literature on managerial behavior with respect to shareholder wealth and stakeholder objectives in the context of the changing importance of ESG in modern financial markets. Moreover, the study's emphasis on the exacerbation of the negative relationship between a prospector strategy and ESG disclosure scores under conditions of weaker firm-level information and governance frameworks, as well as during periods of heightened policy uncertainty, highlights the importance of robust governance structures and transparent information disclosure. In the context of COP28 and the global commitment to addressing climate change, this highlights the necessity for firms to reinforce their internal mechanisms for monitoring and reporting on ESG metrics. Strengthening governance practices becomes pivotal not only for meeting regulatory requirements but also for aligning corporate strategies with the broader sustainability objectives outlined in international agreements such as the Paris Agreement. Final, the study's implications gain additional resonance in the context of the SDGs, which encompass a comprehensive framework for addressing pressing global challenges, including climate action, responsible consumption, and sustainable cities. By revealing the potential shortcomings of certain business strategies in achieving high ESG disclosure scores, the research emphasizes on the imperative for firms to align their operations with the SDGs. Corporations that integrate sustainability into their core strategies not only contribute positively to environmental preservation but also align themselves with the global community's aspirations for a more equitable, sustainable, and resilient future.

The rest of this paper proceeds as follows. Section 2 provides the theoretical background and hypotheses; Section 3 explains the research methodology and data. We present our results in Section 4 and conclude in Section 5.

2. Literature review and hypothesis development

Since the recognition of the power of a single corporate goal, managers have pursued shareholder wealth maximisation as the overarching corporate goal (Jensen, 2010). Despite the strength of the policy as a tool for effective decision-making, market failures such as shifting costs including pollution, exploitation of workers, predatory pricing, excessive compensation and others have raised the profile of the benefits of intervention to correct allocative efficiency in the event of market failure (Abudy et al., 2023; Lei & Luo, 2023). Wealth based approaches have been shown to be short-termist and detrimental to the long-term utility of society as a whole (Marsh, 1990). Climate change and other environmental concerns, social and wealth inequality, and poor governance and investor protection are examples of the issues arising from inefficiency of markets in the absence of corrective intervention.

Stakeholder approaches have been recognised since Freeman (1984) and argue for the redefinition of the corporate purpose to encompass objectives beyond the traditional corporate boundaries. Amongst the most prominent alternatives to the shareholder wealth maximisation (SWM) approach is Jensen's (2010) enlightened value maximisation (and enlightened stakeholder theory) approach. The stakeholder approach is underpinned by the simple premise that firms can benefit themselves and society by engaging in enlightened self-interest (Jensen, 2010). A similar approach is proposed by Solomon (2020) who argues for the use of instrumental ethics i.e., ethical means to achieve the corporate ends. And to the extent that agency issues can be exacerbated by the deviation from a policy of a single goal, it is appropriate to consider stakeholder theory and agency theory concurrently (Solomon, 2020). Agency and stakeholder theories have different implications for business strategy typologies and in our view these may affect the level of ESG engagement.

2.1. Business strategy and ESG disclosure

The approach adopted by companies towards competition within a given industry, in terms of the vision and objectives, is known as the business strategy (Langfield-Smith, 1997). According to Hambrick (1983), prominent amongst the plethora of business strategy typologies is the approach proposed by Miles et al. (1978) and Miles and Snow (2003). The Miles and Snow (1978, 2003) typology classifies business strategies into three main strategic archetypes: prospectors, analyzers, and defenders.⁶ Each of these classes of business strategy takes a different approach to competition with rivals. A prospector is a company which seeks to achieve their vision and objectives by dynamism and adaptability in the use and development of technology and organizational structure. Innovation is

⁶ Miles and Snow (1978, 2003) identify 'reactors' as a fourth business approach. Studies tend to ignore this category as it lacks the clarity and consistency in the definition required for rigorous identification compared to other groupings.

central to the way in which prospectors seek to build and exploit competitive advantages in their product markets. A prospector, as per the name, will search out new products and markets, seek first or early mover advantages and is likely to invest more in R&D. Top management and R&D teams are likely to dominate the organizational structure with flexibility being a key component of the approach to exploiting growth opportunities rapidly and as they arise. Miles et al. (1978) and Miles and Snow (2003) argue that these companies will often have less formalised and decentralised control mechanisms often involving large, transitory and diverse managerial coalitions. Conversely, companies which adopt or employ a defender strategy will be more cautious in their approach to fulfilling the vision and objectives of the organisation. Defenders will limit risky activities instead focusing on existing products and markets. Stability and cost efficiency will be central to the organizational philosophy. A third archetype of strategic behaviour is the analyzer strategy. Analyzers are more circumspect in their approach to the business objectives but less cautious than the defender category. It is a more balanced approach than the prospector or defender approach which may be considered as more directly opposite strategies.

The differences in the business strategies followed by companies will affect the approach to stakeholder objectives and ESG. The Miles and Snow (1978, 2003) typology implies an objective of wealth maximisation with each strategic archetype taking a different approach to the value creation. But the recognition of the need, by companies and society as a whole, to fulfil more than simply the profit objective, brings with it a need to establish how different business strategies approach the issue of ESG objectives. Risk and return vary greatly between the different strategic archetypes which will inevitably affect the approach to ESG. This in turn would be expected to be observable in companies' ESG disclosure scores. In particular, we expect that the high risk-high return strategy which is associated with the prospector strategy will lead to a lower focus on stakeholder objectives and lower ESG scores all other things being equal. Hence, our overarching research question is: does following a prospector approach lead to lower ESG disclosure scores?

The effect of strategic approach on risk-taking behaviour has been explored in a number of studies. Bentley et al. (2013) argue that the adopted business strategy is a strong indicator of the company approach to risk-taking whilst similarly, and perhaps predictably, Kothari et al. (2002) note that innovative firms, i.e., those who are likely to be considered to be prospector firms, are likely to be more willing to take risks. Ittner et al. (1997), Miles and Snow (2003) and Kong et al. (2022) recognize that prospector firms are likely to overreach in their attempts to exploit opportunities and put short-term financial stability at risk. The strategic deviance from normal practices arising due to the pursuit of the prospector strategy leads to increased operating costs and exposure to greater inefficiency. Yet higher risks associated with innovation and greater risk-taking may also pay off for the prospector. Alternatively, managers of prospector firms have greater flexibility and freedom to pursue private benefits of control rather than shareholder or other stakeholder objectives (Chen & Keung, 2019; Ittner et al., 1997).

A developing literature addresses the relationship between ESG disclosure, particularly ESG disclosure, financial performance and business strategy. Khan (2019), for example, provides evidence that ESG indicators can be an important indicator of financial performance whilst Amel-Zadeh and Serafeim (2018) identify the lack of consistent reporting standards as a major impediment to the effective use of ESG information by investors. Ratings may also be influenced by factors beyond ESG alone or maybe quite different when provided by different rating agencies. Regarding the former issue, Tang et al. (2021) show that firms sharing major owners with the ratings firm receive more favourable ratings. Whilst for the latter, Dimson et al. (2020) identify commonplace disagreement on ESG between agencies and application of different weightings of the pillars of ESG scores. They conclude that ESG scores used in isolation are unlikely to have a material effect on portfolio returns. Serafeim and Yoon (2022) examine market reactions ESG news and identify that consensus ESG moderates market reactions whilst high disagreement on score weakens the market reaction. Giese et al. (2021) decompose ESG scores into their pillar components to assess their effect on risk and return. Focusing on the time horizon, sector and weighting, Giese et al. (2021) indicate that the governance pillar (including for example governance scandals or fraud) was particularly relevant in the short term whilst environmental (such as carbon emissions) and social indicators are more relevant in the longer term. They argue that more relevant long term ESG ratings can be constructed by providing industry-specific weightings.

Various studies have explored the relationship between aspects of company characteristics, managerial behaviour and ESG ratings. Clementino and Perkins (2021) examine how firms respond to ESG ratings in a sample of Italian firms and show that managers can react differently to ESG ratings depending on managerial beliefs regarding the perceived benefits of conforming with or adjusting to ESG policies within the existing corporate strategy. Similar to the present study, Liu and Kong (2021) examine the effectiveness of the Miles and Snow (1978, 2003) typology on green innovation in China and identify that prospector firms engage in less sustainable development activity than defenders. Environmental regulation strengthens the relationship between business strategy and sustainable activity whilst political connections have the opposite effect. Maniora (2018) develops an empirical measure of 'mismanagement of sustainability' and examines whether business strategy influences the mismanagement. Prospector firms are found to be more likely to intentionally mismanage sustainability issues when compared to firms adopting a defender strategy, i.e., prospector firms are more likely to act unethically with respect to sustainability issues. Another pair of similar studies by Ho et al. (2022) and Lin et al. (2021) examine CSR and approaches to business strategy. Ho et al. (2022) finds a more significant positive relationship between external CSR, including activities which bring visibility and prestige to the company, and financial performance for U.S. prospector firms than for defenders. The opposite result is identified for internal CSR, such as activities which enhance employee relations, and financial performance. Lin et al. (2021), also using U.S. data, find that whilst high CSR firms over-invest, both the prospector strategy and the defender strategy can mitigate over-investment depending on the specific sector.

Two studies look specifically at the relationship between business strategy and environmental information. Wang et al. (2021) examine whether environmental disclosure is driven by business strategy and conclude that Chinese prospector firms tend to disclose more environmental information. Perhaps slightly contrary to previous studies and our expectation, Magerakis and Habib (2021) find that prospector firms are more likely to reduce their toxic chemical releases compared to defender firms.

Turning back to the issue of ESG ratings and the prospector strategy, the general consensus appears to favor the interpretation that

prospectors are less likely to engage in practices and policies which are consistent with sustainability and ESG. The prospector approach strategically deviates from business norms. Costs may be increased, and inefficiencies may be introduced as the company takes on decision and operational risks in pursuit of innovation and growth prospects, both of which have potential for highly positive or highly negative outcomes (Cohen et al., 2013). For this reason, credit rating agencies consider innovation as a risk factor when determining the issuer rating for their clients (Standard and Poors, 2013).

Engaging with ESG objectives is a managerial choice which may be constrained by the business strategy. Shareholders may prefer to follow an approach which is consistent with ESG objectives, perhaps at a cost to shareholder wealth, whilst managers may prefer to engage in value enhancing activities which are less consistent with the stakeholder approach, particularly ESG. The transparency of ESG scores allows owners and managers to observe the engagement with either approach, and in some case punish the failure to engage in ESG or wealth-creating activities. We posit that the transparency of ESG scores and the extent to which investors or managers will (or need to) respond to such scores depends on the strategic profile pursued.

The preceding literature provides support for the view that prospector strategies are likely to be associated with less regard for sustainability. As viewed through an agency lens, prospector firms might be less transparent, be able to be less responsive to ESG disclosure scores and be more inclined to prioritize the wealth objective. Prospector firms are more prone to managerial opportunism and agency costs. In addition, we argue that following an innovation and wealth objective, which is associated with higher uncertainty and greater default risk, prospector firms may have less regard to stakeholder and ESG objectives than other strategic archetypes, i.e., defenders or analyzers. Whilst we have no formal hypothesis regarding defender or analyzer firms, one alternative hypothesis is that prospectors are more inclined to ESG engagement. This may be true for firms invested in, for example, sustainable technology. However, such firms are themselves still subject to the agency issues identified above. Hence, our first hypothesis is as follows.

H1. Prospector firms exhibit lower ESG disclosure scores than defenders and analyzers.

2.2. The information environment and corporate governance

Different strategic archetypes have different implications for information asymmetry and corporate governance (Dang et al., 2022). In this section, we first explain our expectation regarding the impact of the information environment on the association between ESG ratings and business strategies. Next, we discuss the effect of corporate governance on the sustainability practices of prospector firms.

2.2.1. Information asymmetry

Prospector firms are subject to greater information asymmetry due to the greater reliance on intangible assets, partially or entirely undefined growth prospects, and high levels of uncertainty of future operations. Miles et al. (1978) and Miles and Snow (2003) argue that prospectors will possess greater growth opportunities, grow more quickly, and their company value will be more subject to the inherent uncertainty, than defender firms. According to Aboody and Lev (2000), intangible assets, often in the form of R&D, are considerably more difficult to value with accuracy using public information. This gives rise to information asymmetry in favor of prospector firms regarding the future prospects of the firm (Gaver & Gaver, 1993; Smith & Watts, 1992). On the other hand, the inherently higher uncertainty regarding future cash flows and the implications for stock prices of prospector firms compared to defender firms gives rise to downside information asymmetry (Bentley et al., 2013; Rajagopalan, 1997). In essence, defenders rely more heavily on predictable asset bases compared to prospectors whose future asset bases are more uncertain (Cheng & Kesner, 1997; Rajagopalan, 1997). For example, Zhang (2021) reports that stock prices of prospector firms carry less information than stock prices of defender firms, i.e., there is less information asymmetry in defender firms. Similarly, Barth et al. (2001) find that market valuation is more uncertain when intangible assets form a large proportion of the company's assets.

There is little in the literature to date on the link between information asymmetry and ESG scores of prospector firms. We argue that in the presence of information asymmetry, monitoring and governance (note that in our next hypothesis we consider how certain specific aspects of governance affect the relationship between prospector firms and ESG disclosure) will be weakened giving rise to our expectation of a negative relationship between prospector-type firms and ESG disclosure scores, and that this effect will be more pronounced in firms with weaker information settings. The lack of transparency and greater uncertainty associated with prospector activities may limit the effectiveness of ESG disclosure scores as a monitoring tool and reduce the perceived benefits associated with their maintenance (Clementino & Perkins, 2021). Beyond the principles of the owners and managers of firms, there is no constraint on their adherence to wealth or private objectives except market valuation (which may be constrained by customer behavior). Publicly available ESG disclosure scores provide an avenue for such monitoring but are likely to be more easily observed and price relevant in defender and analyzer firms than prospectors (Dimson et al., 2020).

H2. The negative association between the prospector strategy and ESG disclosure scores is more pronounced for firms in the presence of weaker firm-level information environment.

2.2.2. Corporate governance

Jensen (2010) argues that introducing a stakeholder approach to the corporate objective will inevitably lead to confusion about how to trade-off between the plethora of competing objectives of the many stakeholders both within and without the firm. As a result, managers will be less accountable and agency costs will increase. Previous studies indicate that, due to the greater level of uncertainty and lower predictability of operations, monitoring is more difficult and agency costs will be higher for firms which follow a prospector approach than more defensive strategies (Chen & Keung, 2019; Ittner et al., 1997; Rajagopalan, 1997; Rajagopalan & Finkelstein, 1992). Prospecting firms will have greater discretion over the use of corporate assets than companies following the defender strategy.

Such discretion may be used to pursue self-interest at the expense of other stakeholders (Chen & Keung, 2019; Ittner et al., 1997; Rajagopalan, 1997; Rajagopalan & Finkelstein, 1992). The increased information asymmetry associated with the prospector strategy will make monitoring more difficult and give rise to managerial opportunism and the pursuit of private benefits of control (Rajagopalan, 1997).

Jensen and Meckling (1976) argue that a strong governance system is required to control for agency costs. Given that monitoring and information asymmetry vary across different business strategies (Hsu et al., 2018), governance systems may be less stringent in prospector firms (Bentley et al., 2013; Bentley-Goode et al., 2017). Such firms are more likely to have more flexible internal control systems in order to respond more quickly to market opportunities, but which also may allow greater opportunities for pursuit of private benefits of control. Habib and Hasan (2021) argue that the presence of lower levels of transparency and disclosure in prospector firms are an indication of their weaker corporate governance systems. In a similar vein, Dang et al. (2022) find prospector firms with lower board independence or lower institutional ownership, and hence for whom the governance environment is weaker, have lower credit ratings. Prospector firms also receive lower credit ratings regardless of the sophistication of the information environment as measured by Amihud's (2002) illiquidity measure or the level of analyst following (Dang et al., 2022).

Following this same logic, we argue that if firms follow a prospector approach, then they are less likely to also follow a stakeholder approach. There are several reasons for this. Firstly, prospector firms may be more wealth oriented than defender or analyzer firms, and thus they will be less engaged with stakeholder objectives. Second, prospector firms are likely to be less transparent than defender or analyzer firms which may in turn lead to such firms being less concerned with or responsive to ESG disclosure scores. Third, the inherent agency problems within prospector firms are likely to be associated with lower engagement with stakeholder objectives. In this framework, ESG disclosure scores might be considered a proxy for the extent to which stakeholder objectives are observed. Hence, we argue that a strong governance system will result in reduced agency problems and greater adherence to ESG objectives, which can be observed in ESG disclosure scores of prospector firms. As a result, we expect to observe a more pronounced negative relationship between the pursuit of a prospector strategy and ESG disclosure scores when corporate governance systems are weaker. We would expect that defender or analyzer strategies would be associated with greater transparency and predictability, tighter governance and consequently greater adherence to stakeholder objectives.

H3. The negative association between the prospector strategy and ESG disclosure scores is more pronounced for firms in the presence of weaker firm-level governance environment.

2.3. The impact of uncertainty

When there are unexpected shifts in macroeconomic factors, including interest rates, inflation, exchange rates, and unemployment rates, among others, governments may respond in ways that are difficult to predict. This can lead to heightened uncertainty within the business environment (Bordo et al., 2016; Danisman et al., 2021; Ng et al., 2020; Ozili, 2021). Firms following a prospector approach are particularly susceptible to the inherent vagaries of this business environment. Dang et al. (2022) demonstrate the influence of policy uncertainty on the credit ratings of prospector firms. This uncertainty can also impact a firm's engagement with stakeholder objectives.

If a prospector firm is uncertain about the potential advantages of participating in ESG activities, it might reconsider its engagement. If the costs associated with ESG initiatives increase, possibly due to higher financing expenses stemming from policy uncertainty (Kaviani et al., 2020; Pastor & Veronesi, 2013), prospector firms could become less inclined than defender or analyzer firms to actively pursue sustainability agendas. Jin et al. (2019) identify an augmented risk of market crashes during periods of elevated policy uncertainty, which could potentially diminish the willingness of prospector companies, in particular, to prioritize non-wealth-oriented objectives.

In a similar vein, Lou et al. (2022) find that economic policy uncertainty exerts a detrimental impact on innovation. Given that prospector firms tend to be more influenced by economic policy uncertainty and are less constrained when it comes to pursuing wealth-oriented goals, our final hypothesis asserts that policy uncertainty will be linked to diminished ESG disclosure scores.

H4. The inverse relationship between the prospector strategy and ESG disclosure scores becomes more evident when examining firms operating during periods of heightened uncertainty.

3. Data and methodology

3.1. Data and sample

Our research leverages data from diverse sources to construct variables pertinent to U.S. non-financial firms spanning the time-frame of 2005–2019. We selected 2005 as the starting point for our sample period for several specific reasons. First, the year 2005 marked a significant shift in corporate sustainability practices and ESG reporting due to several regulatory and market-driven developments. Specifically, 2005 was when the Kyoto Protocol took effect, encouraging increased global attention to environmental impact and corporate responsibility. This policy change encouraged many companies, especially in the U.S., to begin adopting more structured ESG practices, making 2005 a relevant starting point for analyzing ESG disclosure trends. Second, data availability in terms of ESG disclosure. Prior to this year, ESG data coverage in Bloomberg and similar databases was limited and less consistent, particularly for non-financial firms. Starting the sample period in 2005 allowed us to employ a comprehensive dataset to ensure robust analysis.

The ESG disclosure scores, encompassing Environmental (ENV), Social (SOC), and Governance (GOV), are sourced from

Table 1

Descriptive Statistics This table reports the descriptive statistics for our sample. The appendix provides a detailed description of the variables used in the regression analysis. We winsorize continuous variables at the 1 % and 99 % levels.

Variables	Sample	Mean	Median	Min	P25	P75	Max	SD
ESG	6,976	23.0176	17.3554	9.9174	13.2231	28.9256	61.5702	13.2982
lnESG	6,976	2.9979	2.8539	2.2943	2.5820	3.3647	4.1202	0.5045
ENV	3,976	20.2736	13.9535	1.5504	4.6512	34.1085	64.3411	17.7855
SOC	5,696	22.0496	19.2982	3.3333	8.7719	28.0702	63.1579	14.4684
GOV	6,976	54.4878	51.7857	42.8571	51.7857	55.3571	76.7857	6.6029
PROSPECT	6,976	0.2470	0.0000	0.0000	0.0000	0.0000	1.0000	0.4951
BS	6,976	2.2080	2.1972	1.6094	2.0794	2.3979	2.8332	0.2281
CEODUAL	6,976	0.2199	0.0000	0.0000	0.0000	0.0000	1.0000	0.4142
GENDIV	6,976	0.7979	1.0000	0.0000	1.0000	1.0000	1.0000	0.4016
BI	6,976	0.8936	0.8750	0.5714	0.8333	0.9000	1.9167	0.1943
SIZE	6,976	7.8983	7.7665	4.0130	6.7004	8.9536	12.7173	1.6243
ROA	6,976	5.8342	5.5838	-1.5927	2.6192	6.5551	9.7396	1.0828
MB	6,976	3.3980	2.6728	0.5341	1.7427	2.4021	5.8506	0.8886
LEV	6,976	0.3302	0.2873	0.0890	0.2775	0.6763	0.7971	0.2200
ASSETLIQ	6,976	2.4340	1.9350	0.3982	1.2859	2.9243	4.7568	1.8125
OCF	6,976	0.1034	0.0962	-0.1154	0.0634	0.1405	0.3222	0.0712
ANALYST	6,976	1.3480	1.3832	0.8472	1.2528	1.4663	1.6094	0.1632
IO	6,976	68.8058	64.7960	28.6090	56.6670	87.1370	98.4320	1.6637

Bloomberg. The characterization of business strategy approach (*PROSPECT*), as formulated by Miles et al. (1978) and Miles and Snow (2003), is derived from the Compustat database. The quantification of corporate governance variables (*BS*, *CEODUAL*, *GENDIV*, and *BI*) is drawn from BoardEx/ISS. Accounting-based metrics (*SIZE*, *ROA*, *MB*, *LEV*, *ASSETLIQ*, and *OCF*) are procured through the Compustat repository. Analyst coverage (*ANALYST*) data is extracted from I/B/E/S, while information regarding institutional ownership (*IO*) is gleaned from the Thomson Reuters Institutional 13F database. The study encompasses a total of 6,976 observations spanning firm-year data, covering the period from 2005 to 2019.

For classification of firms to a particular strategic business approach (*PROSPECT*), we follow a method similar to Ittner et al. (1997), Miles et al. (1978) and Miles and Snow (2003) and assign a value of one (zero) for prospector-type (defender and analyzer) firms. This encapsulates six firm-year estimates of business activity based on a rolling five-year average: (1) the firm's propensity to search for new products; (2) its ability to produce and distribute products and services efficiently; (3) the firm's historical growth patterns and future potential investment opportunities; (4) the firm's focus on new products and services; (5) its organizational stability; as well as (6) its commitment to technological efficiency.⁷ Firms are scored in each category by industry and year, with the highest (lowest) quintile receiving a score of 5 (1).

Further, we compute a discrete composite measure by summing the scores for each variable for each firm year. The scoring system allows for a maximum score of 30 and a minimum score of 6. Therefore, we classify firms receiving a score of 6–12 as defenders, firms receiving a score of 13–23 as analyzers, while firms receiving a score of 24 or above as prospectors.

3.2. Summary statistics

Table 1 presents the descriptive statistics pertaining to the variables observed within our dataset. The calculated mean ESG value of 23.0176 indicates that, on average, the sampled firms possess a relatively diminished ESG score. This lower ESG score can be attributed to the subpar Environmental (*ENV*) and Social (*SOC*) components, both of which hover around 20–22. Conversely, the Governance (*GOV*) component demonstrates a notably elevated mean value of 54.4878. This figure aligns with the findings of the research conducted by Atif et al. (2022), focusing on 1,290 non-financial U.S. firms during the period of 2006–2015.

In terms of business strategy, a significant proportion of the sampled firms appear to adopt defender and analyzer strategies. The metrics of median and p75 for the *PROSPECT* variable are both established at 0. The controls, meanwhile, exhibit a relatively uniform distribution, characterized by closely similar mean and median values.

Fig. 1 illustrates the mean ESG disclosure of U.S. firms juxtaposed against their respective business strategy scores spanning the timeframe of 2005–2019. The depicted data reveals a notable inverse correlation between the ESG disclosure of firms and their corresponding business strategy scores. This observation aligns seamlessly with the outcomes of our univariate analysis. Fig. 1 effectively showcases that as the business strategy scores ascend, indicative of a more proactive stance (prospectors), the associated ESG scores tend to decline. Our initial hypothesis receives empirical backing from the results depicted in Fig. 1, substantiating that firms adopting a prospector approach exhibit inferior ESG disclosure in comparison to those pursuing defender and analyzer strategies. To rigorously explore the connection between firms embracing a prospector strategy and their ESG disclosure, we proceed in the subsequent section to control for various determinants of ESG disclosure within a multivariate framework.

⁷ See Appendix 3 for a detailed explanation of the estimation procedure.

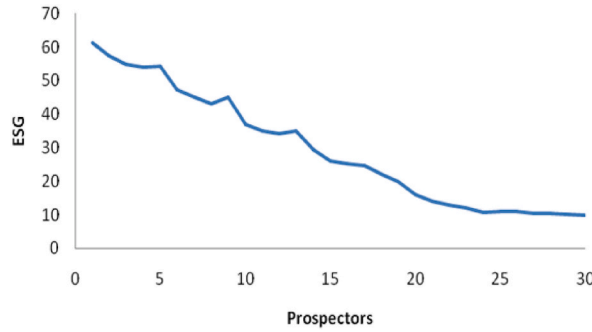


Fig. 1. Business strategy score and ESG disclosure score.

4. Empirical results

4.1. Baseline results

To explore the relation between corporate business strategy and firms' ESG disclosure scores, we use the following panel specification model as follows:

$$ESG_{i,t} = \alpha + \beta_1 PROSPECT_{i,t} + \sum_c \beta_c Control_{c,i,t-1} + \sum_k \gamma_k Year_k + \sum_d \gamma_d Industry_d + \varepsilon_{i,t} \quad (1)$$

In Eq. (1) the environmental, social and governance disclosure at time t for firm i is captured by $ESG_{i,t}$. We consider several measurements of ESG including the composite ESG - measured in absolute terms (ESG) and logarithm ($\ln ESG$) - and ESG components, including environment (ENV), social (SOC), and governance factors (GOV). $PROSPECT_{i,t}$ is a dummy variable which takes the value of one for prospector-type firms and zero for defender firms and analyzer firms. Following previous studies (e.g., Berg et al., 2022; Habib & Hasan, 2021; Luo, 2022), we include a range of client-firm level control variables ($Control_{c,i,t-1}$) in the regression for firm i at $t-1$, including board size (BS), CEO duality ($CEODUAL$), gender diversity ($GENDIV$), board independence (BI), firm size ($SIZE$), return on assets (ROA), market-to-book (MB), leverage (LEV), asset liquidity ($ASSETLIQ$), operating cash flow (OCF), analyst coverage ($ANALYST$), and institutional ownership (IO). We also include year, and industry fixed effects. All continuous variables are winsorized at the 1 % and 99 % levels. Standard errors are clustered by firm.⁸ Detailed variable definitions are presented in Appendix 1.

The findings obtained from the first two columns of Table 2 demonstrate that the coefficients of the $PROSPECT$ variable exhibit statistical significance at the 1 % level. This outcome indicates that firms following a prospector approach tend to possess ESG disclosure that are remarkably lower than those of defender and analyzer firms. Thus, this finding supports our initial hypothesis, H_1 . When the focus shifts towards ESG component considerations, the results presented in columns (3) through (5) unveil a negative correlation between business strategy and its disclosure scores in the environmental (ENV), social (SOC), and governance (GOV) dimensions, all significant at the 1 % level.

Besides being highly statistically significant, the results are also economically meaningful. For example, a one-standard-deviation increase in prospector strategy using the combined model (0.4951), results in a decrease in ESG scores of approximately 8.90 percentage points ($=0.4951 \times 0.1798$), which is roughly 0.39 % ($=0.4951 \times 0.1798 / 23.0176$) of the average ESG scores across all firms in the sample. This leads us to conclude that prospector firms, in comparison to their defender and analyzer counterparts, exhibit diminished disclosure scores in ESG factors, thereby corroborating our primary hypothesis.

Prospector firms, driven by innovation and wealth-oriented objectives, typically channel investments into ventures that involve elevated levels of risk and uncertainty. Consequently, their operational landscape is characterized by heightened unpredictability and default risk in contrast to other strategic profiles such as defenders or analyzers (Miles & Snow, 1978; 2003). Given their constrained resource allocation, prospector firms tend to allocate lesser attention to ESG practices, leading to comparatively lower ESG scores relative to their peer groups (Chen & Keung, 2019; Ittner et al., 1997).

In terms of control variables, the results highlight several remarkable patterns. Specifically, board size (BS), gender diversity ($GENDIV$), board independence (BI), firm size ($SIZE$), profitability (ROA), market-to-book ratio (MB), institutional ownership (IO), and

⁸ In our analysis, we opted to use robust standard errors to account for potential heteroscedasticity in the data, which is common in financial and ESG-related datasets. Since robust standard errors provide a more reliable estimate of variability when heteroscedasticity or clustering may be present, they ensure our results are not biased by variance differences across observations. Given our sample of U.S. non-financial firms and the nature of their business strategies and ESG disclosures, using robust standard errors helps address any violations of homoscedasticity assumptions. Further, as our model includes firm-level and year-based fixed effects, robust standard errors allow us to control for within-firm correlation and ensure more reliable inference.

⁹ The low variance inflation factor (VIF) values suggest that multicollinearity is not a significant concern in our analysis; the detailed values are omitted for brevity.

Table 2

The impact of business strategy on ESG disclosure scores This table reports the results for the relation between corporate business strategy and firms' ESG disclosure scores. We use the following panel specification model as follows: $ESG_{i,t} = \alpha + \beta_1 PROSPECT_{i,t} + \sum_c \beta_c Control_{c,i,t-1} + \sum_k \gamma_k Year_k + \sum_d \gamma_d Industry_d + \varepsilon_{i,t}$. (1) In Eq. (1) the environmental, social and governance disclosure at time t for firm i is captured by $ESG_{i,t}$. We consider several measurements of ESG including the composite ESG - measured in absolute terms (ESG) and logarithm ($lnESG$) - and ESG components, including environment (ENV), social (SOC), and governance factors (GOV). $PROSPECT_{i,t}$ is a dummy variable which takes the value of one for prospector-type firms and zero for defender firms and analyzer firms. We include a range of client-firm level control variables ($Control_{c,i,t-1}$) in the regression for firm i at $t-1$, including board size (BS), CEO duality ($CEODUAL$), gender diversity ($GENDIV$), board independence (BI), firm size ($SIZE$), return on assets (ROA), market-to-book (MB), leverage (LEV), asset liquidity ($ASSETLIQ$), operating cash flow (OCF), analyst coverage ($ANALYST$), and institutional ownership (IO). We also include year, and industry fixed effects. The t -statistics shown in parentheses are based on standard errors that are adjusted for heteroscedasticity and are clustered at the industry and year level. We winsorize continuous variables at the 1 % and 99 % levels. Superscripts *, **, and *** denote significance levels of 10 %, 5 %, and 1 %, respectively.

Variables	ESG	lnESG	ENV	SOC	GOV
<i>PROSPECT</i>	-0.1798 (-4.21)***	-0.0253 (-2.70)***	-0.2141 (-3.31)***	-0.2226 (-2.90)***	-0.1411 (-2.81)***
<i>BS</i>	5.7815 (8.61)***	0.2069 (8.49)***	8.8975 (5.84)***	4.7072 (4.88)***	2.7553 (7.86)***
<i>CEODUAL</i>	-0.566 (-1.92)*	-0.0177 (-1.67)*	-0.9923 (-1.68)*	-0.8194 (-2.14)**	-0.1995 (-1.26)
<i>GENDIV</i>	1.5774 (5.89)***	0.0962 (8.88)***	4.418 (5.65)***	2.8455 (6.67)***	1.0164 (7.38)***
<i>BI</i>	0.6069 (0.89)	0.0339 (1.40)	0.8519 (0.65)	0.3735 (0.44)	0.4646 (1.26)
<i>SIZE</i>	5.0512 (46.07)***	0.1929 (51.93)***	6.7938 (30.27)***	4.7679 (32.67)***	2.0728 (33.84)***
<i>ROA</i>	0.022 (1.18)	0.0002 (0.35)	0.0348 (0.68)	0.0071 (0.26)	0.0009 (0.10)
<i>MB</i>	0.2549 (9.92)***	0.0086 (9.68)***	0.3023 (6.40)***	0.228 (7.44)***	0.135 (9.46)***
<i>LEV</i>	-6.5164 (-7.82)***	-0.2128 (-7.15)***	-6.1134 (-3.19)***	-5.8998 (-5.34)***	-3.3814 (-8.00)***
<i>ASSETLIQ</i>	-0.0953 (-1.30)	-0.0061 (-2.17)**	-0.1284 (-0.55)	-0.062 (-0.57)	-0.0041 (-0.11)
<i>ANALYST</i>	0.7585 (1.06)	0.0292 (1.14)	0.8029 (0.54)	1.0306 (1.07)	0.5371 (1.43)
<i>IO</i>	0.0699 (10.01)***	0.0018 (7.10)***	0.0651 (4.03)***	0.041 (4.23)***	0.0275 (7.56)***
<i>OCF</i>	10.023 (4.90)***	0.3671 (4.85)***	21.3891 (4.30)***	4.105 (1.38)	2.8598 (2.70)***
<i>Constant</i>	-33.5442 (-8.71)***	0.7960 (5.73)***	-72.1747 (-9.67)***	-40.2941 (-9.72)***	29.2489 (14.67)***
<i>Industry and Year effects</i>	Yes	Yes	Yes	Yes	Yes
<i>Adj. R²</i>	0.5516	0.6014	0.4410	0.4509	0.4699
<i>Nobs</i>	6,976	6,976	3,976	5,696	6,976

operating cash flow (OCF) exhibit positive impacts on ESG disclosure at statistically significant levels of 1 % and 5 %. These outcomes align closely with the existing body of literature. The evidence suggests that firms with a larger board size (BS), the inclusion of female directors on the board ($GENDIV$), and a higher proportion of independent directors (BI) tend to attain elevated ESG disclosure scores, which concurs with prior research (McBrayer, 2018). Moreover, firms boasting larger size ($SIZE$), improved profitability (ROA), higher market-to-book ratios (MB), increased institutional ownership (IO), and stronger operating cash flows (OCF) are also inclined to exhibit superior ESG disclosures, in line with prior studies (e.g., Campbell, 2007; Gamerschlag et al., 2011; McBrayer, 2018). In contrast, firms characterized by CEO duality ($CEODUAL$) and elevated levels of leverage (LEV) showcase diminished ESG disclosure for both overall composite scores and individual component values, echoing the findings of prior research (McBrayer, 2018).

4.2. Robustness checks

While our baseline model takes into account a wide array of firm characteristics, the established correlation between business strategy and a firm's ESG disclosure may encounter challenges stemming from latent, unobservable firm attributes. These unaccounted variables could potentially exhibit correlations with our explanatory variables within the model, thus undermining the assumption of exogeneity in the error terms. In order to mitigate this concern, our initial approach involves a re-evaluation of the baseline model employing the fixed-effects estimator. This estimation method incorporates controls for both firm-specific and annual variations, as opposed to exclusively industry-based effects. The findings presented in Table 3 affirm the persistence of the adverse impact of business strategy on ESG disclosure, even after accounting for firm-specific effects through the fixed-effects model. Remarkably, the coefficients related to *PROSPECT* remain consistently negative across all models, attaining statistical significance at least 5 % level.

Second, Table 1 above reveals that 75 % of firms in our sample have large market value (MB larger than 1.74). Thus, it is possible

that our results are driven by these value firms. To account for this possibility, we divide our sample into two groups based on the market capitalization. Firms with market capitalization larger (smaller) than the median value are classified as high (low) market capitalization. We re-estimated the baseline model across the two sub-samples. Panel A and B of Table 4 indicates that the negative association between prospector-type strategies and ESG disclosure is not affected by the firm's market capitalization, confirming our first hypothesis.

To further examine whether industry-specific factors might influence the relationship between business strategy and ESG disclosure, we conducted an additional analysis by re-estimating the baseline model for firms within "brown" and "neutral" industries separately. Industries categorized as "brown" are those often associated with significant environmental impacts and higher regulatory scrutiny from an ESG perspective, such as Mining (SIC 12), Petroleum Refining and Related Industries (SIC 29), Electric, Gas, and Sanitary Services (SIC 49), and Manufacturing (SIC 20–39). These industries typically face more stringent environmental regulations and public pressure due to their greater environmental influence, which could, in theory, influence firms' ESG disclosure practices and potentially interact with business strategy choices. On the other hand, "neutral" industries are sectors generally perceived as having a lesser direct environmental impact and thus may face fewer ESG-related regulatory or reputational pressures. In this analysis, we categorized "neutral" industries as Business Services (SIC 73), Communication (SIC 48), and Engineering, Accounting, Research, Management, and Related Services (SIC 87). Panels C and D of Table 4 report the results of our industry-specific re-estimation. The findings show that the negative association between prospector-type strategies and ESG disclosure is consistently significant across both brown and neutral industries. This consistency suggests that the prospector strategy's impact on ESG disclosure is robust and does not vary substantially based on the industry's environmental classification. These results further validate our hypothesis that firms pursuing a prospector strategy are generally less engaged in ESG disclosure regardless of industry-specific ESG pressures, highlighting the influence of business strategy on ESG behavior independently of the industry's ESG characteristics.

Table 3

Firm fixed effects This table reports the results for the regression of business strategy on ESG disclosure scores using the fixed-effects estimator, where we control for the firm- and year-fixed effects, instead of industry fixed effects. *ESG* denotes the environmental, social and governance performance of firm *i* in year *t*. *PROSPECT* is a dummy variable which takes the value of one for prospector-type firms and zero for defender firms and analyzer firms. *CONTROLS* is the set of control variables with a one-year lag, including board size (*BS*), CEO duality (*CEODUAL*), gender diversity (*GENDIV*), board independence (*BI*), firm size (*SIZE*), return on assets (*ROA*), market-to-book (*MB*), leverage (*LEV*), asset liquidity (*ASSETLIQ*), Operating cash flow (*OCF*), analyst coverage (*ANALYST*), and institutional ownership (*IO*). The *t*-statistics shown in parentheses are based on standard errors that are adjusted for heteroscedasticity and are clustered at the firm and year level. We winsorize continuous variables at the 1 % and 99 % levels. Superscripts *, **, and *** denote significance levels of 10 %, 5 %, and 1 %, respectively.

Variables	<i>ESG</i>	<i>lnESG</i>	<i>ENV</i>	<i>SOC</i>	<i>GOV</i>
<i>PROSPECT</i>	−0.1479 (−3.49)***	−0.0212 (−2.16)**	−0.1934 (−2.76)***	−0.2031 (−2.61)***	−0.0851 (−2.28)**
<i>BS</i>	1.5081 (2.18)**	0.0652 (2.51)**	2.3638 (1.52)	−0.1171 (−0.11)	0.767 (1.58)
<i>CEODUAL</i>	−0.2527 (−0.88)	−0.0126 (−1.23)	−0.1792 (−0.31)	−0.0226 (−0.05)	−0.3345 (−1.69)*
<i>GENDIV</i>	0.6088 (2.12)**	0.0581 (5.20)***	2.7142 (3.17)***	1.0756 (2.29)**	0.3601 (1.99)**
<i>BI</i>	1.7192 (1.60)	0.0365 (1.00)	1.4975 (0.81)	1.1048 (0.88)	1.052 (1.69)*
<i>SIZE</i>	0.858 (2.45)**	0.0556 (4.57)***	1.1015 (1.51)	0.7102 (1.71)*	0.1811 (1.00)
<i>ROA</i>	0.009 (0.70)	0.0005 (1.10)	0.0444 (1.12)	0.0347 (1.55)	0.0017 (0.22)
<i>MB</i>	0.0204 (1.02)	0.0011 (1.44)	0.0932 (2.02)**	0.0001 (0.00)	0.0344 (2.62)***
<i>LEV</i>	−0.6806 (−0.75)	−0.0224 (−0.67)	−2.1479 (−0.79)	−0.4995 (−0.33)	−1.1547 (−1.91)*
<i>ASSETLIQ</i>	−0.0269 (−0.33)	−0.0013 (−0.41)	−0.0394 (−0.16)	0.214 (1.62)	0.0179 (0.38)
<i>ANALYST</i>	0.4746 (1.13)	0.0159 (1.02)	0.9054 (0.97)	0.3351 (0.52)	0.1193 (0.44)
<i>IO</i>	0.021 (2.84)***	0.0005 (1.75)*	0.0161 (0.83)	0.0166 (1.36)	0.0097 (2.22)**
<i>OCF</i>	3.1133 (2.00)**	0.0688 (1.18)	10.3136 (2.24)**	5.5917 (2.05)**	1.9496 (2.00)**
<i>Constant</i>	−0.2628 (−0.07)	2.015 (14.96)***	−18.267 (−2.19)**	−2.6735 (−0.56)	45.231 (18.43)***
<i>Firm and Year effects</i>	Yes	Yes	Yes	Yes	Yes
<i>Adj. R²</i>	0.9119	0.9343	0.8572	0.8645	0.8762
<i>Nobs</i>	6,976	6,976	3,976	5,696	6,976

Table 4

Check with sub-samples Panel A and Panel B reports the results for the regression of business strategy on ESG disclosure scores across two firm-groups based on market capitalization. Panel C and Panel D reports the results for the regression of business strategy on ESG disclosure scores across two firm-groups based on types of industry, Brown and Neutral industries. Brown industries include those classified under SIC 12 (Mining), SIC 29 (Petroleum Refining and Related Industries), SIC 49 (Electric, Gas, and Sanitary Services), and SIC 20–39 (Manufacturing); while Neutral industries encompass SIC 73 (Business Services), SIC 48 (Communication), and SIC 87 (Engineering, Accounting, Research, Management, and Related Services). We re-estimated our primary regression analysis across these sub-sample groupings. The model variables are defined as in Table 2. The *t*-statistics shown in parentheses are based on standard errors that are adjusted for heteroscedasticity and are clustered at the industry and year level. We winsorize continuous variables at the 1 % and 99 % levels. Superscripts *, **, and *** denote significance levels of 10 %, 5 %, and 1 %, respectively.

Panel A: High Market Capitalization					
Variables	ESG	lnESG	ENV	SOC	GOV
<i>PROSPECT</i>	−0.1539 (−3.72)***	−0.0229 (−2.35)**	−0.1886 (−2.98)***	−0.1969 (−2.53)**	−0.1243 (−2.45)**
<i>All controls</i>	Included	Included	Included	Included	Included
<i>Industry and Year effects</i>	Yes	Yes	Yes	Yes	Yes
<i>Adj. R²</i>	0.5234	0.5387	0.4867	0.4934	0.5195
<i>Nobs</i>	3,411	3,411	1,944	2,785	3,411
Panel B: Low Market Capitalization					
<i>PROSPECT</i>	−0.1361 (−3.17)***	−0.0184 (−2.03)**	−0.1628 (−2.47)**	−0.1665 (−2.16)**	−0.1063 (−2.18)**
<i>All controls</i>	Included	Included	Included	Included	Included
<i>Industry and Year effects</i>	Yes	Yes	Yes	Yes	Yes
<i>Adj. R²</i>	0.5164	0.5206	0.4716	0.4783	0.5084
<i>Nobs</i>	3,402	3,402	1,939	2,778	3,402
Panel C: Brown Industries					
<i>PROSPECT</i>	−0.1976 (−4.61)***	−0.0278 (−2.97)***	−0.2355 (−3.62)***	−0.2449 (−3.12)***	−0.1554 (−3.03)***
<i>All controls</i>	Included	Included	Included	Included	Included
<i>Industry and Year effects</i>	Yes	Yes	Yes	Yes	Yes
<i>Adj. R²</i>	0.4781	0.5130	0.3786	0.3844	0.4017
<i>Nobs</i>	2,478	2,478	1,643	1,947	2,478
Panel D: Neutral Industries					
<i>PROSPECT</i>	−0.1635 (−3.82)***	−0.0249 (−2.75)***	−0.1992 (−2.94)***	−0.2154 (−2.83)***	−0.1348 (−2.76)***
<i>All controls</i>	Included	Included	Included	Included	Included
<i>Industry and Year effects</i>	Yes	Yes	Yes	Yes	Yes
<i>Adj. R²</i>	0.4575	0.4944	0.3655	0.3745	0.3893
<i>Nobs</i>	2,384	2,384	1,598	1,868	2,384

4.3. Propensity score matching (PSM) analysis and endogeneity problem

Prospecting firms may manifest distinct characteristics compared to analyzer and defender firms, potentially yielding disparate ESG disclosure. In simpler terms, the characteristics that distinguish the different types of business strategy may also influence the ESG disclosure, making it difficult to isolate the true impact of the business strategy type on ESG disclosure. To mitigate concerns about endogeneity, researchers frequently deploy diverse methodologies, including the utilization of Propensity Score Matching (PSM). PSM is a statistical technique employed in observational studies to mitigate selection bias and manage endogeneity (Rosenbaum & Rubin, 1983). The central idea of PSM is to create balanced comparison groups by matching treated units (prospector firms in this case) with control units (analyzer and defender firms) that are similar in terms of their propensity to be treated. Propensity score here refers to the probability of a firm being a prospector, given its observable characteristics. By accounting for observed differences through matching on propensity scores, PSM helps isolate the effect of the business strategy type on ESG disclosure from the potential influence of other characteristics. Accordingly, we conduct the PSM analysis to ensure that firms following different business strategies are comparable. The PSM analysis is conducted on two groups - the treatment group and control group. We estimate propensity scores using our base set of controls for prospectors (treatment) and defenders and analyzers (control). Then, we match firms in these two groups on year, two-digit SIC codes, and closest propensity score with a maximum distance of 1 % value with no-replacement.

Table 5 Panel A reports low *t*-statistics, which suggests no significant difference between the treatment and control groups with respect to the observed characteristics. Table 5 Panel B reports the regression results from re-estimation of the baseline model using the matched treatment-control pairs. Similar to the baseline results, the negative association between business strategy and a firm's ESG disclosure confirms our first hypothesis.

Further, it is possible that ESG practices can shape the firm's business strategy. ESG practices can significantly impact a firm's reputation and brand image. A commitment to sustainability, ethical behavior, and social responsibility can enhance a firm's image. Also, ESG practices can drive innovation within a firm. The need to address environmental and social challenges can spark the development of new products, services, and generally business strategy that align with sustainability goals. In such a case, there can be

Table 5

PSM Analysis Panel A shows the average treatment effects obtained from propensity score matching. Firms with business strategy (above yearly two-digit SIC industry median) are our treatment firms, whereas firms with low business strategy are our control firms. Panel B presents the results based on PSM regression. The model variables are defined as in Table 2. The *t*-statistics shown in parentheses are based on standard errors that are adjusted for heteroscedasticity and are clustered at the industry and year level. Superscripts *, **, and *** denote significance levels of 10 %, 5 %, and 1 %, respectively.

Panel A: Propensity score matching					
	Treatment	Control	t-test		
BS	1.7857	1.6187	0.22		
CEODUAL	0.1238	0.1392	0.14		
GENDIV	0.6911	0.6731	0.62		
BI	0.7143	0.6960	0.47		
SIZE	6.1272	5.7523	0.94		
ROA	5.3308	4.8850	0.13		
MB	1.7031	1.5212	0.67		
LEV	0.2552	0.2899	0.42		
ASSETLIQ	1.9756	1.8964	0.95		
ANALYST	1.0327	0.9951	0.91		
IO	63.583	61.128	0.32		
OCF	0.0802	0.0863	0.25		
Variables	Panel B: PSM Regression				
	ESG	lnESG	ENV	SOC	GOV
PROSPECT	−0.1189 (−2.79)***	−0.0167 (−2.07)**	−0.1419 (−2.19)**	−0.1469 (−2.10)**	−0.0928 (−1.98)**
All controls	Included	Included	Included	Included	Included
Industry and Year effects	Yes	Yes	Yes	Yes	Yes
Adj. R ²	0.4673	0.4720	0.4448	0.4589	0.4646
Nobs	1,086	1,086	793	913	1,086

an endogeneity issue arising from the correlation between explanatory variable - *PROSPECT* and the error terms, and therefore bias our estimation. To deal with this endogeneity problem, we employ instrumental regression and re-run the baseline model and employ the industry average business strategy (two-digit SIC industry average - *PROSPECT_{IND}*) as an instrument for the endogenous variable *PROSPECT*. *PROSPECT_{IND}* can be expected to correlate with *PROSPECT* and be uncorrelated with exogenous control variables and the error terms.¹⁰ In the first stage regression, we predict the firm's business strategy (*PROSPECT_{EXP}*) using *PROSPECT_{IND}* and the base set of controls. The predicted business strategy - *PROSPECT_{EXP}* - from the first stage regression is used in the second stage regression instead of *PROSPECT*.

We also conducted multiple post-estimation tests to confirm the validity and robustness of our instrumental variable approach. The high *F*-statistic (112.75) and Cragg-Donald Wald statistic (659.74) indicate strong instruments, while the Durbin-Wu-Hausman χ^2 (34.12) validates the presence of endogeneity. The Anderson LM statistic (438.12) confirms instrument relevance, and the Sargan test ($\chi^2 = 14.53$, $p = 0.5674$) supports instrument validity, showing no correlation with the error term. These results confirm that our model is correctly specified with strong and valid instruments. The results in Table 6 show that after accounting for the endogeneity, the negative association between business strategy and ESG disclosure still persists, confirming our expectation.

4.4. The moderating effect of information asymmetry, corporate governance and policy uncertainty

In this subsection, we first examine hypothesis *H₂* about the impact of information asymmetry on the relationship between business strategy and ESG disclosure. The existence of information asymmetry tends to undermine the efficacy of monitoring and governance mechanisms within firms, consequently exerting a downward pressure on ESG disclosure. Particularly, prospector firms, owing to their heightened dependence on intangible assets and the inherent uncertainties surrounding growth prospects and forthcoming activities, often contend with elevated levels of information asymmetry. This characteristic may, in turn, contribute to a further reduction in their

¹⁰ We acknowledge the caution regarding the use of industry averages as instrumental variables, and we agree that instruments should ideally have a strong economic rationale. However, we note that industry averages are also widely used as instruments in Accounting and Finance research, especially when capturing firm-specific characteristics influenced by broader industry dynamics. For example, several prominent studies in finance have employed industry average to address endogeneity concerns. Examples include Bertrand and Schoar (2003), who use industry averages to instrument for firm-specific governance variables, and Graham et al. (2012), who employ industry-level factors to isolate exogenous variations in firm decisions. These studies demonstrate that industry averages, when chosen appropriately, can provide valid instruments by capturing exogenous variation that is correlated with firm behavior yet uncorrelated with firm-specific shocks. In our study, we selected the industry average as an instrument to reflect exogenous influences on business strategy that are driven by broader industry conditions rather than individual firm characteristics. This approach allows us to address endogeneity concerns while still preserving relevant economic context, consistent with established practices in the literature.

Table 6

Endogeneity – Predicted Business strategy and ESG This table presents the results addressing endogeneity in the relation between business strategy and ESG disclosure scores using the two-stage least squares. The 1st Stage presents the prediction of the business strategy using the *PROSPECT* as the dependent variable. We use the industry average business strategy (two-digit SIC industry average) as an instrument in the first stage regression. The 2nd Stage presents the impact of predicted business strategy on ESG. Particularly, to deal with this endogeneity problem, we employ instrumental regression and re-run the baseline model and employ the industry average business strategy (two-digit SIC industry average - *PROSPECT_{IND}*) as an instrument for the endogenous variable *PROSPECT*. *PROSPECT_{IND}* is expected to correlate with *PROSPECT* and uncorrelated with exogenous control variables and the error terms. In the first stage regression, we predict the firm's business strategy (*PROSPECT_{EXP}*) using *PROSPECT_{IND}* and the base set of controls. The predicted business strategy - *PROSPECT_{EXP}* - from the first stage regression is used in the second stage regression instead of *PROSPECT*. The t-statistics shown in parentheses are based on standard errors that are adjusted for heteroscedasticity and are clustered at the industry and year level. We winsorize continuous variables at the 1 % and 99 % levels. Superscripts *, **, and *** denote significance levels of 10 %, 5 %, and 1 %, respectively.

Variables	1st Stage	2nd Stage				
		ESG	lnESG	ENV	SOC	GOV
<i>PROSPECT_{IND}</i>	0.6738 (15.48)***					
<i>PROSPECT_{EXP}</i>		−0.1119 (−3.16)***	−0.0175 (−2.45)**	−0.1926 (−2.80)***	−0.2061 (−2.63)***	−0.0932 (−2.47)**
All controls	Included	Included	Included	Included	Included	Included
Industry and Year effects	Yes	Yes	Yes	Yes	Yes	Yes
Adj. R ²	0.5326	0.5263	0.5854	0.4322	0.4478	0.4489
Nobs	6,976	6,976	3,976	5,696	6,976	6,976
F-Stat			112.75			
Durbin-Wu-Hausman χ^2			34.12			
Under-identification test (Anderson - LM statistic)			438.12			
Weak identification test: (Cragg-Donald Wald F statistic)			659.74			
Over-identification test Sargan (1958) χ^2			14.53			
p-value for Sargan test			0.5674			

ESG disclosure.

Aligned with existing literature, our assessment of the information environment encompasses two distinct metrics: the financial analyst's forecast error (*AFE*) and the probability of informed trading (*PIN*), consistent with methodologies employed by Yusoff et al. (2023), Chahine et al. (2021), Linnainmaa et al. (2016), Brown et al. (2004), Frankel and Li (2004), and Chang et al. (2006). Specifically, we quantify the *AFE* as the absolute value of the difference between the median analyst quarterly earnings-per-share forecast and the actual earnings per share, divided by the fiscal year end share price. Yusoff et al. (2023) find that firms with a lower forecast error of analysts following them tend to exhibit significantly lower levels of insider buying. This was attributed to the reduced availability of profitable trading opportunities for insiders and a decrease in information asymmetry within such firms. The Probability of Informed Trading (*PIN*)¹¹ is a firm-specific estimate of the likelihood that a trade is initiated by privately informed investors (Brown & Hillegeist, 2007). The model separates trades into buys and sells to estimate the likelihood that trades are informed (i.e., based on private information) versus uninformed. Higher values of *PIN* indicate a higher likelihood that trades are influenced by private information, thus reflecting greater information asymmetry. We selected *PIN* as an appropriate measure of information asymmetry due to its empirical relevance in capturing market conditions, where informed trading may affect price discovery. In our context, firms with high *PIN* values may experience challenges in aligning with ESG objectives, as high information asymmetry can negatively affect transparency and reduce stakeholder trust.

To this end, we split our information environment indicators into high and low categories at the median. High (low) *AFE* and *PIN* indicate higher (lower) levels of information asymmetry. According to hypothesis *H₂*, we expect that when information asymmetry is higher, the negative relationship between prospector business strategy and ESG disclosure will be more pronounced. The findings reported in Table 7 confirm our expectation that the coefficient for prospector business strategy becomes more negative as information asymmetry increases. It is, however, worth noting that the association between prospector business strategy and ESG disclosure is strongly significant for both high and low *AFE* and *PIN*. We interpret these results to show that as information asymmetry increases the score of ESG disclosure becomes less positive and more circumspect. Similarly, we observe a strong and statistically significant association between prospector business strategy and ESG disclosure across all ESG components. Also, the coefficient for prospector business strategy is more negative in weaker information environments. This suggests that the influence of *PROSPECT* on ESG disclosure is more conspicuous for firms characterized by elevated information asymmetry. Therefore, this finding aligns with hypothesis *H₂*.

Second, ESG disclosure might be considered a proxy for the extent to which stakeholder objectives are observed. Thus, a strong corporate governance may be associated with better ESG scores. Nevertheless, prospectors encounter difficulty in monitoring and higher agency costs due to the greater level of uncertainty and lower predictability of operations (Chen & Keung, 2019; Ittner et al.,

¹¹ We obtain the data to compute the probability of informed trading (*PIN*) from <https://terpconnect.umd.edu/~stephenb/>. We thank Stephen Brown for making available this data.

Table 7

Moderating effects of the analyst's forecast error and probability of informed trading on the business strategy and ESG relation. This table examines the moderating influence of (1) the analyst's forecast error (AFE) and (2) probability of informed trading (PIN) associated with the firm on the relation between business strategy and ESG disclosure scores. This table presents the results of a regression between business strategy and ESG, for subgroups of the moderating variable – forecast error (*HighAFE* vs *LowAFE*) and probability of informed trading (*HighPIN* vs *LowPIN*). The *t*-statistics shown in parentheses are based on standard errors that are adjusted for heteroscedasticity and are clustered at the industry and year level. We winsorize continuous variables at the 1 % and 99 % levels. Superscripts *, **, and *** denote significance levels of 10 %, 5 %, and 1 %, respectively.

Variables	Panel A: The Analyst's Forecast Error (AFE)								
	ESG			lnESG			ENV		
	<i>HighAFE</i>	<i>LowAFE</i>	Diff in coeff. & χ^2 (1) vs (2)	<i>HighAFE</i>	<i>LowAFE</i>	Diff in coeff. & χ^2 (3) vs (4)	<i>HighAFE</i>	<i>LowAFE</i>	Diff in coeff. & χ^2 (5) vs (6)
	(1)	(2)		(3)	(4)		(5)	(6)	
<i>PROSPECT</i>	−0.2158 (−5.06)***	−0.1066 (−2.58)**	−0.1092 [23.19]***	−0.0305 (−3.23)***	−0.0155 (−1.69)*	−0.0150 [8.86]**	−0.2533 (−3.95)***	−0.1219 (−1.98)**	−0.1314 [26.87]***
<i>All controls</i>	Included	Included		Included	Included		Included	Included	
<i>Fixed effects</i>	Yes	Yes		Yes	Yes		Yes	Yes	
<i>Adj. R²</i>	0.4348	0.3559		0.4729	0.3873		0.3458	0.2837	
<i>Nobs</i>	3,326	3,353		3,326	3,353		1,901	1,903	
Variables	Panel B: Probability of informed trading (PIN)								
	ESG			lnESG			ENV		
	<i>HighPIN</i>	<i>LowPIN</i>	Diff in coeff. & χ^2 (1) vs (2)	<i>HighPIN</i>	<i>LowPIN</i>	Diff in coeff. & χ^2 (3) vs (4)	<i>HighPIN</i>	<i>LowPIN</i>	Diff in coeff. & χ^2 (5) vs (6)
	(1)	(2)		(3)	(4)		(5)	(6)	
<i>PROSPECT</i>	−0.2643 (−3.41)***	−0.1328 (−1.74)*	−0.1315 [27.12]***	−0.1661 (−3.38)***	−0.0849 (−1.72)*	−0.0812 [19.43]***	−0.2376 (−3.77)***	−0.1437 (−2.26)**	−0.0939 [18.75]***
<i>All controls</i>	Included	Included		Included	Included		Included	Included	
<i>Fixed effects</i>	Yes	Yes		Yes	Yes		Yes	Yes	
<i>Adj. R²</i>	0.3549	0.2901		0.3602	0.3055		0.2492	0.2164	
<i>Nobs</i>	2,720	2,718		3,326	3,353		1,178	1,180	
Variables	Panel C: Probability of informed trading (PIN)								
	ESG			lnESG			ENV		
	<i>HighPIN</i>	<i>LowPIN</i>	Diff in coeff. & χ^2 (1) vs (2)	<i>HighPIN</i>	<i>LowPIN</i>	Diff in coeff. & χ^2 (3) vs (4)	<i>HighPIN</i>	<i>LowPIN</i>	Diff in coeff. & χ^2 (5) vs (6)
	(1)	(2)		(3)	(4)		(5)	(6)	
<i>PROSPECT</i>	−0.2015 (−4.75)***	−0.1208 (−2.85)***	−0.0807 [16.43]***	−0.0283 (−3.05)***	−0.0118 (−1.87)*	−0.0165 [9.14]**	−0.2376 (−3.77)***	−0.1437 (−2.26)**	−0.0939 [18.75]***
<i>All controls</i>	Included	Included		Included	Included		Included	Included	
<i>Fixed effects</i>	Yes	Yes		Yes	Yes		Yes	Yes	
<i>Adj. R²</i>	0.3056	0.2626		0.3227	0.2923		0.2492	0.2164	
<i>Nobs</i>	1,986	2,165		1,986	2,165		1,178	1,180	
Variables	Panel D: Probability of informed trading (PIN)								
	ESG			lnESG			ENV		
	<i>HighPIN</i>	<i>LowPIN</i>	Diff in coeff. & χ^2 (1) vs (2)	<i>HighPIN</i>	<i>LowPIN</i>	Diff in coeff. & χ^2 (3) vs (4)	<i>HighPIN</i>	<i>LowPIN</i>	Diff in coeff. & χ^2 (5) vs (6)
	(1)	(2)		(3)	(4)		(5)	(6)	
<i>PROSPECT</i>	−0.2428 (−3.22)***	−0.1514 (−1.97)**	−0.0914 [17.49]***	−0.1501 (−3.13)***	−0.0981 (−1.96)**	−0.0520 [14.32]***	−0.2376 (−3.77)***	−0.1437 (−2.26)**	−0.0939 [18.75]***
<i>All controls</i>	Included	Included		Included	Included		Included	Included	
<i>Fixed effects</i>	Yes	Yes		Yes	Yes		Yes	Yes	
<i>Adj. R²</i>	0.2413	0.2194		0.2413	0.2264		0.2492	0.2164	
<i>Nobs</i>	1,692	1,693		1,986	2,165		1,178	1,180	

1997; Rajagopalan, 1997; Rajagopalan & Finkelstein, 1992). Thus, in a weak corporate governance setting, agency problems will be amplified for prospector firms and have a deleterious effect on ESG disclosure. We test hypothesis *H*₃ by employing board independence (*BI*) and block ownership (*BO*) as indicators of corporate governance. Specifically, we consider two proxies associated with the extent of oversight over firm activities: the percentage of independent directors on the board (as discussed in Jo & Harjoto, 2011) and the average percentage of outstanding shares held by institutional blockholders (as discussed in Edmans, 2014). A lower presence of independent directors and reduced block ownership collectively indicate a less robust corporate governance environment. We then categorize our corporate governance indicators into high and low classifications based on the median. High (low) *BI* and *BO* signify a

higher (lower) quality of corporate governance. In accordance with hypothesis H_3 , we anticipate that the negative association between the prospector strategy and ESG disclosure scores will be more evident in firms with a weaker firm-level governance environment. The results presented in Table 8 validate our expectation, demonstrating that the coefficient for the prospector business strategy becomes increasingly negative as corporate governance weakens. It is important to note, however, that the relationship between the prospector business strategy and ESG disclosure remains strongly significant for both high and low *BI* and *BO*. We interpret these findings as indicative that as corporate governance improves, the ESG disclosure scores become more positive. Similarly, a robust and statistically significant association is observed between the prospector business strategy and ESG disclosure across all ESG components. This

Table 8

Moderating effects of board independence and block ownership on the business strategy and ESG relation This table examines the moderating influence of (1) Board Independence (BI) and (2) institutional blockholders' ownership (BO) associated with the firm on the relation between business strategy and ESG disclosure scores. This table presents the results of a regression between business strategy and ESG, for subgroups of the moderating variable – board independence (*HighBI* vs *LowBI*) and block ownership (*HighBO* vs *LowBO*). The *t*-statistics shown in parentheses are based on standard errors that are adjusted for heteroscedasticity and are clustered at the industry and year level. We winsorize continuous variables at the 1 % and 99 % levels. Superscripts *, **, and *** denote significance levels of 10 %, 5 %, and 1 %, respectively.

Variables	Panel A: Board Independence (BI)								
	ESG			lnESG			ENV		
	HighBI	LowBI	Diff in coeff. & χ^2 (1) vs (2)	HighBI	LowBI	Diff in coeff. & χ^2 (3) vs (4)	HighBI	LowBI	Diff in coeff. & χ^2 (5) vs (6)
	(1)	(2)		(3)	(4)		(5)	(6)	
PROSPECT	−0.1178 (−2.64)***	−0.2372 (−5.45)***	0.1194 [24.17]***	−0.0101 (−1.73)*	−0.0389 (−3.55)***	0.0288 [10.16]***	−0.1348 (−2.03)**	−0.2783 (−4.37)***	0.1435 [27.12]***
All controls	Included	Included		Included	Included		Included	Included	
Fixed effects	Yes	Yes		Yes	Yes		Yes	Yes	
Adj. R ²	0.4049	0.6066		0.4496	0.6694		0.3251	0.4853	
Nobs	2,430	2,276		2,430	2,276		1,337	1,335	
	SOC			GOV					
	HighBI	LowBI	Diff in coeff. & χ^2 (7) vs (8)	HighBI	LowBI	Diff in coeff. & χ^2 (9) vs (10)			
	(7)	(8)		(9)	(10)				
PROSPECT	−0.1486 (−1.89)*	−0.2835 (−3.72)***	0.1349 [27.01]***	−0.0829 (−1.74)*	−0.1841 (−3.63)***	0.1012 [19.84]***			
All controls	Included	Included		Included	Included				
Fixed effects	Yes	Yes		Yes	Yes				
Adj. R ²	0.3309	0.4931		0.3423	0.5107				
Nobs	1,920	1,918		2,430	2,276				
Variables	Panel B: Block ownership (BO)								
	ESG			lnESG			ENV		
	HighBO	LowBO	Diff in coeff. & χ^2 (1) vs (2)	HighBO	LowBO	Diff in coeff. & χ^2 (3) vs (4)	HighBO	LowBO	Diff in coeff. & χ^2 (5) vs (6)
	(1)	(2)		(3)	(4)		(5)	(6)	
PROSPECT	−0.0974 (−2.22)**	−0.1765 (−4.06)***	−0.0791 [14.05]***	−0.0115 (−1.85)*	−0.0242 (−2.51)**	−0.0127 [7.11]*	−0.1161 (−2.07)**	−0.2067 (−3.26)***	−0.0906 [16.17]***
All controls	Included	Included		Included	Included		Included	Included	
Fixed effects	Yes	Yes		Yes	Yes		Yes	Yes	
Adj. R ²	0.3197	0.5945		0.3477	0.6403		0.2506	0.4758	
Nobs	3,284	3,279		3,284	3,279		1,875	1,872	
	SOC			GOV					
	HighBO	LowBO	Diff in coeff. & χ^2 (7) vs (8)	HighBO	LowBO	Diff in coeff. & χ^2 (9) vs (10)			
	(7)	(8)		(9)	(10)				
PROSPECT	−0.1201 (−1.98)**	−0.2175 (−2.82)***	−0.0974 [17.85]***	−0.078 (−1.89)*	−0.1222 (−2.73)***	−0.0442 [13.78]***			
All controls	Included	Included		Included	Included				
Fixed effects	Yes	Yes		Yes	Yes				
Adj. R ²	0.2523	0.4867		0.2610	0.5062				
Nobs	2,680	2,677		3,283	3,280				

Table 9

The impact of policy uncertainty and financial reporting uncertainty.

Variables	Panel A: Economic policy uncertainty (EPU)								
	ESG			lnESG			ENV		
	HighEPU	LowEPU	Diff in coeff. & χ^2 (1) vs (2)	HighEPU	LowEPU	Diff in coeff. & χ^2 (3) vs (4)	HighEPU	LowEPU	Diff in coeff. & χ^2 (5) vs (6)
	(1)	(2)		(3)	(4)		(5)	(6)	
PROSPECT	−0.1978 (−4.63)***	−0.1046 (−2.42)**	−0.0932 [18.76]***	−0.0211 (−2.97)***	−0.0127 (−1.84)*	−0.0084 [5.65]*	−0.2389 (−3.64)***	−0.1239 (−2.13)**	−0.1150 [22.94]***
All controls	Included	Included		Included	Included		Included	Included	
Fixed effects	Yes	Yes		Yes	Yes		Yes	Yes	
Adj. R ²	0.4966	0.3014		0.5391	0.3254		0.3981	0.2418	
Nobs	2,768	2,781		2,768	2,781		1,576	1,579	
	SOC			GOV					
	HighEPU	LowEPU	Diff in coeff. & χ^2 (7) vs (8)	HighEPU	LowEPU	Diff in coeff. & χ^2 (9) vs (10)			
	(7)	(8)		(9)	(10)				
PROSPECT	−0.2433 (−3.29)***	−0.1233 (−2.04)**	−0.1200 [24.76]***	−0.1578 (−3.19)***	−0.0898 (−1.98)**	−0.0680 [15.43]***			
All controls	Included	Included		Included	Included				
Fixed effects	Yes	Yes		Yes	Yes				
Adj. R ²	0.4068	0.2433		0.4225	0.2576				
Nobs	2,266	2,267		2,768	2,781				
Variables	Panel B: Financial reporting uncertainty (FRU)								
	ESG			lnESG			ENV		
	HighFRU	LowFRU	Diff in coeff. & χ^2 (1) vs (2)	HighFRU	LowFRU	Diff in coeff. & χ^2 (3) vs (4)	HighFRU	LowFRU	Diff in coeff. & χ^2 (5) vs (6)
	(1)	(2)		(3)	(4)		(5)	(6)	
PROSPECT	−0.1571 (−3.51)***	−0.0976 (−2.28)**	−0.0595 [12.97]***	−0.0215 (−2.21)**	−0.0136 (−1.71)*	−0.0079 [6.31]*	−0.1865 (−2.71)***	−0.1141 (−1.95)*	−0.0724 [16.93]***
All controls	Included	Included		Included	Included		Included	Included	
Fixed effects	Yes	Yes		Yes	Yes		Yes	Yes	
Adj. R ²	0.5234	0.3102		0.5695	0.3478		0.5665	0.2582	
Nobs	3,432	3,435		3,432	3,435		1,957	1,956	
	SOC			GOV					
	HighFRU	LowFRU	Diff in coeff. & χ^2 (7) vs (8)	HighFRU	LowFRU	Diff in coeff. & χ^2 (9) vs (10)			
	(7)	(8)		(9)	(10)				
PROSPECT	−0.1883 (−2.46)***	−0.1203 (−1.73)*	−0.0680 [14.62]***	−0.1106 (−2.32)**	−0.0762 (−1.78)*	−0.0344 [11.73]***			
All controls	Included	Included		Included	Included				
Fixed effects	Yes	Yes		Yes	Yes				
Adj. R ²	0.4162	0.2523		0.4413	0.2649				
Nobs	2,804	2,802		3,432	3,435				

This table examines the moderating influence of (1) Economic policy uncertainty (EPU) and (2) Financial reporting uncertainty (FRU) associated with the firm on the relation between business strategy and ESG disclosure scores. This table presents the results of a regression between business strategy and ESG, for subgroups of the moderating variable – Economic policy uncertainty (*HighEPU* vs *LowEPU*) and financial reporting uncertainty (*HighFRU* vs *LowFRU*). The *t*-statistics shown in parentheses are based on standard errors that are adjusted for heteroscedasticity and are clustered at the industry and year level. We winsorize continuous variables at the 1 % and 99 % levels. Superscripts *, **, and *** denote significance levels of 10 %, 5 %, and 1 %, respectively.

implies that the impact of *PROSPECT* on ESG disclosure is particularly pronounced in firms characterized by weak corporate governance, thus corroborating hypothesis *H*₃.

Finally, given the significant influence of uncertainties at both country and firm levels in shaping a firm's operational environment, as outlined by [Avramov, Cheng, Lioui, and Tarelli \(2022\)](#), our study examines the consequences of uncertainty on the relationship between corporate strategy and ESG disclosure, as proposed in hypothesis *H*₄. To gauge uncertainty, we utilize two proxies - one at the country level, Economic Policy Uncertainty (*EPU*), and another at the firm level, Financial Reporting Uncertainty (*FRU*).

The Economic Policy Uncertainty (*EPU*) index, developed by [Baker et al. \(2016\)](#), is a composite measure designed to assess the level of uncertainty and volatility surrounding economic policies, encompassing abrupt changes. It comprises three key components: the frequency of news articles in prominent newspapers containing terms related to the economy, policy uncertainty, and taxation; the number of federal tax code provisions scheduled for expiration in the near future, introducing uncertainty about forthcoming tax policies; and the degree of stock market volatility, often indicative of increased financial market uncertainty. Conversely, the financial reporting uncertainty index is computed as the percentage of uncertainty-related financial terms to the total number of words in the 10-K Report. As demonstrated by [Bae et al. \(2023\)](#), total words serve as a proxy for informational complexity. Their research reveals that, in the short run following Form 10-K filings, heightened complexity in these filings results in increased uncertainty. Additionally, [Bae et al. \(2023\)](#) find that investors value both the complexity of information and the richness of information content in 10-K reports.

We classify our uncertainty indicators into high and low categories based on the median. High (low) *EPU* and *FRU* levels indicate a higher (lower) quality of uncertainty. In alignment with hypothesis *H*₄, we expect that the negative correlation between the prospector strategy and ESG disclosure scores will be more pronounced in firms experiencing higher uncertainty. The findings presented in [Table 9](#) confirm our expectations, revealing that the coefficient for the prospector business strategy becomes increasingly negative as uncertainty levels rise. Furthermore, we observe that the relationship between the prospector business strategy and ESG disclosure remains strongly significant for both high and low *EPU* and *FRU*. Similarly, a robust and statistically significant association is identified between the prospector business strategy and ESG disclosure across all ESG components. This suggests that the impact of *PROSPECT* on ESG disclosure is particularly noteworthy in firms operating amid heightened uncertainty, thereby substantiating hypothesis *H*₄. Additionally, the results indicate that increased uncertainty is linked to reduced engagement with ESG objectives by prospector firms, supporting our expectations and aligning with the argument put forth by Pastor and Veronesi (2012) that policy uncertainty exacerbates firm risk.

5. Conclusion

This paper investigates the connection between firms' business strategy and ESG disclosure scores. Our empirical analysis finds support for a negative relationship between firms following a prospector strategy and ESG disclosure, implying that firms pursuing innovation and growth prospects, who tend to be exposed to higher uncertainty and greater business and default risk, have less regard to stakeholder and less likely to prioritize sustainability and corporate social responsibility initiatives than other strategic archetypes. As a result, they are associated with lower ESG disclosure scores. This finding provides a better understanding of business strategies and their relationship with firms' resilience to long-term environmental, social, and governance risks and corporate sustainability. However, this effect is alleviated if the firm is more transparent to outside investors and regulators, and operate in better information and governance environments. Also, we show that during periods of increased policy uncertainty, the negative relationship between prospector strategy and ESG disclosure scores is even more pronounced.

Overall, our findings are an important step in understanding how pursuit of innovation and growth prospects affects ESG disclosure scores and will be of interest to firm managers, investors, and market regulators who have an interest in how strategic behavior of businesses affects their pursuit of a sustainability agenda. Firm managers need to be aware of the impact of their strategy on their ESG disclosure scores. If they are pursuing a prospector strategy, they may need to consider implementing initiatives that improve their ESG performance. This may include investing in more sustainable practices, improving labor conditions, and being more transparent about their operations. The negative relationship between the prospector strategy and ESG disclosure scores has important implications for investors. Investors who prioritize sustainability should seek out companies with a focus on ESG considerations and avoid those with a prospector strategy. Conversely, investors who are focused on searching out firms seeking to build and exploit competitive advantages in their product markets, may find that companies with a prospector strategy offer more attractive investment opportunities.

For policy-making bodies, our study highlights the need for greater regulation and oversight in industries that are particularly susceptible to low ESG disclosure scores. This supports the growing recognition of the need for policy interventions to encourage companies to adopt more sustainable and responsible business practices. Policy makers can also play a role in promoting transparency and disclosure in the ESG rating process. This would help ensure that companies are held accountable for their environmental and social impacts and that investors have access to relevant and reliable information when making investment decisions.

Appendix 1. Variable definitions

Variables	Acronym	Description	Data sources
1. Dependent variable			
Environmental, Social, and Governance disclosure	<i>ESG</i>	Environmental, Social, and Governance disclosure of a firm in year <i>t</i> , ranging from 0.1 to 100.	Bloomberg
	<i>lnESG</i>	The natural logarithm of ESG of a firm in year <i>t</i> .	Bloomberg
Environmental disclosure	<i>ENV</i>	Environmental disclosure of a firm in year <i>t</i> , ranging from 0.1 to 100.	Bloomberg
Social disclosure	<i>SOC</i>	Social disclosure of a firm in year <i>t</i> , ranging from 0.1 to 100.	Bloomberg
Governance disclosure	<i>GOV</i>	Governance disclosure of a firm in year <i>t</i> , ranging from 0.1 to 100.	Bloomberg
2. Firm-level variables			
Business Strategy	<i>PROSPECT</i>	A dummy variable which takes the value of one for prospector-type firms and zero for defender firms and analyser firms	(Ittner et al. 1997; Miles and Snow, 1978, 2003);
Firm size	<i>SIZE</i>	The natural logarithm of the firm's total assets in year <i>t</i> -1.	Compustat
Analyst Forecast Error	<i>AFE</i>	The absolute value of the difference between the median analyst quarterly earnings-per-share forecast and the actual earnings per share, divided by the fiscal year end share price.	I/B/E/S
Analyst coverage	<i>ANALYST</i>	Analyst coverage in year <i>t</i> -1, estimated as the natural logarithm of 1 plus the average number of analysts following the firm during the fiscal year.	I/B/E/S
Return on assets	<i>ROA</i>	The ratio of net income to total assets in year <i>t</i> -1.	Compustat
Market-to-book	<i>MB</i>	The ratio of market to book value in year <i>t</i> -1.	Compustat
Leverage	<i>LEV</i>	The ratio of long-term debt to total assets in year <i>t</i> -1.	Compustat
Asset liquidity	<i>ASSETLIQ</i>	The ratio of current assets to current liabilities in year <i>t</i> -1.	Compustat
Operating cash flow	<i>OCF</i>	Operating cash flow scaled by total assets in year <i>t</i> -1.	Compustat
Board size	<i>BS</i>	The natural logarithm of number of directors on a corporate board in year <i>t</i> -1.	BoardEx
CEO duality	<i>CEODUAL</i>	A dummy variable equals one (zero) if a firm's CEO is also chairman of the board in year <i>t</i> -1.	BoardEx
Gender diversity	<i>GENDIV</i>	A dummy variable equals one (zero) if there is at least one women director on a corporate board in year <i>t</i> -1.	BoardEx
Board independence	<i>BI</i>	The number of independent directors on a corporate board in year <i>t</i> -1.	ISS
Block ownership	<i>BO</i>	The ownership of institutional blockholders in year <i>t</i> -1 is calculated as the proportion of shareholders owning more than 5% of the listed stock during fiscal year <i>t</i> -1.	Thomson Reuters Institutional 13F
Probability of informed trading	<i>PIN</i>	Probability of insider trading obtained from https://terpconnect.umd.edu/~stephenb/	https://terpconnect.umd.edu/~stephenb/
Financial reporting uncertainty	<i>FRU</i>	The percentage of uncertainty-related financial terms to total number of words in the 10-K Report	WRDS SEC

Appendix 2. Correlation matrix

This table presents the Pearson's coefficient of correlation between the variables used in this study. The 1 %, 5 %, and 10 % significance levels are denoted by ***, ** and *. We present the variables definitions in [Appendix 1](#).

		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
<i>ESG</i>	1	1.00																
<i>GOV</i>	2	0.73**	1.00															
<i>SOC</i>	3	0.84***	0.64***	1.00														
<i>ENV</i>	4	0.91***	0.69***	0.70***	1.00													
<i>PROSPECT</i>	5	−0.16***	−0.13***	−0.04	−0.06*	1.00												
<i>BS</i>	6	0.13***	0.18***	0.32***	0.24***	−0.07*	1.00											
<i>CEODUAL</i>	7	−0.09**	−0.08**	0.10***	0.05	−0.04	−0.22***	1.00										
<i>GENDIV</i>	8	0.15***	0.24***	0.14***	0.21***	0.05	0.02	0.09**	1.00									
<i>BI</i>	9	0.13***	0.32***	0.18***	0.23***	−0.07*	0.05	0.12***	−0.16***									
<i>SIZE</i>	10	0.48***	0.47***	0.43***	0.42***	0.10***	0.19***	0.05	−0.23***	1.00								
<i>ROA</i>	11	0.07*	0.06*	0.08**	0.05	−0.08**	0.04	0.03	−0.09**	0.09**	1.00							
<i>MB</i>	12	0.04	0.04	0.04	0.06*	−0.06*	0.03	0.03	−0.03	0.03	−0.09**	1.00						
<i>LEV</i>	13	−0.21***	−0.21***	−0.17***	−0.21***	0.07*	0.07*	0.04	−0.21***	0.20***	0.08**	0.02	1.00					
<i>ASSETLIQ</i>	14	−0.20***	−0.19***	−0.16***	−0.23***	−0.14***	−0.11***	−0.07*	0.17***	0.17***	−0.11***	0.11***	−0.06*	1.00				
<i>OCF</i>	15	−0.03	−0.05	−0.02	−0.06*	0.03	0.07	−0.03	−0.02	−0.07*	−0.04	0.02	−0.05	−0.05	1.00			
<i>ANALYST</i>	16	0.18***	−0.12***	−0.17***	−0.21***	−0.04	0.11***	−0.04	−0.12***	0.12***	−0.07**	0.08**	−0.04	−0.07**	0.12***	1.00	1.00	
<i>IO</i>	17	0.08**	−0.09**	−0.05	−0.08**	−0.13***	0.05	−0.05	−0.06*	0.06*	−0.08**	0.01	0.06*	−0.05	0.11***	0.04	0.06*	1.00

Appendix 3. Business strategy composite measure

We employ the methodologies delineated by Ittner et al. (1997) and Miles and Snow (1978, 2003) to create a discrete composite metric that captures and characterizes a company's business strategy.

Business strategy composite measure	Variable measurement
1). R&D to sale (RDSS) <i>A company's inclination towards pursuing new products</i>	The five-year moving average of the research and development expenditure-to-sales ratio.
2). Employee to sale (EMPS5) <i>A company's proficiency in efficiently producing and distributing products and services</i>	The five-year moving average of the employee-to-sales ratio.
3). Change in total revenue (REV5) <i>A company's past growth performance or investment prospects</i>	The five-year moving average of the annual percentage change in total sales.
4). Marketing to sale (SGA5) <i>A company's emphasis on utilizing new products and services</i>	The five-year moving average of the selling, general, and administrative expenses-to-sales ratio.
5). Employee fluctuations (EMP5) <i>A company's organizational stability and consistency</i>	The five-year moving average of the standard deviation in the total number of employees.
6). Capital intensity (CAP5) <i>A company's dedication to technological efficiency and advancement</i>	The five-year moving average of capital intensity, computed as the net property, plant, and equipment-to-total assets ratio

Data availability

Data will be made available on request.

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