Spillover effects of green IPOs*

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Abstract

When a green firm goes public, who pays the price? We show that the environmental profile of an IPO reshapes the competitive landscape of its entire industry. Using 545 completed U.S. IPOs over 2007–2024 and a propensity-score-matched set of rivals, we combine a ClimateBERT-based measure of the climate commitment disclosed in the prospectus with rivals' carbon emissions from Asset4/Refinitiv. Industry rivals suffer significant negative abnormal returns around an IPO, and these losses sharply intensify when the entrant credibly signals strong climate commitment. Crucially, the shock is deeply uneven: green incumbents prove remarkably resilient, while their high-emission peers bear the brunt of the value destruction. Finally, using abnormal trading volume as a proxy for investor attention, we trace this divergence to an attention-driven reallocation, as investors actively tilt away from brown rivals toward greener ones.

Keywords: Green IPOs, Brown IPOs, Spillover Effects, Sustainability.
JEL Codes: G12; G24; G32; Q50

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1 Introduction

Financial aspects of climate change have gained significant importance in recent years with the emergence of the fast-growing field of climate finance (e.g., Giglio et al. (2021)). While scholars and policymakers have dedicated growing attention to measuring Environmental, Social and Governance (ESG) risks over the last decades, attention is now primarly on the environmental dimension, given the effects that climate change is having on the economies worldwide. Starting form the Paris COP 21 climate agreement of December 2015, with 195 signatories committing to limit global warming to well below 2 °C above preindustrial levels, investors are increasingly incorporating the climate-change issue in their financial decisions. For instance, institutional investors are increasingly tracking the greenhouse gas emissions of listed firms and forming coalitions such as Climate Action 100+ to engage with companies to reduce their carbon footprint[1].

In recent years, the IPO market has witnessed a growing number of companies going public on an explicit sustainability or environmental mandate across different industries. For instance, On May 2, 2019, Beyond Meat went public at $25 per share. By the end of its first trading day, the stock had surged to $65.75 — a 163% return that made it the best-performing large IPO debut in nearly two decades. The company sold plant-based burgers. It had never turned a profit. Yet within 42 days, Tyson Foods — the largest meat producer in the United States — announced an entirely new brand dedicated to alternative proteins. Within 30 days, Nestlé, publicly announced its own plant-based burger as a direct competitive response. Another relevant example is the IPO of Rivian Automotive, which debuted on Nasdaq on November 21, 2021, at a valuation of approximately $100 billion — exceeding that of both General Motors and Ford on the same day the company had delivered fewer than 200 vehicles. That afternoon, GM CEO Mary Barra publicly declared her company "so undervalued" and within weeks General Motors raised its electric vehicle investment commitment by 75%, to $35 billion.

Besides this growing number of "green" IPOs, policymakers had moved toward mandatory disclosure of climate risk and environmental compliance for issuing firms, responding to investors' demand for greater transparency at the moment of the IPO. This regulatory push, however, has recently reversed: after adopting landmark climate-disclosure rules in 2024, the SEC proposed in May 2026 to rescind them entirely [2], as part of a broader, politically charged "ESG backlash"[3]. Climate-related disclosure in IPO prospectuses and registration statements has thus moved to the center of the storm, turning the question of whether investors actually price such information into a contested policy issue.

In the past, scholars have already provided robust evidence that IPOs induce a strong

[1] http://www.climateaction100.org/

[2] SEC, Press Release 2026-49, May 29, 2026.

[3] See Joselow, M. (2026), "S.E.C. Proposes to Kill Climate Change Disclosure Rule," *The New York Times*, May 29.

market reaction to industry incumbents. The general consensus is that industry competitors experience negative stock returns when an IPO is announced, due to competitive dynamics (Hsu et al., 2010; Chemmanur and He, 2011; Chod and Lyandres, 2011). In recent years, there has been a renewed interest in IPO spillover effects research, broadening its scope into previously unexplored dimensions. For instance, Aghamolla and Thakor (2022) find that a private firm is significantly more likely to go public after observing the recent IPO of an industry competitor. Chyz et al. (2023) use firms' tax policies as a powerful setting to identify whether incumbent firms respond to a significant IPO in their industry, and provide evidence that incumbent firms adjust their effective tax rates (ETRs) in the three years following a significant IPO entrance to the industry. More recently, Jiang et al. (2025) document a significant increase in the valuation of incumbent firms when their patent portfolio exhibits a higher degree of similarity to the IPO firm.

In parallel with the renewed attention to IPO peer effects, recent years have also witnessed a growing stream of research exploring spillover effects through the lens of sustainable finance. Cao et al. (2019) find that when a focal al firm announces an implementation of new CSR activities, competitors tend to experience a negative CAR around the announcement date, and they are likely to increase their own CSR activities in the following years. The findings reveal the existence of a CSR spillover effect at an intra-industry level, influencing both companies strategic decision and investors reaction. Similarly, Li and Wang (2022) analyze the CSR spillover effects across companies geographically close to each other, and provide robust evidence that a firm's CSR investment is significantly and positively sensitive to the CSR investment of firms in the same area.

Despite these parallel advancements, the intersection of CSR and IPO spillover effects remains largely unexplored, leaving open the question of whether the green or brown nature of the IPO firm modulates the spillover effect on industry rivals. Our study aims to fill this gap in extant literature by addressing the following research question. How does the market reaction of industry rivals to an IPO vary according to the environmental profile of both the issuing firm and the rival firms?

Although climate finance is a relatively recent field, several works have empirically addressed the question whether firms CO2 emissions level is reflected in asset prices, with mixed results. While a number of studies show that a carbon premium do exists (Bolton and Kacperczyk, 2021, 2023; Hsu et al., 2023), others provide evidence of green stocks outperforming brown stocks when investors are particularly concerned about climate. Notably, Pástor et al. (2021) theorize that when climate concern rises, investor "green taste" increases, i.e.. investors tilt their portfolio towards green assets. The PST model is empirically confirmed by Pástor et al. (2022) and Ardia et al. (2023), supporting the idea that exogenous events linked to climate concerns might change the investors taste for green assets.

Coherently, a disruptive market event such as an IPO, might trigger different market reaction among industry rivals according to both the climate commitment level of the IPO and the environmental footprint (i.e., green VS brown) of the rivals. Potentially, the IPO prospectus is the first public disclosure of the environmental profile and climate commitment of the newly issuing firm, and as such it might constitute an exogenous "green shock" within the industry of the kind theorized by Pástor et al. (2021), causing an unexpected shift in the investors' awareness of the environmental dimension of an industry. When a highly climate-committed IPO goes public, it not only enters the product market as a new competitor, but also reveals a new environmental benchmark that investors can use to reassess the relative greenness of all incumbent rivals (Flammer, 2013, 2015), potentially triggering a portfolio reallocation toward environmentally superior firms.

To our knowledge, the present research is the first to address the market reaction of industry rivals to an IPO in their industry, according to the environmental profile of both the IPO firms and their competitors, hence, through the lens of sustainable finance. To address our research question, we follow the method of Hsu et al. (2010) and select 545 IPO events occurring in USA between 2007 and 2024. We then collect from Refinitiv all firms that have been listed in NASDAQ and NYSE in the same period. A company is labeled as *rival* if it shares the same two-digit SIC code as the IPO event, and if it were publicly listed at least 3 years before the IPO event. SIC codes have been manually collected form the S-1 filings. Financial and accounting variables of IPOs are form Jay Ritter's database or from the S-1 filings, while financial and accounting variables for rival and control firms are from Refinitiv. Finally, we follow Li and Zhang (2021) and use a Propensity Score Model (PSM) to match rival firms and control firms for each IPO event in our sample.

In order to classify an IPO as green or brown, we first download all the IPO prospectuses (S-1 filing) from the SEC Edgar database. Then we construct our measure of the IPO greenness by using the ClimateBERT language model (Webersinke et al., 2021). Notably, we apply the trained sentiment model based on ClimateBERT (Bingler et al., 2024) to all the climate related paragraphs in each IPO prospectus. Our sentiment analysis considers both the content and tone of the paragraph. A paragraph is labeled as an *opportunity* if it mainly discusses business opportunities or the positive impacts of mitigating or adapting to climate change. considered *neutral* if it is about facts without putting them into a positive or negative perspective. Lastly, it is labeled a *risk* if it mainly talks about business risks or the negative impacts of climate change. To disentangle between green and brown firms, we follow recent literature in the field of climate finance (Ardia et al., 2023) and use the GHG emission intensity (Scope1 & Scope 2 divided by revenues) from Asset4/Refinitiv database as our primary measure of the carbon footprint of listed companies. Firms are classified as green if their emissions level is below the 25th percentile, and brown if above the 75th percentile or if they do not disclose their GHG emissions.

We find that IPO rivals experience a significant negative Cumulative Abnormal Return (CAR) around an IPO event in their industry. This negative reaction is amplified when the issuing firm exhibits a stronger climate commitment in its prospectus. However, when we distinguish between green and brown rivals, we find that green rivals suffer significantly milder losses tha brown rivals following the listing of a high-climate-commitment IPO. Our findings suggest that investors anticipate that incumbent firms will need to undertake costly environmental investments to close the competitive gap and match the new benchmark set by the green entrant — a burden that falls disproportionately on brown rivals, which stand furthest from that benchmark. To shed light on the mechanism driving this differential response, we exploit abnormal trading volume as a proxy for investor attention (Barber and Odean, 2008). We find that green IPOs generate a significant spike in abnormal trading volume among green industry rivals in the days surrounding the listing event, consistent with investors directing attention — and buying pressure — toward green assets. This attention-driven reallocation partially offsets the competitive shock faced by green rivals, explaining why their cumulative abnormal returns are significantly less negative than those of brown rivals exposed to the same IPO event.

Our contribution to the extant literature is threefold. First, we contribute to the existing literature on the spillover effect of IPO (Hsu et al., 2010; Li and Zhang, 2021) by examining the environmental dimension as a novel moderator of intra-industry spillover effects. To the best of our knowledge, we are the first to provide evidence that the climate commitment of an IPO shapes the market reaction of industry rivals. Secondly, we contribute to the literature on CSR peer effects (Cao et al., 2019; Li and Wang, 2022) by documenting that spillover effects along the environmental dimension operate through an investor attention channel, as evidenced by the significant spike in abnormal trading volume among green rivals around green IPO events. This finding complements the competitive pressure channel and highlights the role of market participants in transmitting environmental standards across firms within the same industry. Lastly,we contribute to the recent and growing literature on climate finance and asset pricing (Pástor et al., 2021, 2022; Bolton and Kacperczyk, 2021, 2023; Ardia et al., 2023) by providing casual evidence that a "green IPO" may act as an exogenous "green shock" that could induce a repricing of the entire industry along the environmental dimension. Our findings show that this repricing is not uniform and it disproportionately penalizes brown incumbents compared to green incumbents, consistent with a portfolio tilting towards green assets (Pástor et al., 2021).

Our findings carry relevant implications for policymakers, firms, and investors. For policymakers, our results provide direct empirical support for the growing trend toward mandatory climate-related disclosures in IPO prospectuses. The evidence that a green IPO generates measurable negative externalities for high-emission incumbents suggests that environmental transparency at the moment of listing produces broader market discipline effects, incentivizing the entire industry to internalize climate-related competitive risks. Against the backdrop of the recent regulatory retreat, these findings speak directly to the ongoing policy debate. Our evidence indicates that the information conveyed by environmental disclosure is value-relevant and is priced by investors almost immediately, well beyond the issuing firm itself. This suggests that scaling back mandatory climate-related disclosure would deprive market participants of information they demonstrably use, and would weaken the market-discipline channel through which environmental standards diffuse across an industry. We therefore argue that there is a sound, market-based rationale for policymakers to stay the course charted in recent years — sustaining requirements that compel firms to disclose both their environmental footprint and their strategies to mitigate climate change — rather than reversing it. Instead, firms and managers, should be aware that the arrival of a highly climate-committed IPO in an industry effectively resets the environmental benchmark against which all incumbents are evaluated by investors. This implies that maintaining a proactive environmental posture is not merely a matter of regulatory compliance or reputational management, but a source of competitive resilience: firms that are already green at the time of a disruptive green IPO entry are significantly shielded from the value destruction experienced by their brown peers. Finally, for investors, our findings document that the environmental classification of incumbent firms is a value-relevant dimension around IPO events. Green rivals exhibit significantly lower negative CARs. This pattern suggests that portfolio strategies that overweight green incumbents in industries with high IPO activity — particularly when such IPOs exhibit strong climate commitment — may deliver superior risk-adjusted returns during the listing window.

The remainder of this paper is organized as follows. Section 2 describes the theoretical framework. Section 3 describes the data and the methodology. Section 4 reports the results of our analysis channels, and Section 5 concludes the paper.

2 Theoretical framework

2.1 IPOs and industry rivals market reaction

Starting with Slovin et al. (1995), a well-established branch of finance literature has documented that a company's decision to go public generates significant externalities for its industry peers. Notably, Slovin et al. (1995) show that rivals of firms that carry out an IPO experience a significant negative effect on the share price, arguing that the loss in the industry is due to the unfavorable information conveyed by an IPO announcement, rather than competitive considerations. The empirical results of Hsu et al. (2010) reveal that industry competitors experience negative CARs the announcement of a new IPO in their industry, but the results are consistent with the view that private companies may decide to go public to gain additional competitive advantage over industry rivals. Chemmanur and He (2011) and Chod and Lyandres (2011) reach similar conclusions, showing that the erosion in rivals' market value is due to the increased competitiveness gained by the IPO. A more nuanced perspective is provided in the work by Spiegel and Tookes (2020) who build a dynamic model and show that losses of rival firms are actually driven by industry trends rather than the competitive advantage gained by the IPO. The rationale behind is that private companies decide to go public when "consumers become easier to steal". Thus, rivals' profits get squeezed as consumers perceive industry products as increasingly homogeneous after the IPO.

The only notable exception to this negative pattern documented so far in the literature is provided by Li and Zhang (2021), who investigate the price reaction of industry competitors in the emerging Chinese IPO market, and find that, on average, IPO rivals earn a positive 12-day CAR of 1.21% . However, the authors attribute this result to the structural peculiarities of the Chinese market — including severe IPO supply constraints and institutional features without parallel in developed markets — making it an exception that reinforces rather than undermines the general pattern.

The evidence reviewed above is almost exclusively drawn from the US market, with the only exception of Li and Zhang (2021), leaving up the question whether similar patterns can be found in other institutional environments. This leads us to our first hypothesis:

Hypothesis 1: *Industry rivals experience a negative market reaction to completed IPOs in their industry.*

2.2 Raising the bar: Green IPOs, competitive pressure, and the cost of environmental catch-up

Against this backdrop, IPOs that shows a greater engagement in environmental activities with respect to their industry peers might further amplify the competitive pressure on incumbent firms. Grounded on Porter et al. (1996), who state that efforts to reduce pollution do not only reduce a company's environmental footprint but also enhance its competitiveness, Flammer (2013, 2015) further extend the theoretical framework arguing that the value of environment-as-a-resource might depend on both firm-level CSR intensity and the prevailing industry norm of environmental CSR. Indeed, exogenous factors such as environmental regulations, media attention to the environment or customers' sensitivity to environmental issues might set the institutional norm, and firms falling below the new environmental benchmark eventually face a competitive disadvantage. In this context, a green IPO might act as a credible exogenous factor that set the new institutional norm that incumbents are expected to match. Since the content of the prospectus is the the most relevant source of information for investors (Hanley and Hoberg, 2010), the level of climate commitment of the IPO as reported in the prospectus may exacerbates the negative CARs of industry rivals due to the additional competitive pressure induced by the environmental commitment of the IPO. Previous empirical findings of Cao et al. (2019) support this view. The authors show that the marginal passage of a CSR shareholder proposal at the focal firm generates negative CARs for industry rivals around the voting date. Additional results show that when a voting firm marginally passes a CSR proposal, its peer firms' CSR practices in the following year improve significantly, possibly because of competitive pressure created by the voting firms.

The competitive channel, however, only tells half the story. Even if rivals were to successfully match the environmental benchmark set by the green IPO, the cost of doing so may itself be a source of value destruction in the eyes of investors. Investments to improve CSR activities might be a signal of agency problem inside the company, as shareholders could see this strategy as a form of wasteful spending, where CSR primary benefits managers who, at the expense of shareholders, earn a good reputation among key stakeholders (Bénabou and Tirole, 2010; Cheng et al., 2023; Masulis and Reza, 2015). This investor scepticism towards CSR spending finds direct empirical support in Di Giuli and Kostovetsky (2014) and Krüger (2015). Notably, Krüger (2015) empirically address the question of whether positive and negative CSR events are matters of shareholders value. Results reveal that investors negatively react to the release of positve CSR news, suggesting that they do not appreciate the implementation of new CSR policies because are costly and the expected benefits from implementing such policies do not cover the costs. Notably, the authors find a 21-day mean CAR of -250 basis points associated with positive environmental events for companies in which agency problems are more likely to be present.

Drawing both on the competition channel and on the agency-cost view of CSR spending, we formulate the following hypothesis:

Hypothesis 2: *Green IPOs exacerbates the negative market reaction of industry rivals*

2.3 Heterogeneous rival reactions: green versus brown

From the perspective of the natural-resource-based view of the firm (Hart, 1995; Hart and Dowell, 2011), firms developing a green strategy may generate a sustainable and less-imitable competitive advantage that could make them resilient to negative market shocks. In this framework, the heterogeneity of resources in a firm is a driver of competitive differences within an industry; those companies that foster resources in support of environmental awareness are likely to gain competitive advantages and hence achieve higher profits. Over the past decade, a number of studies have examined whether CSR is value-enhancing, with largely supportive but not unanimous evidence (see Gillan et al., 2021).For instance, Gao and Zhang (2015) and Ferrell et al. (2016) find a positive correlation between firm-level ESG/CSR scores and Tobin's q. Chang et al. (2019) also find that firms value increases in their CSR/ESG activities, demonstrating that an additional dollar of cash results in larger changes in firm value for firms with high ESG/CSR scores than those with low scores.

A complementary literature traces this value premium to lower risk. The general consensus is that CSR-oriented firms tend to be more resilient when facing different risks. For instance, Albuquerque et al. (2019) posit that, due to a product differentiation strategy, CSR-oriented firms face a relatively less price elastic demand, resulting in lower systematic risk. El Ghoul et al. (2011) and Hong and Kacperczyk (2009) both agree that responsible firms have lower risk because they have a wider investor base relative to irresponsible firms. Seltzer et al. (2022) document that firms with poor environmental performance, including a more significant carbon footprint, are associated with lower credit ratings and higher bond yield spreads. Ilhan et al. (2021) show that firms' equity downside risk, as reflected in option prices, increases in firms' carbon intensity.

Scholars also provide evidence that ESG/CSR-oriented firms are more resilient to market shocks. Lins et al. (2017) empirically address whether higher CSR activity makes companies more resilient to market shocks, showing that firm-specific social capital built up through CSR pays off during the 2008–2009 financial crisis: firms with high CSR ratings outperform low-CSR firms by at least four percentage points, suggesting that CSR acts as a shield in periods of market turmoil. Eisenkopf et al. (2023) provide evidence for the risk-mitigation and insurance-like effects of socially responsible investment, finding a positive and statistically significant effect of ESG scores during the downturn of the COVID-19 crisis in the European market. Similarly, Albuquerque et al. (2020) exploit the COVID-19 pandemic to test theories of environmental and social (ES) policies, showing that high-ES firms have significantly higher returns, lower return volatility, and higher operating profit margins than other firms. Finally, recent work in climate finance shows that green stocks tend to outperform brown stocks when investors' concern about climate change rises unexpectedly (Ardia et al., 2023; Pástor et al., 2022).

Taken together, this literature underscores that CSR-oriented firms are valued more highly, are more resilient to risk, and — most relevant for our setting — that green stocks tend to outperform brown ones during periods of market distress and, in particular, when climate concern rises among investors following real or perceived environmental and climate-related events. Building on this evidence, we argue that a green IPO acts as such an event: by raising the salience of environmental issues within an industry, it triggers a competitive shock to incumbents. We therefore expect green rivals to be more resilient to this shock and/or to outperform brown rivals. This leads to our third hypothesis:

Hypothesis 3: *The environmental performance of an industry rival positively moderates the negative market reaction to a green IPO.*

2.4 Green taste and portfolio reallocation

A growing body of work shows that investors are heterogeneous in their "taste" for green assets and that the dispersion of these preferences moves asset prices (Heinkel et al., 2001; Fama and French, 2007). In equilibrium, this taste — together with brown firms' greater exposure to tightening climate policy and rising public scrutiny — generates a carbon premium: brown stocks earn higher expected returns as compensation for these risks (Hong and Kacperczyk, 2009; El Ghoul et al., 2011; Chava, 2014; Bolton and Kacperczyk, 2021). Using a worldwide sample of over 14,400 firms across 77 countries, Bolton and Kacperczyk (2023) document such a premium in all sectors of Asia, Europe, and North America, and Zerbib (2019) and Baker et al. (2022) confirm it in the bond market. However, this premium is not static. The equilibrium model of Pástor et al. (2021) provides the theoretical foundation for our mechanism. While green assets carry lower expected returns in normal times — because investors derive utility from holding them and value their climate-risk hedge (Engle et al., 2020) — they deliver higher realized returns when investors' taste for green assets strengthens unexpectedly. The channel is portfolio reallocation: as green preferences intensify, investors tilt their holdings from brown to green assets, bidding up green prices. Pástor et al. (2022) and Ardia et al. (2023) validate this empirically, showing that the green-minus-brown (GMB) factor earns a positive return precisely when climate concern rises sharply and unexpectedly.

A complementary, micro-level literature documents the belief-updating that drives this reallocation. Although only a handful of papers focus directly on investors' attention to climate change, the evidence consistently shows that, as climate attention rises, investors update their valuations and shift their portfolios toward more environmentally friendly firms. Choi et al. (2020) find that when investors face abnormally warm temperatures — a first-hand experience that acts as a "wake-up call" — they buy low-emission stocks and sell high-emission ones, so that the former outperform the latter; notably, this response comes from retail rather than institutional investors. Aliano et al. (2023) likewise show that attention to climate change has a significantly positive effect on the returns of stocks scoring high on the environmental (E) and social (S) pillars of the Refinitiv ESG score. Together, these findings ground the reallocation channel in observable investor behavior.

Importantly, this reallocation can take place within an industry. As Zerbib (2022) points out, although some industries can fairly be identified as brown (e.g., coal, aircraft, petroleum, and natural gas), most include companies with very different environmental footprints: the utilities industry, for instance, contains both carbon-intensive firms (e.g., gas utilities) and low-emitting ones (e.g., renewable-energy utilities). Firms operating in the same industry are thus heterogeneous in their greenhouse-gas emissions, ranging from more-polluting (brown) to lower-polluting (green) than the industry average. Since investors differ in their taste for green assets (Pástor et al., 2021), those with a stronger-than-average taste for ESG — who derive non-pecuniary utility from holding green assets and disutility from holding brown ones — will tend to hold the largest share of the green rivals in their portfolios.

The attention shocks documented above, however, are largely treated as exogenous "weather". A green IPO, by contrast, is an endogenous, firm-driven event that can itself act as such a shock. As Bolton and Kacperczyk (2023) note, the taste for green assets is intrinsically dynamic — unexpected shifts in technology, policy, reputation, and investor awareness constantly lead sustainable investors to revise the preferences they price — and a green IPO could be one of these shifts at the industry level. When an entrant reveals itself as markedly greener than its incumbent peers, investors may read the event as a "green-taste shock" of the kind modeled by Pástor et al. (2021), triggering a repricing of the entire industry along the environmental dimension. As investors reassess incumbents against the new environmental benchmark set by the IPO, they reallocate capital toward greener firms: brown rivals, lagging furthest behind the benchmark, bear the most severe negative reaction, while green rivals are partly shielded or may even benefit. This is consistent with Cao et al. (2019), who find that the negative peer returns following a focal firm's positive CSR event are larger when the CSR gap between the firm and its peers is wider.

In short, if a green IPO operates through a shift in investor sentiment toward green assets — rather than through the competitive channel alone — then investor sentiment should mediate the cross-sectional reaction of rivals to the IPO signal.

this leads us to the following hypothesis:

Hypothesis 4: *Investor sentiment toward green assets mediates the negative market reaction of industry rivals to green IPOs.*

3 Data & Methodology

3.1 IPO Sample

The IPO sample used on our study comes from the Jay Ritter's dataset. We first collected all firms excluding non financial firms[4] that went public between 2007 and 2024 for which we could obtain both financial data from Refinitiv and IPO prospectus. After applying this filter we end up with 2655 completed IPOs. To be included in our final sample the IPO must satisfy the criterion that its market capitalization is above the top quartile of the market capitalization of all IPOs in the same industry.[5] This is because , in most industries, IPOs are not isolated in times. Thus, by selecting larger IPOs in each industry we minimize the cross-IPO contamination, i.e., that the effect of smaller IPO events on existing firms would be dominated by that of larger IPOs. A noisy measurement could then lead to mixed results as described by Akhigbe et al. (2003). Finally, our final sample consists of 545 completed IPOs.

3.2 Rival classification

Since the notio of "rivals" is central to our study, it is essential to clearly define what we mean by this term. We follow Li and Zhang (2021) and identify the product-market rivals of each IPO using the Text-based Network Industry Classification (TNIC) of Hoberg and Phillips (2016). Unlike fixed classification schemes such as SIC or NAICS, the TNIC is constructed from firm-specific pairwise similarities computed between the business descriptions contained in firms' 10-K filings and IPOs S-1 filings. For every pair of IPO-firm in a given year, a cosine similarity score is obtained from the vocabulary of their product descriptions. A firm is classified as an IPO "rival" when their similarity exceeds a calibrated threshold. As discussed by (Hoberg and Phillips, 2016), although it is convenient to use existing industry classifications such as SIC or NAICS, these measures have at least four limitations. First, neither reclassifies firms significantly over time as the product market evolves. Second, neither can easily accommodate innovations that create entirely new product markets. Third, SIC and NAICS impose transitivity even though two firms that are rivals to a third firm might not be rivals. Finally, industry classification do not provide continuous measures of similarity both within and across industries. The approach is particularly well suited to our setting for two reasons. First, competitive spillovers from an IPO operate through product-market proximity, which text-based similarity captures directly, whereas broad SIC groupings might pool together firms that do not actually compete. Second, because green entrants and their closest

[4] We exclude IPOs with two-digit SIC codes 60-69.

[5] Hsu et al. (2010) use a threshold of 10% . In our robustness test we repeat the the analysis by using a sample of IPOs with a market capitalization above the first quartile and the 10% respectively of the market capitalization of all IPOs in the same industry.

competitors frequently span conventional industry boundaries (e.g., an electric-vehicle firm competes with both automakers and battery producers), a text-based classification identifies economically relevant rivals that a SIC/NAICS classification would miss. For each IPO firm i, we define its set of rivals as the publicly listed firms that TNIC classifies as product-market peers of i in the year of the S-1 filing (or, when the newly listed firm has not yet entered the TNIC universe through its first 10-K, in the subsequent year). We restrict the rival set to firms that are already listed in the year preceding the IPO, so that their pre-event characteristics are observable and their returns are unaffected by the firm's own listing. To construct a counterfactual for the abnormal returns of rivals, we draw a matched sample of non-rival firms. Candidate controls are publicly listed firms whose TNIC similarity to the focal IPO lies below the classification threshold and that belong to a different one-digit SIC sector, ensuring they are neither product-market competitors nor close industry neighbours. For each rival we select one control through nearest-neighbour propensity-score matching.

Table 2 reports the distribution of the IPOs in our sample and the summary statistics of the main variables. Panel A describes the yearly distribution of the IPOs over 2007–2024, together with the mean of the main issuing-firm characteristics by listing year. IPO activity is markedly clustered in time: it contracts sharply during the 2008–2009 financial crisis (only 5 and 14 issues), recovers thereafter, and peaks in 2021 with 139 offerings—the SPAC- and growth-driven wave—before collapsing to just 3 in the 2022 downturn. The composition of issuers also shifts over the period: the share of venture-backed IPOs rises from around 10–15% in the early years to roughly 40–50% from 2019 onward, consistent with the growing weight of technology and high-growth firms in recent IPO cohorts.

Panel B reports the characteristics of the issuing firms. The typical IPO firm is sizeable but highly right-skewed: mean total assets are about \$5.6 billion against a median of \$0.9 billion, and mean sales are roughly \$1.0 billion (median \$0.3 billion). The median issuer raises capital at a market capitalization of about \$2.5 billion and is taken public by a highly reputable underwriter (median ranking of 9 on the Carter–Manaster scale). Issuing firms are relatively mature—median age at the IPO is roughly 16 years—and about 31% are VC backed before the IPO.

Panel C reports the characteristics of the rival firms used in our analysis, measured at the rival firm–year level (each rival firm–year is counted once, regardless of the number of IPO events to which it is matched). Rivals are, on average, established and sizeable listed firms: the median rival has a market capitalization of about \$0.7 billion and is 23 years old. Thus, when referring to median values, it's clear that IPO firms are younger than their industry rivals. This means that IPO firms have successfully competed with incumbent firms for a considerable amount of time before going public, and thus they are not new competitors after the IPO, but rather existing competitors with new characteristics (Hsu et al., 2010). We also notice that, assets and market capitalization are larger for the IPOs than for the rival firms.

Their financial profile is heterogeneous—median return-on-assets is positive (about 2.8%) but the mean is negative, and book-to-market, leverage, and idiosyncratic volatility all display the right-skewness typical of large cross-sections of listed firms. Overall, the statistics indicate that incumbents reacting to IPOs are mature, profitable-on-average firms, providing a relevant benchmark for assessing the intra-industry spillover effects we study below. The definitions of the variables used in the paper can be found in Table 1.

[Insert Table 1 here.]

[Insert Table 2 here.]

3.3 Dependent variable

In order to measure the reaction of rivals when an IPO occurs within their industry, we follow Li and Zhang (2021) and Hsu et al. (2010) and estimate the Cumulative Abnormal Returns (CARs) in different event windows.

Notably, we first compute the Abnormal Returns (ARs) for rival firm i on day t around IPO event j as it follows:

$$AR_{i,t} = R_{i,t} - (\alpha + \beta R_{m,t}) \tag{1}$$

Where $R_{i,t}$ is the daily return of rival firm i, and $R_{m,t}$ represents the observed return on the S&P 500 Index (our proxy for the market return) on day t. The parameters α and β are estimated using a market model from 255 to 42 trading days prior to the event day, as in (Hsu et al., 2010).

Finally, we compute the Cumulative Abnormal Returns (CARs) for rival i in response to IPO event j over a given event window as follows:

$$CAR_i = \sum_{t=1}^{T} AR_{i,t} \tag{2}$$

Where T represents the length of the event window. Following Hsu et al. (2010), we compute the CARs during event windows $(-10, 1)$, $(-10, 5)$, $(-10, 7)$, $(-10, 10)$, $(-10, 15)$, $(-10, 20)$, $(-5, 1)$, and $(-5, 5)$.

3.4 Main variables

3.4.1 Measuring Climate Commitment

In the past, textual analysis related to ESG and climate was often conducted using predefined dictionaries of relevant words and then simply counted the frequency of these words as a proxy of the commitment to sustainability of a company (Baier et al., 2020; Mansouri and Momtaz, 2022; Sautner et al., 2023). However, these methods do not account for context. The lack of context is a significant drawback, given the ambiguity of many climate-related words.

We construct our measure of the climate commitment of a firm by using the ClimateBERT langauge model (Webersinke et al., 2021) , which is an adaptation of the Bidirectional Encoder Representations from Transformers (BERT) model, and is being increasingly adopted in the field of climate finance (Bingler et al., 2024; Leippold and Yu, 2026). ClimateBERT is particularly suited for our tasks because it is pre-trained on a diverse corpus of general and climate-specific texts, allowing it to understand the language of climate-related content more effectively than traditional keyword-based methods. One advantage of ClimateBERT is its flexibility for fine-tuning on specific downstream tasks using labeled data. For example, once trained to recognize climate-related sentences, the model can learn to classify new sentences with similar structures and contexts.

There are several compelling reasons for adopting a text-based approach rather than relying on traditional ESG agency ratings. First, traditional agency rating (such as Refinitiv or MSCI) suffer from a poor coverage of CSR scores for IPO firms, as agency rating are typically not able to disclose scores for private firms and for small-and-medium-sized companies (SMEs). This eventually leads to a a bias selection problem as the majority of IPOs do not have a commercial rating [6]. As pointed out by Reber et al. (2022), ESG rating information in IPO is a relative new phenomenon and richer datasets will be available as more IPOs will disclose ESG ratings as part of their prospectus in the future. Secondly, previous literature documents a low correlation between ESG scores from different rating agencies Berg et al. (2022). This disagreement between commercial ratings raises the question of which one is the most suitable for the sustainability assessment of an IPO. Lastly, commercial ratings are usually released ex-post due to information delays and retroactive data updates by rating providers. For instance, Refinitiv disclosures ESG scores only at the end of the year. This may generate a "look-ahead bias" (Berg et al., 2021) as the metric incorporates corporate dynamics occurring after the IPO event.

For IPOs, we rely on the IPO S-1 filing, which is the main official document for any IPO, providing investors with first impressions of a company's financial and busi-

[6] Reber et al. (2022) report the same problem of bias selection. Notably, from a starting sample of 1312 IPOs that went public between 2002 and 2018 in USA, only 87 disclosed their Refinitv ESG score at the time of the IPO. Similarly, we find that only 200 out of 3000 IPOs that went public in US between 2002 and 2024 disclosed their Refinitv ESG scores.

ness strategies before it goes public (Hanley and Hoberg, 2010). Therefore, we use a web crawling algorithm to download the IPO prospectus (S-1 filing) for all the IPOs of our sample from the SEC Edgar database. Similarly, for rivals and control group, we downlaod the 10-k filings, which are the annual reports where stakeholders expect to find financially relevant corporate disclosures and where companies are legally required to publish climate-related information in the near future.

Since our purpose is to estimate the level of climate commitment by IPOs and firms included in our dataset, we apply the trained sentiment model based on ClimateBERT (Bingler et al., 2024) to all the climate-related paragraphs in each IPO S-1 filing and each firm's 10k document,

Finally, we measure the grenness of an IPO as it follows:

$$\text{Green IPO}_i = \begin{cases} 1 & \text{if } \left(\frac{N_i^{\text{opp}} - N_i^{\text{risk}}}{N_i^{\text{clim}}}\right)_{\text{industry adjusted}} > 0 \\ 0 & \text{otherwise} \end{cases} \tag{3}$$

Where Green IPO_i is a dummy variable equal to 1 if the industry-adjusted climate sentiment score for firm i is strictly positive, and 0 otherwise. N_i^{opp} represents the number of paragraphs detecting climate-related opportunities, while N_i^{risk} denotes the number of paragraphs identifying climate-related risks. The denominator, N_i^{clim}, indicates the total number of climate-related paragraphs, serving as a scaling factor to normalize the net sentiment measure. The subscript industry adjusted signifies that the raw score is demeaned relative to firm i's industry average to control for sector-specific climate exposure.

Thus, our measure of the climate-commitment of an IPO is relative to the the industry benchmark in a given year. A positive score means that an IPO is "greener" than the industry in which operates.

The following are three examples of climate-opportunity statements that received a positive sentiment classification from the LLM, drawn from the IPO prospectuses of three well-known issuers in our sample of IPO events.

> We are the first and currently only company to commercially produce a federally-compliant highway-capable electric vehicle, the Tesla Roadster, which combines a market-leading range on a single charge with attractive design, driving performance and zero tailpipe emissions.*[Tesla Motors Inc, IPO prospectus, June 2010]*

> We build meat directly from plants, an innovation that enables consumers to experience the taste, texture and other sensory attributes of popular animal-based meat products while enjoying the nutritional benefits of eating our plant-based meat products. ... The success of our breakthrough innovation

> model and products has allowed us to appeal to a broad range of consumers, including those who typically eat animal-based meats, positioning us to compete directly in the $1.4 trillion global meat industry.*[Beyond Meat Inc, IPO prospectus, May 2019]*
>
> We develop, own, and operate renewable natural gas ("RNG") projects, using proven technologies that supply RNG into the transportation industry and use RNG to produce electrical power for the electrical grid ("Renewable Electricity").*[Montauk Renewables Inc, IPO prospectus, January 2021]*

Figure 1 reports the average climate-opportunity score (Clim_Opp) of IPO prospectuses across two-digit SIC industries over the 2007–2024 period. Two patterns stand out. First, the scores display substantial cross-industry heterogeneity, ranging from 82.2 for Electric, Gas & Sanitary Services to below 1 for Apparel Stores, confirming that climate-related language in IPO prospectuses is far from uniform and strongly conditioned by sector. Second, and perhaps counterintuitively, the industries that score highest are precisely the most carbon-intensive ones — Electric, Gas & Sanitary Services (82.2), Oil & Gas Extraction (47.9), Transportation Equipment (41.4) and Pipelines (31.9). This pattern is consistent with the notion that firms most exposed to the low-carbon transition are also those that devote the greatest attention to framing climate change as a source of business opportunity, whether to signal their commitment to investors or to manage transition-risk perceptions. By contrast, sectors with limited direct climate exposure, such as Apparel Stores, Health Services and Business Services, exhibit minimal climate-opportunity content.

Table 3 illustrates the cross-sectional variation in the climate-opportunity content of IPO prospectuses after netting out industry effects. Because the raw score mechanically increases with industries whose business is inherently climate-related, we adjust it by subtracting the mean score of all IPOs in the firm's two-digit SIC code, isolating the within-industry component of a firm's climate-opportunity disclosure. Panel A reports the ten issuers with the highest adjusted score and Panel B the ten lowest. The ranking is intuitive and lends face validity to the measure. The most "green" issuers are pure-play clean-technology firms: renewable natural gas (Montauk Renewables), lithium for EV batteries (Livent), solar equipment (FTC Solar, TPI Composites), and advanced biofuels and bio-based chemicals (Methes Energies, Renewable Energy Group, Solazyme, BioAmber). What makes these cases particularly informative is that several of them belong to the Chemicals industry (SIC 28), which—as shown in Figure 1—is not among the sectors with the most climate-related disclosure, but rather one of those where firms devote, on average, the least space to climate opportunities. Their high adjusted scores therefore reflect a genuinely distinctive, firm-specific climate narrative that sets them sharply apart from industry peers who remain largely silent on the topic, rather than an industry-wide tailwind. Conversely, the most "brown" issuers in Panel B are concentrated in carbon-intensive sectors that do score highly on average—Electric and Gas Utilities (SIC 49), Coal Mining (SIC 12), and oil-and-gas midstream partnerships (PAA Natural Gas Storage, Targa Resources, Tesoro Logistics, Western Gas)—yet devote essentially none of their prospectus to climate opportunities (raw scores at or near zero), scoring well below their own industry peers.

While Figure 1 shows that climate-opportunity disclosure is concentrated in the industries most directly exposed to the low-carbon transition—electric and gas utilities, oil and gas, transportation equipment, and renewable-energy-related manufacturing—Table 4 makes clear that this between-industry pattern masks substantial within-industry heterogeneity. For each two-digit SIC code, the table contrasts the "greenest" and the "brownest" issuer, defined as the firms with the highest and lowest industry-adjusted score, and reports the resulting spread. The dispersion is largest precisely in the transition-relevant sectors. In Electric and Gas Utilities (SIC 49) the spread reaches 10.80, separating Montauk Renewables, a renewable-natural-gas pure play, from PAA Natural Gas Storage; comparable gaps emerge in Electronic Equipment (SIC 36, FTC Solar vs. Airvana), Transportation Equipment (SIC 37, Phoenix Motor vs. a blank-check acquisition vehicle), Industrial Machinery (SIC 35, TPI Composites vs. Netezza), and Chemicals (SIC 28, Livent vs. ARYx Therapeutics).

Taken together, these patterns indicate that belonging to a "green" industry is neither necessary nor sufficient for a firm to position itself around climate opportunities. Although the firms with the most climate-opportunity disclosure are indeed found in the sectors most involved in the transition, membership in such a sector does not pin down a firm's disclosure: within the same industry, issuers differ markedly in the extent to which they articulate a climate narrative. This firm-level heterogeneity—rather than coarse industry classifications—is what our adjusted measure is designed to capture and what we exploit in the analysis that follows.

[Insert Figure 1 here.]

[Insert Table 3 here.]

[Insert Table 4 here.]

3.4.2 Green and Brown rivals

Our analyses require the identification of green and brown rivals. To do so, we follow Ardia et al. (2023) and define green (brown) rival firms as "firms that create economic value while minimizing (not minimizing) damages that contribute to climate change". We use the GHG emissions disclosed by firms to quantify these damages. These variables are retrieved from the Asset4/Refinitiv database [7]. The GHG Protocol Accounting and Reporting Standard classifiers a company's GHG emissions into three scopes. Scope 1 emissions are direct emissions from owned or controlled sources. Scope 2 emissions are indirect emissions from the generation of purchased energy. Scope 3 emissions are all indirect emissions (not included in Scope 2) that occur in a firm's value chain. These are reported in tonnes of carbon dioxide (CO2) equivalents. Since including Scope 3 reduces the data coverage, we measure GHG emissions as the sum of Scope 1 and 2, as in Bua et al. (2024). Firms are classified as green if their measure of GHG emissions intensity (i.e., Scope 1 & Scope 2 scaled by revenues) is below the 25th percentile of their industry distribution, and brown if above the 75th percentile or if they do not disclose their GHG emissions. As pointed out by Matsumura et al. (2014), firms making truthful voluntary carbon emission disclosures deliver transparent non-financial information to investors that informs them of future costs that may be imposed upon the firm due to its carbon emissions. If firms do not disclose carbon emissions, then investors will not only impute the firms' carbon emissions, but also likely treat non-disclosure as an adverse signal and penalize non-disclosing firms [8]

Table 5 documents substantial heterogeneity in emissions across two-digit SIC industries. Carbon intensity is highest in transition-exposed sectors—Water Transport, Oil and Gas Extraction, Hotels and Lodging, and Chemicals—and lowest in services and trade, such as Business Services , Health Services , and Wholesale. The decomposition into Scope1 and Scope2 is also informative: emissions are overwhelmingly direct (Scope1) in industries that burn fuel on site, such as Water Transport (Scope2 close to zero) and Oil and Gas, whereas they are dominated by purchased energy (Scope2) in Hotels, Communications, and General Merchandise.

[7] In additional analyses, we replace the GHG emissions with the "Environmental pillar score" from the Asset4/Refinitv database. The environmental dimension of the ESG scoring is a valid alternative to classify firms between green and brown. For instance, Pástor et al. (2022) use the environmental score from the MSCI ESG Ratings data to study the returns of green and brown stocks. An advantage in using the Environmental pillar based on the Asset4/Refinitv ESG scoring is that data are already industry adjusted so that a heavily polluting firm is classified as green if it pollutes less than other firms in its heavily polluting industry. As we did with the GHG emissions intensity, we classify firms as green if their E score is above the 75th percentile of the distribution and brown if below the 25th percentile or if they do not have a score.

[8] In their work, Matsumura et al. (2014) find that the median value of firms that disclose their carbon emissions is about $2.3 billion higher than that of comparable non-disclosing firms.

3.5 Control variables

Following Li and Zhang (2021) we use a set of control variables including the market capitalization (Size), the Book-to-market ratio (BM), the return on assets ratio (ROA), the idiosyncratic volatility (IV), and the Debt-to-Equity ratio (Leverage). The descriptive statistics for rivals are reported in Panel B in Table I.

3.6 The empirical model

The model of the baseline OLS regression takes the following form:

$$\begin{aligned} CAR_{i,j} = \alpha + \beta_1 \text{Rival}_{i,j} + \beta_2 \text{Green\_IPO}_j + \beta_3 \text{Rival}_{i,j} \times \text{Green\_IPO}_j \\ + \gamma \, \text{Controls}_{i,j} + \text{IPO}_j + \epsilon_{i,j} \end{aligned} \tag{4}$$

Where $CAR_{i,j}$ represents the cumulative abnormal returns computed during windows (-10, 1), (-10, 5), (-10,7), (-10,10), (-10,15), (-10,20), (-5, 1), and (-5, 5) of firm i around IPO j within the same industry; $Rival_{ij}$ is a dummy variable which is equal to one for firms within the same industry of the issuing firm j and 0 for firms from other industries; Green_IPO is a dummy equal to one for green IPOs and 0 for brown IPOs ;$Controls_{ij}$ is a set of control variables including market capitalization (Size), Book-to-Market value (BM), the return on assets ratio (ROA), the idiosyncratic volatility (IV), and the Debt-to-Equity ratio (Leverage). To account for heterogeneity across IPO events we clustered standard errors by IPO events. Since we cannot control for confounding factors that could influence rivals' CARs, we follow Li and Zhang (2021) and use a propensity score matching (PSM) to identify matches between rivals and non-rivals firms. In particular, we first estimate a logit model among all firms for an IPO event , where the dependent variable equals one for rivals and 0 for non-rivals.

4 Results

4.1 Price reaction to IPOs

We first test the intra-industry spillover effect of IPOs by plotting in Figure 2 the mean CAR both for the rival and control firms around the the completion of IPOs in their industry. We notice that the two curves start to diverge around 10 days prior to the IPO date. The returns of the rival firms exhibit a significantly negative reaction that also continues for a considerable period of time after the IPO event. In Table 6 we run the OLS regression as presented in equation (4). Since we cannot control for confounding factors that could influence rivals' CARs, we follow Li and Zhang (2021) and use a propensity score matching (PSM) to identify matches between rivals and non-rivals firms.

In particular, we first estimate a logit model among all firms for an IPO event , where the dependent variable equals one for rivals and 0 for non-rivals, while the independent variables are the control variables presented in section 3.4. Then, we employ the propensity scores (i.e., the predicted probability from these probit regressions) to perform the nearest-neighbor propensity score matching. As in Li and Zhang (2021), for each IPO event, every rival firm is matched to a firm in other industries with the closest propensity (i.e.,control firms). For those in other industries that are matched to at least two rival firms, we only retain the pair for which the distance between firms' propensity scores is the smallest. To ensure that matched control firms are not subject to the same competitive dynamics as rival firms, we impose an explicit industry-distance restriction on the PSM donor pool. Specifically, we restrict the pool of potential control firms to those whose on-digit SIC code differs from that of the rival firm to which they are matched, ensuring that treated (i.e. rivals) and and control firms (i.e. non-rivals) belong to entirely different sectors of the economy[9].

As expected, all the coefficients of *Rival* are all significantly negative after controlling for other factors, with the only exception of the shortest window (-5,1), (-5,5) and (-10,1). We also notice that both the t-statistic of *Rival* and its economic significance increase with the expansion of the event window, suggesting that the negative CAR following an IPO event is stronger in the long period. This suggests that the negative price reaction is not restricted to the surrounding days of the IPO date but it is prominent also in the weeks before and after the IPO event. Taking together, the results support our *HP1* that IPO rivals experience a negative market reaction to completed IPOs in their industry.

[Insert Figure 2 here.]

[Insert Table 6 here.]

4.2 IPO greenness

In order to test our *HP2* we first plot the market reaction of rivals only conditional on whether the IPO event is labeled as green or brown. To do so, we first adjust by industry our *Green IPO* score and then classify an IPO as green if the adjusted score is positive

[9] If matched control firms were drawn from the same one-digit SIC sector as the rival — but from a different two-digit industry — they would nonetheless share common sector-level shocks, correlated investor sentiment, and potential spillovers along the supply chain. For instance, a rival firm in Electronic Equipment (SIC 36) paired with a control in Industrial Machinery (SIC 35) would place both firms within Manufacturing (SIC1 = 3), exposing the control to the same broad sectoral dynamics triggered by the IPO event. As a result, the control firm's abnormal returns would partially reflect the very treatment effect we seek to identify, biasing the estimated competitive impact toward zero.

and brown if negative. Finally, in Figure 3 we plot the mean CAR conditional on green IPOs (green line) and the mean CAR conditional on brown IPOs (brown line). We notice that the green curve lies persistently below the brown curve throughout the entire event window, indicating that the average market reaction of rival firms is substantially more negative when a green IPO occurs than when a brown IPO enters the same industry.

Since we can't draw any solid conclusion by just observing the plot of the two curves, in Table 7 we run a OLS regression to test whether *Green IPO* is statistically significant. We find that the interaction term *Rival X Green IPO* is negative and statistically significant across all event windows. These results confirm that the competitive contagion effect of IPOs on industry rivals is significantly amplified when the listing firm demonstrates strong climate commitment. In terms of economic significance, the coefficient on *Rival X Green IPO* of -1.078 in model (1) implies that rival firms experience an additional abnormal return of approximately -108 bps when the IPO event is green — that is, when the issuing firm's industry-adjusted climate commitment score, derived from its S-1 prospectus, exceeds the industry median — relative to rival firms around non-green IPO events and compared to their respective control firms. Across all eight event windows, this incremental penalty ranges from -55 bps CAR (-5,+1) to -140 bps CAR (-10,+15), suggesting that the market's reassessment of incumbent competitors is meaningfully more severe when the entering firm credibly signals superior environmental positioning.

[Insert Figure 3 here.]

[Insert Table 7 here.]

4.3 Disentangling green and brown rivals

For testing our *HP3*, which predicts that the environmental performance of an industry rival positively moderates the negative market reaction to a green IPO, we use the following equation:

$$\begin{aligned} CAR_{i,j} = \alpha + \beta_1 \text{Rival}_{i,j} + \beta_2 \text{Green\_IPO}_j + \beta_3 \text{Brown\_Rival}_{i,j} \times \text{Green\_IPO}_j \\ + \gamma \, \text{Controls}_{i,j} + \text{IPO}_j + \epsilon_{i,j} \end{aligned} \tag{5}$$

Where $Brown\_Rival_{i,j}$ is a dummy variable equal to 1 if the rival firm's GHG emission intensity (Scope 1 & 2) exceeds the 75th percentile of the industry distribution, or if the firm does not disclose its carbon emissions. To the extent that green stocks tend to outperform brown stocks in periods of market shocks (Lins et al., 2017) and when investors revisit their beliefs on climate change in days of great climate concerns (Pástor et al., 2022; Ardia et al., 2023), we expect a negative and significant coefficient on the interaction term *Brown_ Rival X Green_ IPO*. In Table 8 we present the results of our analysis. We observe a negative and statistically significant coefficient for *Brown_ Rival X Green_ IPO*. In terms of economic significance, since both *Green_ IPO* and *Brow_ Rival* are dummy variables, the interaction coefficient admits a clean discrete interpretation. The coefficient on *Brown_ Rival X Green_ IPO* of -1.314 in model (1) implies that high-emission rival firms — those with GHG intensity above the 75th percentile of the industry distribution, or that do not disclose their carbon emissions — suffer an additional abnormal return of approximately -131 bps around green IPO events relative to what they would experience around a non-green IPO event, over and above the baseline penalty already captured by the *Brow_ Rival* dummy alone (-50 bps). Summing the two coefficients, the total cumulative abnormal return penalty for a brown rival around a green IPO reaches approximately -182 bps over the CAR(-10,+5) window, climbing to -325 bps over the longer CAR(-10,+20) window. Across all eight event windows, the incremental penalty attributable to the interaction ranges from -68 bps CAR(-5,+1) to -173 bps CAR(-10,+20), consistent with the hypothesis that markets impose a significantly harsher reassessment on environmentally laggard incumbents when confronted with a credibly green new entrant — a result that holds at conventional significance levels across all windows.

[Insert Table 8 here.]

4.4 Investor attention

To test our *HP4*, which predicts that investor attention toward green assets mediates the differential market reaction of rivals to green IPOs, we follow Barber and Odean (2008) and use abnormal trading volume (CAV) as a proxy for investor attention. We rely on this measure for three reasons. First, abnormal trading volume is one of the most reliable and widely used observable signals that a stock has caught investors' attention, since heightened attention mechanically translates into trading activity well beyond a stock's normal turnover (Barber and Odean, 2008). Second, unlike survey- or media-based proxies, it is model-free, available at the daily frequency required by our event-study design, and observable for the full cross-section of rival firms. Third, and most importantly for our identification, trading volume is informative about the *mechanism* in a way that returns alone are not: a negative CAR is equally consistent with a pure competitive shock and with a sentiment-driven reallocation, whereas a reallocation of investor attention across green and brown rivals should leave a distinct, independent footprint in abnormal volume.

We test the mechanism in two stages. In the first stage, we examine whether a green IPO reallocates investor attention across rivals according to their environmental profile, by estimating:

$$\begin{aligned}\text{CAV}_{i,j} = \alpha + \beta_1 \text{Green\_IPO}_j + \beta_2 \text{Brown\_Rival}_{i,j} + \beta_3 \text{Brown\_Rival}_{i,j} \times \text{Green\_IPO}_j \\ + \gamma\, \text{Controls}_{i,j} + \text{IPO}_j + \epsilon_{i,j}\end{aligned} \tag{6}$$

where $\text{CAV}_{i,j}$ is the cumulative abnormal trading volume of rival i around IPO j over the same event windows used throughout the paper. In the second stage, we test whether the attention captured by abnormal volume is in turn priced into rivals' returns, by estimating:

$$\text{CAR}_{i,j} = \alpha + \delta\, \text{CAV}_{i,j} + \gamma\, \text{Controls}_{i,j} + \text{IPO}_j + \epsilon_{i,j} \tag{7}$$

Table 9 reports the results. Panel A shows that green IPOs trigger a large and highly significant increase in the abnormal trading volume of industry rivals: the coefficient on *Green IPO* is positive and significant at the 1% level across all eight event windows, indicating that the entry of a credibly green firm sharply raises the salience of incumbents in the eyes of investors. Crucially, this attention is not distributed uniformly. The interaction *Green IPO* × *Brown_ Rival* is negative and statistically significant in the windows surrounding the listing event (e.g., -2.612 over the $(-10, +1)$ window and -1.969 over the $(-5, +1)$ window, both significant at the 10% level), implying that high-emission rivals capture a significantly smaller share of the volume spike than their low-emission peers. Investors therefore concentrate their attention disproportionately on green incumbents when a green IPO enters the industry, consistent with a within-industry tilt toward environmentally superior firms.

Panel B closes the loop by relating abnormal volume to rivals' cumulative abnormal returns. The coefficient on *CAV* is positive and significant precisely in the short event windows in which attention spikes — 0.017 over $(-10, +1)$, 0.009 over $(-10, +5)$, 0.021 over $(-5, +1)$ and 0.008 over $(-5, +5)$, all significant at the 1% level — while it dies out over the longer horizons. In other words, the rivals that attract abnormal trading activity around the listing experience significantly less negative returns, and this attention premium is, as expected, a transitory event-window phenomenon rather than a permanent repricing (Barber and Odean, 2008). Read jointly, the two panels support our *HP4*: a green IPO operates as a "green-taste shock" (Pástor et al., 2021) that reallocates investor attention toward green rivals (Panel A), and this attention-driven buying pressure cushions their price reaction (Panel B). The resilience of green rivals documented in Table 8 thus does not arise solely from the competitive channel, but is transmitted, at least in part, through an investor-attention and portfolio-reallocation channel.

[Insert Table 9 here.]

5 Conclusions

This paper investigates whether the environmental profile of an issuing firm shapes the intra-industry spillover effects of its initial public offering. Building on a sample of 545 completed U.S. IPOs over the 2007-2024 period and a propensity-score-matched set of rival firms, we combine a ClimateBERT-based textual measure of the climate commitment disclosed in the IPO prospectus with rivals carbon emissions from Asset4/Refinitiv, and we trace the cross-sectional market reaction of industry incumbents around the listing event.

Our results can be summarized in four findings. First, consistent with the established IPO spillover literature (Hsu et al., 2010), industry rivals experience a significant negative cumulative abnormal return around an IPO in their industry. Second, this negative reaction is significantly amplified when the issuing firm exhibits a stronger climate commitment in its prospectus: the interaction between *Rival* and *Green IPO* is negative and significant across all event windows, implying an additional abnormal return of roughly -108 basis points around green listings, consistent with the view that a credibly green entrant raises the environmental benchmark that incumbents are expected to match (Flammer, 2013; Cao et al., 2019).

Third, and central to our contribution, this competitive shock is highly heterogeneous across rivals. Green incumbents are significantly more resilient than brown ones: high-emission rivals suffer an incremental penalty of approximately -131 basis points around green IPOs, so that the total cumulative abnormal return for a brown rival reaches about -182 basis points over the $(-10, +5)$ window and climbs to roughly -325 basis points over the $(-10, +20)$ window. The market thus imposes a substantially harsher reassessment on environmentally laggard incumbents when confronted with a credibly green new entrant. Fourth, we shed light on the mechanism underlying this differential response by exploiting abnormal trading volume as a proxy for investor attention (Barber and Odean, 2008). We find that green IPOs generate a large and highly significant spike in the abnormal trading volume of industry rivals, and that this attention is directed disproportionately toward green incumbents, while brown rivals receive a significantly smaller share of the volume increase. In turn, abnormal trading volume is positively and significantly associated with rivals' cumulative abnormal returns in the short event windows. Taken together, these results indicate that the resilience of green rivals operates through an investor-attention and portfolio-reallocation channel: a green IPO acts as a "green-taste shock"

(Pástor et al., 2021) that prompts investors to actively rebalance their holdings within the industry, divesting from brown incumbents in favor of environmentally superior ones, thereby partially offsetting the competitive shock faced by green rivals.

Our findings carry relevant implications for policymakers, firms, and investors. For policymakers, the evidence that a green IPO generates measurable negative externalities for high-emission incumbents indicates that environmental transparency at the moment of listing produces broader market-discipline effects that incentivize the entire industry to internalize climate-related competitive risks. Against the backdrop of the recent regulatory retreat on climate disclosure (SEC, May 2026), our results suggest that the information conveyed by environmental disclosure is value-relevant and is priced by investors almost immediately, well beyond the issuing firm itself; scaling back mandatory climate-related disclosure would therefore deprive market participants of information they demonstrably use and weaken the channel through which environmental standards diffuse across an industry. We thus argue that there is a sound, market-based rationale for sustaining, rather than reversing, disclosure requirements. For firms and managers, our findings imply that the arrival of a highly climate-committed IPO effectively resets the environmental benchmark against which all incumbents are evaluated by investors, so that a proactive environmental posture is not merely a matter of regulatory compliance or reputational management but a genuine source of competitive resilience: firms that are already green at the time of a disruptive green entry are significantly shielded from the value destruction experienced by their brown peers. Finally, for investors, the environmental classification of incumbent firms emerges as a value-relevant dimension around IPO events, suggesting that portfolio strategies overweighting green incumbents in industries with high IPO activity, particularly when such IPOs exhibit strong climate commitment, may deliver superior risk-adjusted returns during the listing window.

Our study is not without limitations, which in turn suggest avenues for future research. Our evidence is drawn from the U.S. market; extending the analysis to other institutional environments would help assess the external validity of the green spillover effect. Moreover, while abnormal trading volume provides observable support for the investor-attention channel, future work could exploit granular ownership or order-flow data to disentangle the relative contributions of retail and institutional investors to the within-industry reallocation we document.

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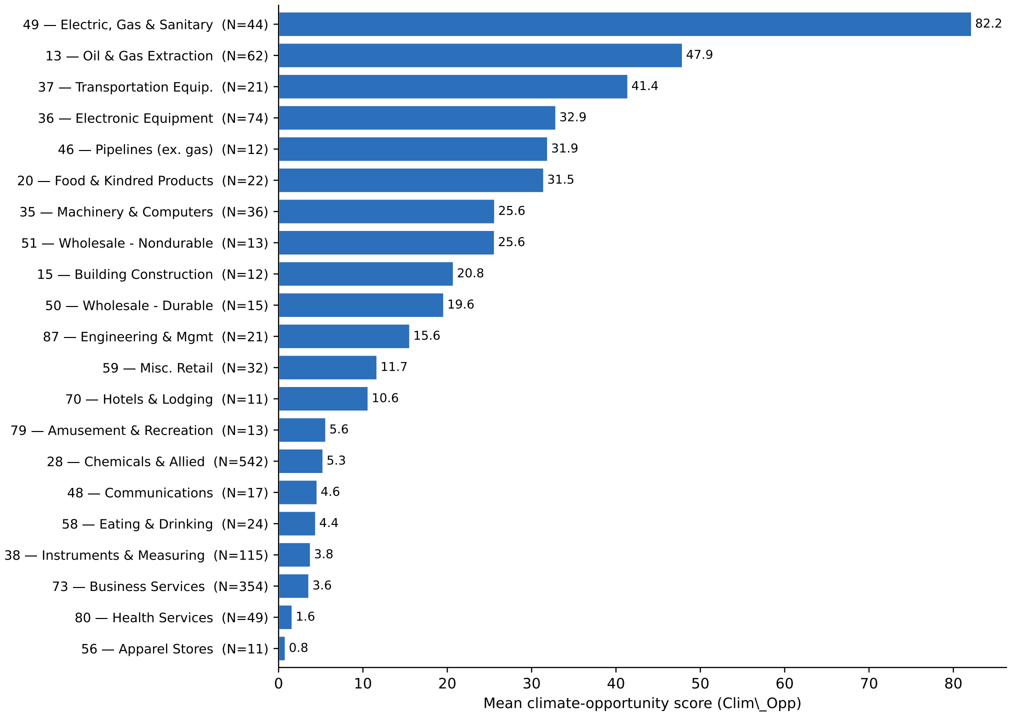

Figure 1: Climate-opportunity score by industry, 2007–2024. The figure plots the mean climate-opportunity score (*Clim_ Opp*) of U.S. IPO firms over 2007-2024 from the Jay Ritter dataset, grouped by 2-digit SIC industry (industries with more than 10 IPOs). The score is the LLM-based count of climate-opportunity statements in each firm's IPO prospectus. Bars are sorted by industry mean; the number of IPOs in each industry (N) is reported next to each bar.

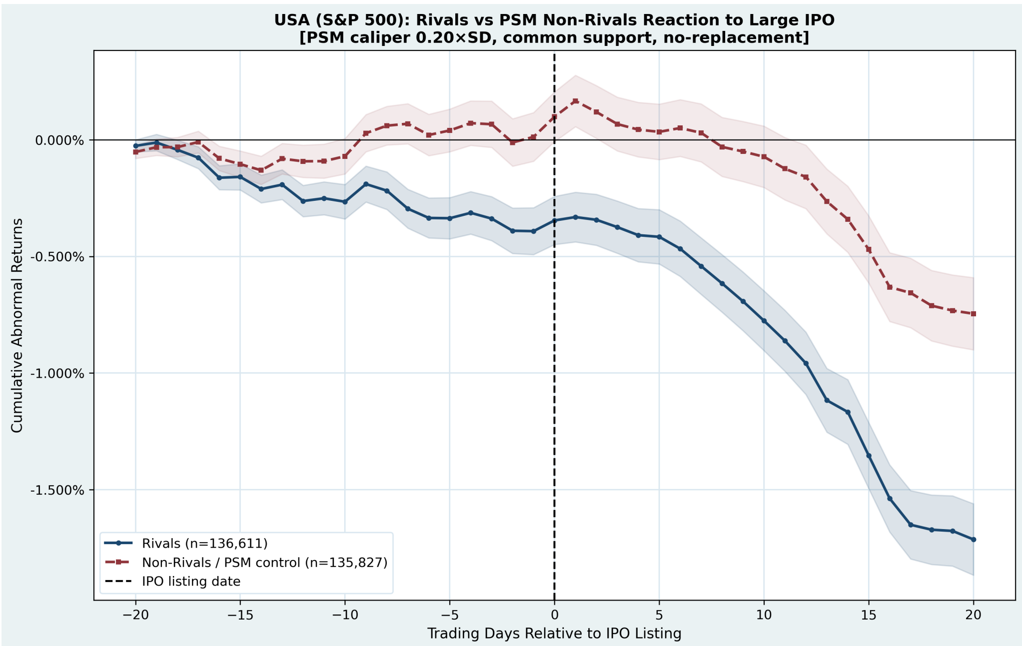

Figure 2: Cumulative Abnormal Returns of industry rivals around IPO events. The figure plots the mean CAR of industry rivals VS control firms over a $[-20, +20]$ day window relative to the IPO date. The vertical dashed line marks the IPO date (day 0).

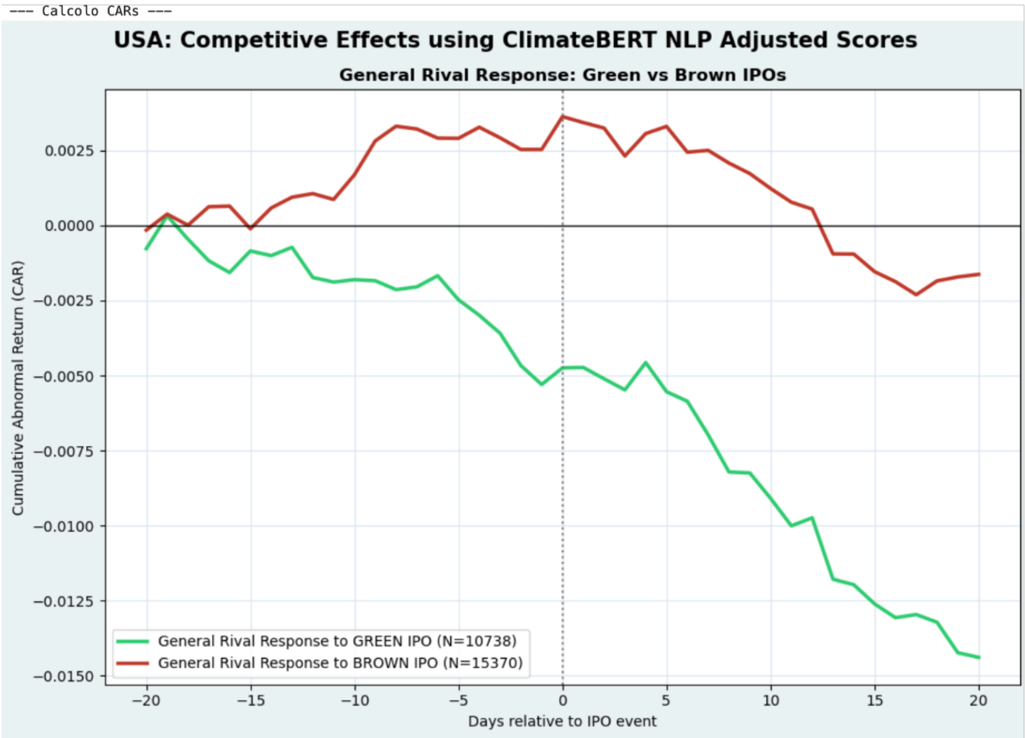

Figure 3: Cumulative Abnormal Returns of industry rivals around green and brown IPO events. The figure plots the mean CAR of industry rivals over a $[-20, +20]$ day window relative to the IPO date, separately for rivals of green IPOs (green line, N = 10,738) and rivals of brown IPOs (red line, N = 15,370). Returns are adjusted using ClimateBERT NLP scores. The vertical dashed line marks the IPO date (day 0).

Table 1: Variable Definitions

Variable	Definition	Source
Panel A: Dependent variables		
CAR	Cumulative abnormal returns of a rival firm around an IPO in its industry, from a market model estimated over the $(-255, -42)$ pre-event window, cumulated over the windows $(-10, -1)$, $(-10, -5)$, $(-10, -7)$, $(-10, -10)$, $(-10, -15)$, $(-10, -20)$, $(-5, -1)$ and $(-5, -5)$ (%).	Refinitiv
CAV	Cumulative abnormal trading volume of a rival firm (Barber and Odean, 2008): difference between average trading volume over the event window and over the estimation window.	Refinitiv
Panel B: Main independent variables		
Rival	Dummy equal to one for rivals of an issuing firm (same two-digit SIC code) and zero for the matched control firms.	Factset
Green IPO	Dummy equal to one if the industry-adjusted Climate-BERT climate-commitment score of the issuing firm's S-1 prospectus is strictly positive, and zero otherwise.	Own calc.
Brown rival	Dummy equal to one if the rival's GHG emission intensity exceeds the 75th industry percentile, or if the firm does not disclose its emissions.	Asset4/Refinitiv
Panel C: Firm-level control variables		
Size	Natural logarithm of the market capitalisation of a firm in a year.	Refinitiv
Age	Natural logarithm of the years from the founding date to a given date in a year.	Factset
BM	Book-to-market ratio of a firm in a year.	Refinitiv
Idio. Vol.	Standard deviation of the residuals from regressions of excess stock returns on excess market returns over a year.	Refinitiv
ROA	Return-on-assets ratio of a firm in a year (%).	Refinitiv
Leverage	Debt-to-equity ratio of a firm in a year (%).	Refinitiv
Panel D: Issuing-firm (IPO) characteristics		
Total assets	Book value of the total assets of the issuing firm in the IPO fiscal year ($MM).	Prospectus
Sales	Net sales (revenues) of the issuing firm in the IPO fiscal year ($MM).	Prospectus
Underwriter ranking	Carter–Manaster reputation rank of the lead underwriter, 0–9 scale.	Jay Ritter
VC backing	Dummy equal to one if the issuing firm is VC-backed before the IPO, and zero otherwise.	Jay Ritter

Note: This table defines the variables used in the empirical analysis. Panel A reports the dependent variables, Panel B the main independent variables, and Panel C the firm-level control variables. CARs are cumulated over symmetric and asymmetric windows around the IPO event day 0. All control variables are measured at the firm–year level.

Table 2: USA – IPO Distribution and Descriptive Statistics of Main Variables

Panel A: IPO distribution (mean of main variables by listing year)							
Year	Number	Assets ($MM)	Sales ($MM)	Mkt cap. ($MM)	UW rank	Age (yrs)	VC% (%)
2007	33	22,100	1,977	1,906	8.10	18.0	15.2
2008	5	753	180	11,418	4.50	28.7	20.0
2009	14	6,451	1,717	3,015	7.62	40.6	14.3
2010	19	7,886	1,634	5,883	6.56	41.1	10.5
2011	27	2,097	1,575	4,049	7.37	21.2	33.3
2012	20	1,776	799	2,069	8.74	31.5	25.0
2013	45	11,034	1,843	3,176	8.73	31.8	11.1
2014	42	4,246	604	3,801	8.69	25.4	19.0
2015	23	3,211	1,288	3,434	8.83	23.4	26.1
2016	14	17,530	1,023	2,007	8.23	43.4	14.3
2017	34	12,606	894	3,570	8.89	33.4	14.7
2018	32	2,430	1,162	4,888	8.80	25.5	37.5
2019	33	2,335	1,430	5,907	8.86	30.4	51.5
2020	61	3,283	815	5,347	8.64	21.9	50.8
2021	139	2,921	390	5,885	8.61	24.1	40.3
2022	3	9,469	619	8,511	8.67	31.5	33.3
2023	15	852	1,201	8,696	8.85	31.5	46.7
2024	23	2,408	723	3,931	8.67	34.6	39.1
Panel B: Summary statistics of issuing (IPO) firms							
	Mean	Std.	P5	P25	P50	P75	P95
Total assets ($MM)	5,640.83	23,100.56	67.37	298.43	900.43	2,600.89	11,074.40
Sales ($MM)	1,006.46	2,181.04	2.63	106.89	298.70	817.54	4,103.27
Market cap. ($MM)	4,660.01	6,984.58	500.00	1,404.44	2,528.89	4,514.72	15,638.34
Underwriter ranking	8.45	2.40	7.13	9.00	9.00	9.00	9.00
Firm age (years)	27.44	29.80	2.54	8.40	16.30	35.88	92.73
VC backing (%)	31.44	46.47	0.00	0.00	0.00	100.00	100.00
Panel C: Summary statistics of rival firms							
	Mean	Std.	P5	P25	P50	P75	P95
Market cap. ($MM)	6,308.12	20,107.23	14.26	138.39	684.82	3,066.52	29,276.15
Firm age (years)	34.95	34.04	5.00	13.00	23.00	41.00	113.00
Book-to-market	0.64	2.59	0.10	0.17	0.37	0.67	1.56
Leverage	58.65	252.50	-124.80	2.41	26.42	79.63	328.72
ROA	-10.98	39.88	-89.28	-13.15	2.81	8.07	19.55
Idiosyncratic vol.	0.57	0.50	0.17	0.29	0.44	0.68	1.36
Panel D: Treatment and environmental-classification dummies							
	Mean	Std.	P5	P25	P50	P75	P95
Green IPO	0.240	0.427	0.00	0.00	0.00	0.00	1.00
Rival	0.500	0.500	0.00	0.00	0.00	1.00	1.00
Brown rival	0.416	0.493	0.00	0.00	0.00	1.00	1.00

Note: This table reports the distribution of IPOs in our sample and the summary statistics of the main variables, over 2007–2024. Panel A reports the yearly distribution of IPOs and the mean of the main issuing-firm variables by listing year. Panel B reports summary statistics for the issuing (IPO) firms: total assets and sales are taken from the IPO-prospectus accounting data (EDGAR) for the fiscal year of the IPO (or the closest available year); market capitalization is the value at the deal; underwriter ranking is the lead-underwriter rank; firm age is years since founding; and VC backing is the percentage of venture-backed IPOs. Panel C reports statistics for the rival firms at the rival firm–year level (each rival firm–year is counted once, regardless of the number of IPO events to which it is matched): market capitalization, firm age, book-to-market, leverage, return-on-assets, and idiosyncratic volatility. Panel D reports the treatment and environmental-classification indicators used in the regressions; for these dummies we report only the number of observations, the mean (i.e. the share of ones) and the standard deviation. All continuous variables are winsorised at the 1% and 99% levels; dollar amounts are in millions of USD.

Table 3: USA – IPOs with Highest and Lowest Industry-Adjusted Climate-Opportunity Score

IPO	IPO date	SIC	Raw score	Industry mean	Adj. score
Panel A: Most "green" (highest adjusted score)					
Montauk Renewables Inc	Jan 2021	49	10.80	2.90	7.90
Livent Corp	Oct 2018	28	7.02	0.20	6.82
FTC Solar Inc	Apr 2021	36	8.18	1.42	6.76
Methes Energies International	Oct 2012	28	6.95	0.20	6.75
TPI Composites Inc	Jul 2016	35	7.53	1.07	6.46
Renewable Energy Group Inc	Jan 2012	28	6.37	0.20	6.17
Solazyme Inc	May 2011	28	6.22	0.20	6.01
Phoenix Motor Inc	Jun 2022	37	7.58	1.87	5.70
BioAmber Inc	May 2013	28	5.52	0.20	5.31
GrafTech International Ltd	Apr 2018	36	6.70	1.42	5.27
Panel B: Most "brown" (lowest adjusted score)					
PAA Natural Gas Storage LP	Apr 2010	49	0.00	2.90	-2.90
Targa Resources Corp	Dec 2010	49	0.00	2.90	-2.90
American Midstream Partners LP	Jul 2011	49	0.00	2.90	-2.90
Tesoro Logistics LP	Apr 2011	49	0.00	2.90	-2.90
Oxford Resource Partners LP	Jul 2010	12	0.00	2.30	-2.30
Varca Ventures Inc	Aug 2010	14	0.13	2.34	-2.22
Levi Strauss & Co	Mar 2019	23	0.25	2.38	-2.14
Western Gas Partners LP	May 2008	49	0.77	2.90	-2.14
Perfect Moment Ltd.	Feb 2024	23	0.28	2.38	-2.10
Western Gas Equity Partners LP	Dec 2012	49	0.87	2.90	-2.03

Note: This table reports the IPO firms with the highest (Panel A) and lowest (Panel B) industry-adjusted climate-opportunity score over 2007–2024. The raw score is the share of climate-opportunity text blocks in the firm's IPO prospectus, computed as $(Clim\_Opp/Total\ blocks) \times 100$. The adjusted score subtracts the mean of this raw score across all IPOs in the firm's two-digit SIC industry.

Table 4: USA – Within-Industry Dispersion in Climate-Opportunity Greenness

		Greenest firm		Brownest firm		
Industry (2-digit SIC)	N	Firm	Adj.	Firm	Adj.	Spread
49 – Electric, Gas & Sanitary	44	Montauk Renewables Inc	+7.90	PAA Natural Gas Storage	-2.90	10.80
36 – Electronic Equipment	74	FTC Solar Inc	+6.76	Airvana Inc	-1.42	8.18
37 – Transportation Equip.	21	Phoenix Motor Inc	+5.70	Hennessy Capital Acquisi	-1.87	7.58
35 – Machinery & Computers	36	TPI Composites Inc	+6.46	Netezza Corp	-1.07	7.53
28 – Chemicals & Allied	542	Livent Corp	+6.82	ARYx Therapeutics Inc	-0.20	7.02
23 – Apparel	3	Allbirds Inc	+4.24	Levi Strauss & Co	-2.14	6.38
34 – Fabricated Metal	8	Sunrun Inc	+4.71	Toughbuilt Industries In	-1.56	6.27
13 – Oil & Gas Extraction	62	Select Energy Services I	+4.09	Oasis Petroleum Inc	-1.78	5.88
15 – Building Construction	12	Biofuel Energy Corp	+4.99	Smith Douglas Homes Corp	-0.66	5.65
73 – Business Services	354	Opower Inc	+4.77	BladeLogic Inc	-0.15	4.92
87 – Engineering & Mgmt	21	Zymergen Inc	+4.28	Information Services Gro	-0.53	4.80
26 – Paper & Allied	5	Pactiv Evergreen Inc	+2.83	Aldabra 2 Acquisition Co	-1.95	4.78
10 – Metal Mining	8	Ivanhoe Electric Inc.	+2.92	Molycorp Inc	-1.44	4.36
24 – Lumber & Wood	6	Enviva Partners LP	+3.23	Legacy Housing Corp	-1.03	4.26
14 – Nonmetallic Minerals	6	Intrepid Potash Inc	+1.97	Varca Ventures Inc	-2.22	4.19
33 – Primary Metal	6	INNO HOLDINGS INC.	+2.19	Symmetry Holdings Inc	-1.93	4.12
30 – Rubber & Plastics	9	AZEK Co Inc	+2.17	Berry Plastics Group Inc	-1.86	4.03
39 – Misc. Manufacturing	10	Array Technologies Inc	+3.03	Fuqi International Inc	-0.66	3.69
12 – Coal Mining	6	Foresight Energy LP	+1.09	Oxford Resource Partners	-2.30	3.38
20 – Food & Kindred Products	22	The Vita Coco Company, I	+2.10	Teavana Holdings Inc	-1.27	3.36
50 – Wholesale – Durable	15	Core & Main Inc	+2.51	Demand Media Inc	-0.84	3.35
75 – Auto Repair	5	Mister Car Wash Inc	+1.85	Hyrecar Inc	-1.12	2.97
51 – Wholesale – Nondurable	13	Hydrofarm Holdings Group	+1.74	DeHaier Medical Systems	-0.83	2.57
29 – Petroleum Refining	6	CVR Energy Inc	+1.57	Northern Tier Energy LP	-0.93	2.50
16 – Heavy Construction	3	Shimmick Corp	+1.09	Construction Partners In	-1.36	2.45
59 – Misc. Retail	32	ThredUp Inc	+1.97	GNC Holdings Inc	-0.44	2.41
40 – Railroad Transport	2	USD Partners LP	+1.07	RailAmerica Inc	-1.07	2.15
48 – Communications	17	RigNet Inc	+1.56	Virgin Mobile USA, Inc	-0.24	1.80
70 – Hotels & Lodging	11	Brightview Holdings Inc	+1.22	Hyatt Hotels Corp	-0.40	1.63
52 – Building Materials	2	iPower Inc	+0.76	Stock Building Supply Ho	-0.76	1.51
79 – Amusement & Recreation	13	Intrawest Resorts Holdin	+1.18	Secure America Acq Corp	-0.26	1.44
45 – Air Transport	2	CHC Group Ltd	+0.72	Virgin America Inc	-0.72	1.44
46 – Pipelines (ex. gas)	12	PBF Logistics LP	+0.82	Valero Energy Partners L	-0.57	1.39
58 – Eating & Drinking	24	Sweetgreen, Inc.	+1.20	Bravo Brio Restaurant Gr	-0.17	1.37
32 – Stone, Clay & Glass	5	US Silica Holdings Inc	+0.88	Yulong Eco-Materials Ltd	-0.34	1.23
38 – Instruments & Measuring	115	Transmedics Group Inc	+1.06	EnteroMedics Inc	-0.15	1.21
44 – Water Transport	3	OSG America LP	+0.62	Norwegian Cruise Line Hl	-0.49	1.10
54 – Food Stores	9	Natural Grocers by Vitam	+0.75	57th Gen Acquisition Cor	-0.28	1.03
21 – Tobacco	3	Ispire Technology	+0.43	Turning Point Brands Inc	-0.50	0.93
80 – Health Services	49	Sotera Health Co	+0.67	Ensign Group Inc	-0.06	0.73
41 – Passenger Transit	2	Lyft Inc	+0.35	Uber Technologies Inc	-0.35	0.71
42 – Trucking & Warehousing	4	Schneider National Inc	+0.39	Swift Transportation Co	-0.20	0.60
53 – General Merchandise	7	BJ's Wholesale Club Hold	+0.30	Mercadolibre Inc	-0.11	0.42
55 – Auto Dealers & Gas	4	Carvana Co	+0.20	OneWater Marine Inc	-0.17	0.37
57 – Home Furnishings	9	Arhaus Inc	+0.14	Restoration Hardware Hld	-0.09	0.24
82 – Educational Services	8	Chegg	+0.12	American Public Educatio	-0.07	0.19
27 – Printing & Publishing	4	Multi Packaging Solution	+0.08	Warner Music Group Corp	-0.08	0.16
47 – Transport Services	3	Proficient Auto Logistic	+0.09	Orbitz Worldwide Inc	-0.05	0.15
56 – Apparel Stores	11	Burlington Stores Inc	+0.09	rue21	-0.04	0.12
78 – Motion Pictures	4	Cinemark Holdings Inc	+0.07	RHI Entertainment Inc.	-0.02	0.09

Note: For each two-digit SIC industry, the table reports the "greenest" and "brownest" IPO firm, defined as the firms with the highest and lowest industry-adjusted climate-opportunity score within the industry, over 2007–2024. The raw score is the share of climate-opportunity text blocks in the firm's IPO prospectus, $(Clim\_Opp/Total\ blocks) \times 100$; the adjusted score subtracts the industry mean. *Spread* is the difference between the two scores, and N is the number of IPOs in the industry. Industries are sorted by spread in descending order. Finance, insurance and real estate (SIC 60–69) are excluded.

Table 5: USA – Rival Firms' Greenness Variables: Distribution and Industry Means

Panel B: Mean and median by 2-digit SIC industry ($N \geq 20$)

		Scope 1		Scope 2		Scope 1+2		Intensity	
Industry (2-digit SIC)	N	Mean	Med.	Mean	Med.	Mean	Med.	Mean	Med.
44 – Water Transport	33	3,121.8	1,906.0	8.9	0.8	3,129.1	1,906.1	1,372.3	1,055.7
13 – Oil & Gas Extraction	272	3,510.0	1,693.0	841.6	228.7	4,384.0	1,900.0	503.3	394.3
70 – Hotels & Lodging	37	211.9	218.8	828.0	731.3	1,039.9	950.2	349.6	128.7
28 – Chemicals & Allied	666	1,690.9	203.4	874.5	183.1	2,649.6	432.7	335.3	47.4
30 – Rubber & Plastics	21	565.0	154.0	828.7	434.0	1,339.8	588.0	144.9	155.3
53 – General Merchandise	27	1,764.9	507.1	2,547.3	1,114.4	5,473.5	2,454.8	129.9	53.1
36 – Electronic Equipment	467	203.2	28.6	399.0	99.2	593.7	135.1	108.0	37.0
20 – Food & Kindred Prod.	158	841.2	270.0	694.9	337.0	1,509.7	676.8	94.1	76.4
87 – Engineering & Mgmt	66	203.3	2.8	26.6	12.0	226.8	15.3	92.9	4.4
58 – Eating & Drinking	40	152.2	122.2	340.3	149.7	492.5	322.3	68.1	69.2
54 – Food Stores	23	958.8	369.9	1,294.4	403.2	2,253.2	772.6	60.0	53.6
48 – Communications	76	295.2	110.0	1,680.6	946.5	1,971.9	1,219.6	59.5	39.5
37 – Transportation Equip.	206	357.6	95.7	597.2	229.1	950.1	325.5	44.8	33.4
35 – Machinery & Computers	241	126.0	43.2	283.3	133.1	409.3	184.3	42.5	32.0
38 – Instruments & Measuring	251	99.6	19.7	174.8	51.3	272.2	71.0	40.3	19.9
59 – Misc. Retail	76	570.4	18.7	537.3	111.6	1,107.7	148.0	39.9	18.9
50 – Wholesale – Durable	55	107.3	51.6	115.7	66.0	216.8	107.5	33.1	16.9
73 – Business Services	1,085	22.2	2.5	207.5	19.8	228.5	25.7	29.5	7.7
51 – Wholesale – Nondurable	40	174.4	75.9	133.9	103.0	308.4	168.5	23.8	15.8
80 – Health Services	25	105.6	60.2	195.4	98.8	281.2	183.9	22.4	21.4

Note: The table reports the variables used to classify rival firms as green or brown, at the rival firm–year level. Panel A reports the distribution of GHG emissions (Scope 1, Scope 2 and their sum, in thousand tonnes of CO_2 equivalent), and GHG intensity (tonnes of CO_2e per million USD of revenue), and the Refinitiv Asset4 environmental (E) pillar score. Panel B reports industry means and medians by two-digit SIC (industries with $N \geq 20$), sorted by GHG intensity. GHG and intensity statistics are computed on the firm–years with available GHG data (N reported). Revenues are from the listed-firms accounting database. Continuous variables are winsorised at the 1% and 99% levels.

Table 6: USA - Spillover Effects: Cumulative Abnormal Returns (CARs)

	(1) CAR(-10,+5)	(2) CAR(-10,+20)	(3) CAR(-10,+7)	(4) CAR(-10,+15)	(5) CAR(-10,+10)	(6) CAR(-10,+1)	(7) CAR(-5,+1)	(8) CAR(-5,+5)
Rival	-0.259	-0.984***	-0.422**	-0.851***	-0.578***	-0.350**	-0.148	-0.056
	(0.185)	(0.299)	(0.198)	(0.268)	(0.216)	(0.176)	(0.124)	(0.146)
Leverage	0.000	0.000*	0.000*	0.000*	0.000	0.000	0.000*	0.000*
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
ROA	0.001	0.014***	0.001	0.012***	0.005*	0.000	0.000	0.001
	(0.002)	(0.004)	(0.003)	(0.003)	(0.003)	(0.002)	(0.002)	(0.002)
BM	-0.056*	-0.104**	-0.040	-0.082**	-0.057	-0.024	0.016	-0.017
	(0.030)	(0.042)	(0.032)	(0.039)	(0.035)	(0.025)	(0.020)	(0.025)
Size	-0.415***	-0.835***	-0.487***	-0.664***	-0.579***	-0.328***	-0.183***	-0.271***
	(0.058)	(0.093)	(0.063)	(0.079)	(0.069)	(0.051)	(0.035)	(0.046)
Age	0.193***	0.650***	0.287***	0.513***	0.359***	0.136**	0.132***	0.189***
	(0.065)	(0.106)	(0.072)	(0.092)	(0.079)	(0.057)	(0.043)	(0.053)
Idio. Vol.	-0.921***	-2.150***	-1.072***	-1.423***	-1.345***	-0.761**	-0.303	-0.463*
	(0.294)	(0.423)	(0.320)	(0.382)	(0.351)	(0.311)	(0.193)	(0.246)
Constant	11.354***	17.379***	10.872***	13.768***	13.030***	9.354***	6.097***	8.098***
	(0.957)	(1.519)	(1.026)	(1.302)	(1.135)	(0.880)	(0.569)	(0.744)
Event FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	155,684	155,684	155,684	155,684	155,684	155,684	155,509	155,509
R^2	0.067	0.086	0.074	0.081	0.076	0.065	0.058	0.060

Note: This table presents OLS estimates of cumulative abnormal returns (CARs) on rival firms. Standard errors clustered at the event level are reported in parentheses. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

Table 7: USA - Spillover Effects: Green IPOs effect

	(1) CAR(-10,+5)	(2) CAR(-10,+20)	(3) CAR(-10,+7)	(4) CAR(-10,+15)	(5) CAR(-10,+10)	(6) CAR(-10,+1)	(7) CAR(-5,+1)	(8) CAR(-5,+5)
Green IPO	9.242***	11.082***	8.596***	9.392***	9.573***	7.730***	5.029***	6.542***
	(0.281)	(0.455)	(0.299)	(0.404)	(0.316)	(0.265)	(0.181)	(0.220)
Rival	-0.275	-1.035***	-0.436*	-0.962***	-0.586**	-0.291	-0.095	-0.079
	(0.230)	(0.394)	(0.252)	(0.348)	(0.280)	(0.223)	(0.155)	(0.184)
Green IPO × Rival	-1.078**	-1.372*	-1.131**	-1.400**	-1.396***	-1.005**	-0.548*	-0.623*
	(0.448)	(0.743)	(0.489)	(0.666)	(0.511)	(0.453)	(0.307)	(0.360)
Leverage	0.000*	0.001**	0.000**	0.001**	0.000*	0.000*	0.000*	0.000*
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
ROA	0.002	0.018***	0.003	0.015***	0.008**	0.001	0.001	0.002
	(0.003)	(0.004)	(0.003)	(0.004)	(0.003)	(0.003)	(0.002)	(0.002)
B/M ratio	-0.055*	-0.108**	-0.043	-0.077*	-0.053	-0.017	0.026	-0.012
	(0.032)	(0.047)	(0.035)	(0.043)	(0.040)	(0.028)	(0.022)	(0.027)
ln(Market Cap)	-0.418***	-0.827***	-0.489***	-0.663***	-0.584***	-0.322***	-0.172***	-0.268***
	(0.066)	(0.103)	(0.072)	(0.087)	(0.078)	(0.058)	(0.038)	(0.052)
ln(Age)	0.280***	0.743***	0.377***	0.620***	0.439***	0.209***	0.163***	0.233***
	(0.074)	(0.119)	(0.081)	(0.104)	(0.090)	(0.063)	(0.049)	(0.063)
Idiosyncratic Vol.	-0.975***	-1.922***	-1.196***	-1.317***	-1.440***	-0.803**	-0.277	-0.449
	(0.329)	(0.487)	(0.356)	(0.434)	(0.402)	(0.359)	(0.214)	(0.285)
_cons	2.302**	6.355***	2.490**	4.573***	3.850***	1.671*	0.972*	1.604**
	(0.934)	(1.464)	(1.015)	(1.267)	(1.122)	(0.887)	(0.544)	(0.728)
Event FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	121562	121562	121562	121562	121562	121562	121423	121423
R^2	0.067	0.087	0.074	0.080	0.074	0.063	0.053	0.058

Note: This table presents OLS estimates of cumulative abnormal returns (CARs) on rival firms. Standard errors clustered at the event level are reported in parentheses. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

Table 8: USA - Disentangling green vs brown rivals

	(1) CAR(-10,+5)	(2) CAR(-10,+20)	(3) CAR(-10,+7)	(4) CAR(-10,+15)	(5) CAR(-10,+10)	(6) CAR(-10,+1)	(7) CAR(-5,+1)	(8) CAR(-5,+5)
Green IPO	9.211***	11.053***	8.551***	9.342***	9.493***	7.728***	5.018***	6.502***
	(0.239)	(0.389)	(0.251)	(0.341)	(0.270)	(0.217)	(0.157)	(0.193)
High-Emission Rival	-0.501**	-1.525***	-0.696***	-1.358***	-0.894***	-0.446**	-0.180	-0.236
	(0.238)	(0.393)	(0.254)	(0.352)	(0.285)	(0.226)	(0.163)	(0.192)
Green IPO × High-Emission Rival	-1.314***	-1.729***	-1.346***	-1.692***	-1.587***	-1.294***	-0.677**	-0.698**
	(0.392)	(0.658)	(0.423)	(0.601)	(0.453)	(0.396)	(0.303)	(0.348)
Leverage	0.000*	0.001**	0.000**	0.001**	0.000*	0.000*	0.000*	0.000*
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
ROA	0.002	0.018***	0.002	0.015***	0.008**	0.001	0.001	0.001
	(0.003)	(0.004)	(0.003)	(0.004)	(0.003)	(0.003)	(0.002)	(0.002)
B/M ratio	-0.055*	-0.106**	-0.042	-0.076*	-0.052	-0.016	0.026	-0.012
	(0.032)	(0.047)	(0.035)	(0.043)	(0.040)	(0.028)	(0.022)	(0.027)
ln(Market Cap)	-0.443***	-0.887***	-0.520***	-0.718***	-0.623***	-0.345***	-0.182***	-0.280***
	(0.068)	(0.107)	(0.074)	(0.091)	(0.080)	(0.060)	(0.039)	(0.052)
ln(Age)	0.274***	0.726***	0.368***	0.603***	0.426***	0.203***	0.160***	0.231***
	(0.073)	(0.118)	(0.080)	(0.103)	(0.089)	(0.062)	(0.049)	(0.062)
Idiosyncratic Vol.	-0.985***	-1.945***	-1.208***	-1.339***	-1.456***	-0.812**	-0.281	-0.453
	(0.329)	(0.486)	(0.355)	(0.433)	(0.401)	(0.358)	(0.214)	(0.285)
_cons	2.749***	7.394***	3.040***	5.506***	4.536***	2.067**	1.157**	1.840**
	(0.958)	(1.520)	(1.045)	(1.310)	(1.153)	(0.912)	(0.551)	(0.733)
Event FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	121562	121562	121562	121562	121562	121562	121423	121423
R^2	0.067	0.088	0.074	0.081	0.074	0.063	0.053	0.058

Note: This table presents OLS estimates of cumulative abnormal returns (CARs) on rival firms. Standard errors clustered at the event level are reported in parentheses. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

Table 9: USA - The Investor-Attention Mechanism: Abnormal Trading Volume as a Mediator

	(1) (-10,+5)	(2) (-10,+20)	(3) (-10,+7)	(4) (-10,+15)	(5) (-10,+10)	(6) (-10,+1)	(7) (-5,+1)	(8) (-5,+5)
Panel A: Effect of green IPOs on rivals' abnormal trading volume (Dep. var.: CAV)								
Green IPO	14.226***	22.674***	15.129***	24.048***	17.271***	11.912***	5.608***	7.921***
	(1.395)	(7.535)	(1.869)	(7.684)	(1.762)	(1.131)	(0.763)	(1.142)
High-Emission Rival	0.695	-16.778*	-2.568	-4.276	-2.325	0.162	-0.195	0.338
	(1.263)	(9.808)	(4.024)	(4.885)	(3.851)	(0.801)	(0.422)	(1.094)
Green IPO × High-Emission Rival	-2.659	-4.569	0.354	-7.400	-0.931	-2.612*	-1.969*	-2.015
	(2.399)	(29.427)	(4.329)	(26.189)	(4.262)	(1.362)	(1.187)	(2.344)
Leverage	-0.000	0.001	-0.000	0.001	-0.001	0.000	-0.000	-0.001
	(0.001)	(0.007)	(0.001)	(0.002)	(0.001)	(0.001)	(0.001)	(0.001)
ROA	0.034*	0.268***	0.071**	0.186***	0.106**	-0.004	-0.001	0.037*
	(0.020)	(0.080)	(0.033)	(0.062)	(0.043)	(0.008)	(0.007)	(0.019)
B/M ratio	-0.347***	-3.460***	-0.674**	-2.009***	-0.948**	-0.151***	-0.110***	-0.306***
	(0.083)	(0.979)	(0.300)	(0.696)	(0.405)	(0.044)	(0.038)	(0.081)
ln(Market Cap)	-2.196***	-6.489***	-2.518***	-3.727***	-3.115***	-1.627***	-1.001***	-1.570***
	(0.397)	(1.223)	(0.426)	(0.842)	(0.550)	(0.339)	(0.220)	(0.303)
ln(Age)	-0.780	-8.397*	-1.337**	-4.348	-1.108*	-0.833**	-0.314	-0.261
	(0.512)	(4.503)	(0.620)	(2.748)	(0.642)	(0.395)	(0.290)	(0.432)
Idiosyncratic Vol.	4.115	66.108***	10.056*	38.431***	16.188**	-1.247	-0.091	5.271*
	(2.841)	(17.756)	(5.692)	(12.778)	(7.161)	(1.353)	(1.223)	(2.776)
Constant	26.712***	99.315***	32.095***	48.742***	36.350***	22.700***	12.691***	16.702***
	(6.290)	(19.744)	(6.926)	(9.885)	(7.874)	(5.748)	(3.922)	(4.677)
Event FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	80,992	80,107	80,984	80,941	80,967	81,006	81,006	80,992
R^2	0.005	0.007	0.003	0.005	0.004	0.005	0.005	0.004
Panel B: Effect of abnormal trading volume on rivals' cumulative abnormal returns (Dep. var.: CAR)								
CAV	0.009***	0.000**	0.001	0.000	0.000	0.017***	0.021***	0.008***
	(0.002)	(0.000)	(0.001)	(0.000)	(0.001)	(0.005)	(0.005)	(0.003)
Leverage	0.000**	0.001**	0.001**	0.001**	0.001**	0.000	0.000	0.000*
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
ROA	0.000	0.007*	-0.001	0.007*	0.003	0.000	0.001	0.001
	(0.003)	(0.004)	(0.003)	(0.004)	(0.004)	(0.003)	(0.002)	(0.002)
B/M ratio	-0.109***	-0.225***	-0.116***	-0.183***	-0.142***	-0.082***	-0.030	-0.057**
	(0.032)	(0.051)	(0.034)	(0.044)	(0.038)	(0.026)	(0.020)	(0.027)
ln(Market Cap)	-0.391***	-0.852***	-0.492***	-0.698***	-0.607***	-0.283***	-0.163***	-0.272***
	(0.055)	(0.090)	(0.059)	(0.073)	(0.065)	(0.046)	(0.032)	(0.041)
ln(Age)	0.184**	0.748***	0.293***	0.550***	0.396***	0.083	0.069	0.171***
	(0.078)	(0.117)	(0.087)	(0.112)	(0.096)	(0.069)	(0.051)	(0.063)
Idiosyncratic Vol.	-0.961***	-2.961***	-1.229***	-2.149***	-1.658***	-0.659**	-0.367*	-0.655**
	(0.355)	(0.555)	(0.397)	(0.503)	(0.461)	(0.294)	(0.218)	(0.283)
Constant	9.218***	18.141***	10.414***	14.657***	12.331***	8.229***	5.089***	6.057***
	(0.946)	(1.496)	(1.007)	(1.286)	(1.140)	(0.822)	(0.560)	(0.706)
Event FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	103,111	101,213	103,103	103,052	103,083	103,126	103,123	103,108
R^2	0.080	0.097	0.084	0.090	0.085	0.081	0.078	0.073

Note: This table reports the two-stage analysis of the investor-attention mechanism (HP4), using abnormal trading volume (CAV) as a proxy for investor attention (Barber and Odean, 2008). *Panel A* regresses rivals' cumulative abnormal trading volume (CAV) on the *Green IPO* indicator, the *High-Emission Rival* indicator (equal to one for rivals whose GHG intensity exceeds the 75th percentile of the industry distribution or that do not disclose emissions), their interaction, and firm-level controls. *Panel B* regresses rivals' cumulative abnormal returns (CAR) on abnormal trading volume (CAV) and the same controls. All specifications include IPO-event fixed effects; standard errors clustered at the event level are reported in parentheses. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.