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2024 US election: The climate for green and brown portfolios☆

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ABSTRACT

This study examines the short-term stock price reactions of green and brown stocks following Donald Trump's victory in the 2024 U.S. Presidential election. Using an event-study methodology, we analyze Cumulative Abnormal Returns (CARs) for portfolios constructed based on environmental sustainability criteria, as ESG-based scores, and CO_2 emission intensity metrics. Our findings indicate that classification criteria significantly influence market reactions. Brown portfolios (low ESG scores) generally outperformed green portfolios (high ESG scores) post-election, reflecting investor expectations of relaxed environmental regulations favoring carbon-intensive industries. Conversely, when portfolios are classified by CO_2 emission intensity, green portfolios (low CO_2 emissions) outperformed brown portfolios (high CO_2 emissions), suggesting investors prioritize direct environmental impact metrics in the short term. The study also emphasizes the importance of the factor model used to estimate theoretical returns, as different approaches yield varying magnitudes and dynamics of CARs. Specifically, size and value factors are found to play a critical role in shaping the CARs of green and brown portfolios around the election. An additional regression analysis reveals that market volatility, public attention to climate change, and political sentiment (particularly rising attention to Trump) significantly influenced the CARs of green and brown portfolios, albeit with differing effects. Green sentiment, however, had no significant impact on CARs. These results highlight the complex interplay between political events, investor sentiment, and sustainability-related market dynamics.

> *"They've spent trillions of dollars on things having to do with the green new scam. It's a scam, and that's caused tremendous inflationary pressures. In addition to the cost of energy and all of the trillions of dollars that are sitting there not yet spent. We will redirect that money for important projects like roads, bridges, dams, and we will not allow it to be spent on meaningless green new scam ideas."*
>
> Donald Trump on July 19th, 2024 (Wisconsin)

1. Introduction

The most recent presidential election and the subsequent election of Donald Trump marked a key moment in the trajectory of global climate policies and their economic impacts. Among contemporary events, this election stands out for its potential influence on

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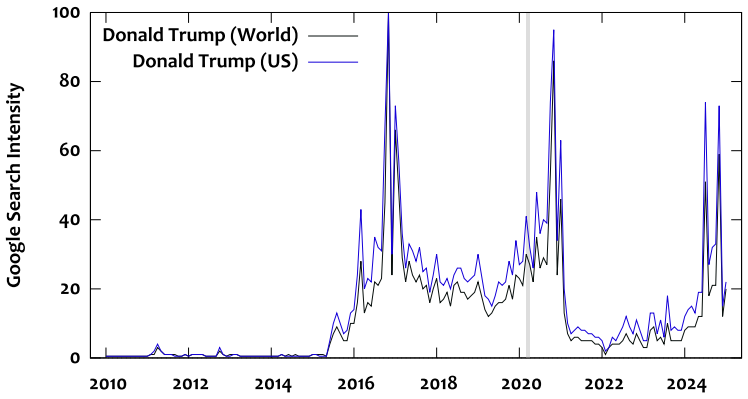
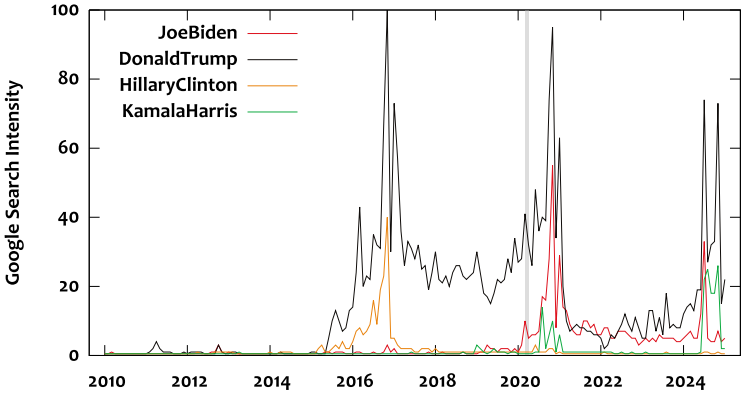


(a) Google Search intensity of "Donald Trump" at the national vs. global level.



(b) Google Search intensity of "Donald Trump" vs. his three previous opponents.

Fig. 1. Trends in Public Interest for "Donald Trump" and Other U.S. Presidential Candidates.
Notes: Panel (a) depicts the evolution of the "raw" Google search volume for Donald Trump in the U.S. (blue line) and in the World (black line). Panel (b) plots the frequency of Google searches (in the U.S.) for Donald Trump (black line) against internet search volumes for Joe Biden (red line), Hillary Clinton (orange line) and Kamala Harris (green line).

the green-minus-brown performance—a metric comparing returns on environmentally sustainable ("green") versus carbon-intensive ("brown") investments. Its importance stems from the president's power to redirect federal policy priorities – favoring fossil fuel production and deregulation – while influencing regulatory frameworks (such as rolling back clean energy incentives and emissions standards) and shifting market expectations.

The election of a U.S. President has traditionally attracted significant global attention, given the profound impact of American policies on international markets, geopolitics, and environmental governance. However, this election cycle appears to command even greater scrutiny. As shown in Fig. 1, Panel (a), the intensity of Google searches both at the global level and in the U.S. for Donald Trump over the past 15 years has not only surged to unprecedented levels but has also consistently eclipsed those of all other candidates in the last three presidential elections. Specifically, Trump's search interest has overwhelmingly dominated that of Hillary Clinton, Joe Biden, and Kamala Harris, as shown in Fig. 1, Panel (b), highlighting the extraordinary degree of public and media focus surrounding his political trajectory. This heightened attention underscores the widespread perception that the election's consequences extend far beyond U.S. borders, carrying critical implications for global governance, economic stability, and climate action.

The 2024 Presidential campaign has been marked by an unusually polarized and aggressive debate on climate change. The two candidates, former President Donald Trump and Vice President Kamala Harris, presented starkly contrasting views on this critical issue. Kamala Harris emphasized the urgent need for action, describing global warming as an "*existential threat*". In contrast, Donald Trump dismissed climate change as "*one of the greatest scams of all time*". These divergent stances set the stage for intense public discourse and sharp divisions in policy proposals. Such polarization is not new but has reached a new level of intensity in this election cycle. As Barnett (2024) suggests, the expectations surrounding the implementation or removal of green policies significantly influence financial markets, particularly the valuation of carbon-intensive firms. This underscores the vital role political outcomes play in shaping economic incentives and investor behavior. The election's outcome raises critical questions about the dynamics of green and brown portfolio returns. Historically, markets have responded sensitively to signals about future regulatory

and policy landscapes. For example, the expectation of stricter environmental regulations under a potential Harris administration would likely enhance the attractiveness of green investments while diminishing the prospects for brown assets. Conversely, Trump's well-documented skepticism toward global warming and climate change could signal a relaxation of green policies, potentially boosting the short-term performance of carbon-intensive firms. The prospect of such anomalies in portfolio dynamics is particularly relevant in light of Trump's re-election. The anticipated rollback of green policies under his administration is expected to temporarily bolster brown portfolios while dampening the growth trajectory of green investments. However, the long-term implications remain uncertain, given the growing global consensus on the necessity of transitioning to a low-carbon economy. The 2024 U.S. Presidential election highlights the pivotal relationship between political leadership and global efforts to address climate change. The sharp contrast between Trump's and Harris's positions on climate policy has heightened the stakes, with significant implications for market dynamics and the valuation of green and brown assets. As policymakers, investors, and stakeholders evaluate the implications of the election, a comprehensive understanding of its broader economic and environmental consequences will be crucial to effectively navigate this key moment.

We investigate the short-term effects of the 2024 U.S. Presidential election on the performance dynamics of green and brown investment portfolios via a "single-date" event study. While event studies focusing on a single event are relatively rare in the financial literature, a notable recent example is provided by Ramelli et al. (2021a), who examine the reaction of European stock prices to the first Global Climate Strike on March 15th, 2019. Their study offers valuable insights into how financial markets respond to climate-related activism, revealing the potential for significant market movements even in response to non-traditional economic events. In our analysis, we focus on deviations in the returns of green and brown portfolios from their theoretical values following the election of Donald Trump, estimating Cumulative Abnormal Returns (CARs) around November 5th, 2024. Given the newly elected president's position on environmental and energy policies, it is reasonable to expect that firms heavily reliant on fossil fuels and other brown industries will experience a relative benefit from the election outcome. This could reflect a continuation of pro-fossil fuel policies and regulatory relief for carbon-intensive sectors. Importantly, such expectation may persist despite the growing global momentum toward sustainable policies, driven by commitments such as the Paris Agreement, international climate summits, and an increasing frequency of climate change-induced natural disasters, all of which intensify the urgency for action on climate change. At the same time, the rise in global green sentiment could lead to the opposite effect, where green portfolios – those composed of companies focused on sustainability and environmental responsibility – outperform brown portfolios, even in the aftermath of Trump's election. Briere and Ramelli (2023) provide evidence that rising green sentiment positively impacts the performance of environmentally responsible firms. Their novel green sentiment index highlights periods of "green optimism" as well as "green pessimism" indicating thus that the positive sentiment from those advocating for a greener, more sustainable economy may not be enough to offset the support for newly elected President Trump and his pro-fossil fuel policies. Given these competing forces – Trump's contrarian stance on green policies versus the growing positive global sentiment toward green initiatives – the direction of green/brown portfolio performance remains an empirical question. Our study aims also to shed light on which of these effects, the persistence of fossil fuel industry advantages or the countervailing influence of global green sentiment, will dominate in the post-election period.

We utilize stock price data from firms listed in the S&P 500, the NYSE Composite and the NASDAQ stock market indices (a total of 2430 firms) for the period from November 7th, 2023 to November 26th, 2024 to construct a heterogeneous set of green and brown investment portfolios. Our analysis is thus conducted at the portfolio level rather than at the individual-firm level, consistent with the event study literature on system-wide shocks, which commonly employs portfolio-based approaches to capture differential exposure while abstracting from idiosyncratic firm-level noise (see, e.g., Ramelli & Wagner, 2020; Bolton & Kacperczyk, 2021). The U.S. Presidential election is a market-wide political event affecting all firms, making a firm-level perspective less informative for our research question. By focusing on portfolios formed on environmental characteristics, we isolate economically meaningful differences in exposure between green and brown investment strategies. Moreover, portfolio-level results are directly relevant for international and institutional investors, who typically allocate capital across diversified portfolios rather than individual securities.

Unlike most of the recent literature, which primarily examines the impact of climate and green policies on equilibrium green and brown asset returns, we do not rely on a single classification criterion, such as carbon emission intensity, to distinguish between green and brown firms. Instead, we adopt a more comprehensive approach that incorporates multiple classification methods to assess the robustness of our findings. Specifically, we classify firms as green or brown using a variety of greenness-based criteria, i.e., ESG Score, ESG Combined Score, Environmental Pillar (EP) Score, CO_2-to-revenues ratio, and CO_2-to-employees ratio. The list of newly built green and brown portfolios is reported in Fig. 2. We further follow Battiston et al. (2017) who classify economic activities into Climate-Policy-Relevant Sectors (CPRS) and non-Climate-Policy-Relevant Sectors (non-CPRS) based on their exposure to climate-related transition risks. CPRS include industries that are directly affected by climate policies, such as fossil fuel extraction, energy production, transport, and industries with high greenhouse gas emissions. These sectors face risks from regulatory changes, carbon pricing, and shifts in market demand. Non-CPRS, on the other hand, include industries with minimal direct exposure to climate policies, meaning that their financial performance is less sensitive to regulatory or market shifts due to climate action. We therefore build two additional portfolios: (i) one composed by firms belonging to CPRS and (ii) one composed by firms belonging to non-CPRS.[1]

[1] Let us stress that the Battiston et al. (2017) classification into CPRS and non-CPRS does not directly label firms as green or brown. Instead, it assesses sectors based on their exposure to climate policy risks, not their environmental impact *per se*. A firm operating in a CPRS sector (e.g., energy, transport, heavy industry) could be green (e.g., renewable energy providers) or brown (e.g., coal mining). Similarly, non-CPRS firms are not necessarily green but are considered less exposed to transition risks. Thus, while the classification helps identify firms vulnerable to climate policies, it does not categorize them based on sustainability or carbon intensity.

Green Portfolios	Brown Portfolios
• Top 10% ESG Score	• Bottom 10% ESG Score
• Top 30% ESG Score	• Bottom 30% ESG Score
• Top 10% ESG Combined Score	• Bottom 10% ESG Combined Score
• Top 30% ESG Combined Score	• Bottom 30% ESG Combined Score
• Top 10% EP Score	• Bottom 10% EP Score
• Top 30% EP Score	• Bottom 30% EP Score
• Bottom 10% CO_2-to-revenues	• Top 10% CO_2-to-revenues
• Bottom 30% CO_2-to-revenues	• Top 30% CO_2-to-revenues
• Bottom 10% CO_2-to-employees	• Top 10% CO_2-to-employees
• Bottom 30% CO_2-to-employees	• Top 30% CO_2-to-employees

Fig. 2. List of green and brown portfolios.
Notes: This table illustrates a range of green and brown investment portfolios, each constructed using distinct criteria, including Environmental, Social, and Governance (ESG) ratings as well as CO_2 intensity metrics. The classification reflects varying sustainability approaches, where green portfolios prioritize lower carbon footprints and higher ESG scores, while brown portfolios encompass assets with higher emissions or lower ESG performance.

By adopting this multi-dimensional classification approach, we aim to examine how the criteria used to define a firm's "greenness" or "brownness" influence market dynamics and asset return patterns around a relevant climate policy-related event. More specifically, as later detailed in Section 3 we focus on an event window of ±10 days around Trump's 2024 election. In addition, for each classification criterion, we construct pairs of green and brown portfolios, each reflecting a different degree of environmental sustainability. More specifically, firms in the top 10% of the ESG-related scores distribution are considered in average greener than those in the top 30%. In other words, a portfolio comprising firms in the top 10% of ESG-related scores exhibits a higher degree of greenness than one based on the top 30% threshold. This approach allows us to assess the consistency and robustness of our findings in different definitions of environmental sustainability, offering a more comprehensive perspective on how these classifications shape investment outcomes.

When theoretical (expected/benchmark) returns are estimated using the standard one-factor market model (i.e., the CAPM), we observe that portfolios classified as brown exhibit significantly larger CARs compared to green portfolios, both in the period preceding and following the election day. However, this pattern is evident only when firms are categorized as green or brown based on their ESG Score, ESG Combined Score, and EP Score. Specifically, brown portfolios consistently generate positive CARs, whereas green portfolios experience negative CARs over the full post-event window. Notably, the green-brown divergence in CARs is particularly pronounced at the conclusion of the estimation window – ten days following Trump's election – where the difference exceeds 5%. This finding suggests that investors may have anticipated regulatory rollbacks or policy shifts favoring carbon-intensive industries under the newly elected administration, thereby reinforcing the market advantage of brown firms.[2] Furthermore, CARs for brown portfolios exhibit a gradual upward trend even before the event window (−10 to −1), which continues for two to three days post-election. This pattern may reflect anticipatory trading behavior among investors who, influenced by exit polls indicating a higher likelihood of a Trump victory, adjusted their market expectations in advance.[3] In contrast, CARs for green portfolios remain relatively stable or experience a modest decline in the lead-up to the event. This downward trend persists post-election, with CARs continuing to decline for nearly five days following the event.

However, a contrasting pattern emerges when firms are classified according to a criterion based on CO_2 emissions rather than ESG-related scores. Counterintuitively, portfolios constructed using firms in the bottom 10% or 30% of the CO_2-to-revenues or CO_2-to-employees distribution – clearly green firms by emissions standards – exhibit positive CARs. Ten days after the election,

[2] Our results align with prior research by Ramelli et al. (2021b), who documented a similar investor response to Trump's 2016 election, with a clear preference for brown firms over green firms.

[3] Supporting this hypothesis, prediction market data from early October 2024 indicated a 53.3% probability of a Trump victory according to Polymarket, whereas Kalshi's prediction market provided an even more optimistic estimate, assigning Trump a 61% likelihood of winning, with Harris at 39%.

these green portfolios record CARs averaging above 2%. Conversely, brown portfolios – comprising firms in the top 10% or 30% of the CO_2-to-revenues or CO_2-to-employees distribution (i.e., high carbon-intensive firms) – experience an initial decline in CARs within the first five days post-election, followed by a partial recovery beginning around day five. By the end of the event window, the CARs of brown portfolios remain lower in magnitude compared to green portfolios classified by emissions intensity.

When firms are categorized according to their climate-policy-relevance, following the classification by Battiston et al. (2017), we observe a sharp decline in CARs within the first two days after the election. Notably, this decline is more pronounced for climate policy-relevant firms, suggesting that companies directly exposed to climate-related regulations experienced heightened market uncertainty and pessimism regarding potential shifts in future policies. A brief rebound occurs three days after the event, but this is followed by another significant drop extending up to five days post-election. This pattern may reflect investor concerns over potential disruptions to green policy initiatives, increased regulatory uncertainty, or sector-specific vulnerabilities related to climate transition risks. Prior to the event (−10 to −1), CARs for both CPRS and non-CPRS portfolios show a consistent upward trend, indicating optimism or positive sentiment leading into the election.

Our findings demonstrate that green/brown classification criteria are a key determinant of how markets respond to major political events.[4] Notably, ESG-based green and brown portfolios are not perceived as distinctly "green" or "brown" in the same manner as CO_2 intensity-based portfolios. This divergence may arise from several factors, including potential inaccuracies in corporate reporting, differing investor interpretations, or a lack of confidence in ESG ratings and similar classification methods as reliable proxies for a firm's environmental impact. The contrasting outcomes underscore the inherent complexity of sustainability assessments in financial markets and emphasize the urgent need for more transparent, consistent, and robust environmental metrics. This conclusion is further supported by findings derived from broader classification frameworks, such as the distinction between CPRS and non-CPRS proposed by Battiston et al. (2017). These results suggest that market participants may respond more decisively to classifications rooted in objective measures of environmental impact, rather than those reliant on ratings, which are often susceptible to inconsistencies and subjective interpretation. The preference for objective metrics reflects a growing demand for clarity and reliability in sustainability assessments, particularly in the context of evolving regulatory landscapes and heightened investor focus on environmental risks. Ultimately, these insights call for a reevaluation of existing classification methodologies and the development of more standardized, data-driven approaches to assess corporate environmental performance. Such advancements would not only enhance market efficiency but also help to better align investment decisions with global sustainability goals.

When the oil price is incorporated as an additional factor alongside the market factor in estimating theoretical returns, results remain unchanged, reinforcing the robustness of our findings. A different picture emerges when alternative factor models are employed. For instance, when applying the Fama–French three-factor model (Fama & French, 1993) – or an extended version that includes oil price as an additional factor – we continue to observe brown portfolios outperforming green portfolios following Trump's election. However, the magnitude of CARs for both brown and green portfolios is notably lower compared to those derived from a one-factor model, with some instances even showing negative values. This variation in performance largely depends on the classification criteria used to define green and brown firms. Indeed, for most classification criteria, at the conclusion of the event window, CARs for both brown and green portfolios turn negative, with green portfolios exhibiting a more pronounced decline. For example, when classification criteria such as ESG Score, ESG Combined Score, or estimated CO_2 emissions per employee are used, CARs for brown portfolios at the end of the event window (+10) are equal to approximately −1%, while green portfolios experience a larger decrease, with CARs falling to around −3%. Furthermore, replacing the three-factor model with the more comprehensive Fama–French five-factor model (Fama & French, 2015) does not lead to significant changes in CAR dynamics. This suggests that the additional factors in the five-factor model do not materially alter the market's reaction to the election in terms of green and brown portfolio performance. Overall, the results show that although the choice of factor model influences the absolute magnitude of CARs, the relative outperformance of brown portfolios – defined using ESG-based greenness measures – remains robust. Broadly speaking, the varying CAR dynamics observed when using alternative and more comprehensive factor models suggest that drivers beyond just the market and oil price may influence the reaction of green and brown stock returns following Trump's election. In particular, our findings based on the Fama–French three- (or five-) factor model indicate that the size premium and value premium play significant roles in shaping these returns around key political events.[5]

We conclude our empirical analysis of short-term stock price reactions to Trump's victory by exploring the key drivers behind the estimated CARs of newly constructed green and brown portfolios. We hypothesize that equity market uncertainty – proxied by the CBOE Volatility Index (VIX) – and rising public attention to influential topics such as "climate change" (a central issue in the 2024 political campaign) and "Trump" (the anticipated winner) played a significant role in shaping CARs around the election period. Additionally, we introduce a proxy for green sentiment, measured by the frequency of Google searches for "green policy", to capture shifts in public interest toward environmental policies and their potential influence on market reactions. Our analysis reveals distinct patterns in stock price responses across portfolio types. For top ESG/EP portfolios (green), VIX positively influenced CARs, while heightened attention to "climate change" and "Trump" had a negative effect, likely reflecting increased uncertainty. However, green sentiment, as measured by searches for "green policy", had no significant impact. For bottom ESG/EP portfolios (brown), VIX remained a positive but statistically insignificant driver. Searches for "Trump" boosted CARs, whereas attention to "climate change" had no meaningful effect, highlighting a divergence in how climate-related sentiment influences green versus

[4] A similar conclusion emerges from the analysis of Fatica et al. (2021).

[5] A similar discussion on the stock price effect following the 2016 Trump's election can be found in Wagner et al. (2018), who pointed out that small stock exhibited a strong performance few days after the election. In fact, they observed that the results on the Fama–French size factor during the three days after the election were 1.89, 1.12, and 2.51%.

brown assets. In bottom CO_2 (low-emission) portfolios (green), neither VIX nor attention to "climate change" significantly affected CARs. However, searches for "Trump" positively influenced returns, in contrast to the negative impact observed in ESG/EP-based green portfolios. Green sentiment again showed no significant effect, underscoring the limited role of environmental policy interest in shaping returns for low-emission firms. For top CO_2 (high-emission) portfolios (brown), market volatility and most sentiment measures had little influence on CARs.

In summary, our findings reveal the intricate interplay between market volatility, political sentiment, and environmental policy interest in driving stock price deviations from fundamentals following Trump's victory. Green portfolios demonstrate heightened sensitivity to climate-related uncertainty and shifts in environmental policy sentiment compared to brown portfolios. These results underscore the necessity of integrating both financial and non-financial factors – such as political developments, regulatory expectations, and sustainability considerations – when analyzing market reactions to key political events. By doing so, stakeholders can better navigate the complex dynamics shaping investor behavior and market outcomes in an increasingly interconnected and policy-sensitive financial environment.

The remainder of the paper is structured as follows. Section 2 presents a brief review of the literature, focusing on the stock market impact of political elections. Section 3 details the methodology, data, and construction of green and brown portfolios. Empirical findings are reported and discussed in Section 4. Finally, Section 5 concludes the paper.

2. Related literature

The empirical literature exploring the impact of political elections on stock markets is expanding and is likely to remain a focal point of academic research. This paper seeks to contribute to this relatively small but rapidly growing body of work.

For the sake of conciseness, we limit our discussion to a subset of studies that are most directly relevant to our research. Specifically, we begin by examining the works of Wagner et al. (2018) and Ramelli et al. (2021b), both of which investigate the influence of political elections on stock market dynamics. These studies analyze market reactions in the immediate aftermath of the 2016 and 2020 U.S. Presidential elections, offering valuable insights into how electoral outcomes shape investor sentiment, market volatility, and asset price movements.

On the one hand, Wagner et al. (2018) investigate the stock market's reaction to Donald Trump's unexpected victory in the 2016 U.S. Presidential election. Utilizing an event study methodology, the authors analyze post-election stock price movements, focusing on the Russell 3000 Index. Their study further explores how firm-specific characteristics – such as corporate tax rates, deferred tax liabilities, and foreign market exposure – shape stock returns. A preliminary analysis reveals significant heterogeneity in firms' stock price reactions around the election date. Notably, both the average and median returns in the days following the election were driven largely by the strong performance of small-cap stocks, which markedly outperformed their large-cap counterparts during this period. Through cross-sectional regressions, where abnormal returns (adjusted for CAPM and Fama–French factors) serve as the dependent variable, the authors establish several key findings: (i) firms with high effective tax rates (ETRs) experienced the most substantial gains, as investors anticipated corporate tax cuts; (ii) firms with sizable deferred tax liabilities (DTLs) benefited from the prospect of lower future tax rates reducing these liabilities; (iii) domestically oriented firms outperformed internationally focused firms, likely due to concerns over potential trade restrictions; and (iv) firms with high foreign exposure or significant foreign-derived profits underperformed, reflecting market apprehension about protectionist trade policies. On the other hand, Ramelli et al. (2021b) examine how the unanticipated election outcomes of 2016 and 2020 influenced investor perceptions and stock valuations of firms with differing levels of carbon intensity and climate responsibility. In this regard, their work is particularly relevant to our study. Following Donald Trump's 2016 election and the subsequent appointment of climate skeptic Scott Pruitt as head of the Environmental Protection Agency (EPA), carbon-intensive firms experienced positive abnormal returns, as expected. However, contrary to conventional expectations, firms that had adopted proactive climate strategies also recorded gains, particularly those with a strong base of long-term investors. This suggests that some investors anticipated a future reversal – or "boomerang effect" – in climate policy. With Joseph Biden's 2020 election, signaling a renewed commitment to climate action, firms with robust climate responsibility strategies experienced positive stock market reactions, thereby validating the foresight of long-term investors who had anticipated this policy shift. Overall, their findings indicate that investors do not merely respond to immediate policy changes but also account for potential future regulatory reversals, rewarding firms that demonstrate proactive climate responsibility.

Similar to Wagner et al. (2018), Diercks et al. (2021) also investigate the dynamics of U.S. stock market returns following the 2016 Presidential election. However, rather than limiting their analysis to the immediate aftermath of the event, they extend their investigation to encompass market movements over a period of 283 days post-election. This extended timeframe allows them to assess the impact of anticipated tax cuts on stock market performance during the period between Donald Trump's electoral victory and the signing of the Tax Cuts and Jobs Act (TCJA). Employing a multi-faceted empirical approach, the authors find that expectations of forthcoming tax reductions played a significant role in driving market performance, contributing to the observed 25% increase in stock market valuations over this period. Their findings underscore the importance of policy expectations in shaping investor sentiment and market dynamics beyond the immediate post-election window.

Employing a non-linear interval model to analyze interval-valued time series data, which simultaneously captures both trend (expected return) and range (market efficiency/volatility), Sun et al. (2021) investigate the impact of Donald Trump's 2016 election victory on the U.S. stock market. Their findings indicate that the election resulted in an increase in the level of the S&P 500 index while simultaneously reducing market volatility, suggesting enhanced market confidence and efficiency. Using daily stock market data spanning from January 2015 to October 2017, the authors conclude that Trump's election functioned as an exogenous

uncertainty shock. However, rather than inducing prolonged market instability, it ultimately contributed to improved market efficiency and dampened volatility, highlighting the complex interplay between political events and financial market dynamics.

In the spirit of Wagner et al. (2018) and Diercks et al. (2021), Blanchard et al. (2018) also examine U.S. stock market performance in the aftermath of the 2016 Presidential election, with a particular emphasis on the effects of anticipated corporate tax reforms. Their analysis leverages daily S&P 500 index data from November 2016 to December 2017 to assess the extent to which expectations surrounding corporate tax cuts influenced market dynamics. The authors employ a multi-method empirical framework, consisting of: (a) time-series regression analysis to establish a link between stock price fluctuations, anticipated tax policy changes, and broader economic indicators; (b) an event study approach utilizing betting market probabilities and stock price movements to quantify the impact of corporate tax cut expectations; and (c) cross-sectional analysis to compare the stock price responses of firms with varying levels of tax exposure. Their findings reveal that: (i) dividend growth and expected tax policy changes collectively explain approximately 11–15% of the 25% increase in stock prices observed between the election and the end of 2017; (ii) corporate tax cuts alone accounted for an estimated 2–6% of the total stock market gain during this period; and (iii) the stock market's response to tax policy expectations was more pronounced for high-tax firms and small-cap stocks compared to low-tax firms, underscoring the differential effects of anticipated fiscal policies across firm characteristics.

Our work is closely related to these studies, as it examines the stock market's reaction following a U.S. Presidential election. However, a key distinction is that we focus on the most recent 2024 U.S. political election, allowing us to assess whether this time is different. Furthermore, rather than analyzing the aggregate stock market, we investigate the dynamics of various green and brown portfolios, constructed using multiple green and sustainability classification criteria. This approach enables us to determine whether the method of classifying firms as green or brown influences their market behavior in response to the anticipated relaxation of green policies following Trump's victory.

While writing this paper, we became aware of the contemporaneous contribution by Cosma et al. (2025), who analyze the U.S. stock market reaction to the 2024 Presidential election of Donald Trump, with particular attention to firms' environmental performance. Using an event study framework, they document that firms with stronger environmental scores experienced relatively worse market performance following the election, consistent with investors anticipating a shift toward less climate-friendly policies. Our study differs from theirs along several important dimensions. First, whereas Cosma et al. (2025) rely on firm-level environmental scores, we adopt a portfolio-based approach, constructing green and brown portfolios using multiple environmental classifications (ESG/EP-based scores, carbon intensity and climate-policy-relevance). This allows us to isolate systematic differences in exposure and to compare forward-looking and backward-looking environmental metrics. Second, their analysis is restricted to S&P 500 constituents, while we consider a broader and more representative universe of 2430 firms drawn from the S&P 500, NYSE Composite, and NASDAQ indices. Third, while Cosma et al. (2025) compute abnormal returns using a single-factor market model, we employ multiple benchmark models, highlighting how model choice affects the measurement of abnormal performance. Finally, rather than focusing on firm-specific covariates, we study the role of aggregate public-attention and sentiment channels – including political attention, climate change, and green policy sentiment – thereby providing a complementary perspective on how election-related shocks are transmitted to financial markets. Taken together, these differences allow us to move beyond documenting average market reactions and to shed light on the reallocation of returns between green and brown assets following a major political shock.

More distantly related to our study are empirical works that examine the implications of climate policy or policy-related events on the performance of brown and green portfolios, without exclusively focusing on key political elections. In these studies, political election dates constitute only a subset of the broader set of climate policy-related events analyzed (Barnett, 2024; Borghesi et al., 2022; Donadelli et al., 2019). These works explore how regulatory shifts, international climate agreements, and governmental policy decisions influence the valuation and risk dynamics of environmentally sustainable (green) and carbon-intensive (brown) assets, offering a broader perspective on the interaction between policy uncertainty and financial markets.

Among these studies, the work of Ramelli et al. (2021a) is particularly close to ours in terms of empirical strategy, as it – like our study – focuses on a single event. Specifically, the authors examine how the inaugural Global Climate Strike on March 15th, 2019, influenced stock prices, with a particular emphasis on firms exhibiting varying levels of carbon intensity. Employing an event study methodology, they analyze a broad sample of European firms to assess stock price reactions in the days surrounding the strike. Their analysis explores the cross-sectional relationship between stock returns and carbon intensity levels of firms, revealing that the unexpected success of the Global Climate Strike led to a decrease in the stock prices of carbon-intensive firms. This finding suggests that heightened public awareness and activism on climate-related issues can exert a negative impact on the market valuation of companies with significant carbon footprints, underscoring the role of social movements in shaping investor sentiment and asset pricing. Donadelli et al. (2019) draw upon a subset of the climate policy-related events, specifically focusing on those that signal the introduction of more stringent green policies. Using a standard event study methodology, they demonstrate that the oil sector – a canonical example of a brown industry – experiences negative CARs in the wake of events perceived as likely to undermine the cash flows of carbon-intensive firms. Their findings suggest that climate policy shifts, particularly those that tighten environmental regulations, can have a detrimental impact on the financial performance of firms operating in sectors with significant carbon footprints, further emphasizing the market's sensitivity to evolving climate-related policies. In a similar vein, Barnett (2024) conducts an event study analysis to assess the impact of climate-related transition events that alter the likelihood of a future green transition. Specifically, he examines events that either increase or decrease the probability of a climate transition that would restrict the use of fossil fuels. Events that heightened the likelihood of such a transition include President Barack Obama's announcement of the Clean Power Plan (08/03/2015), the publication of the carbon emissions rules for the Clean Power Plan (10/23/2015), and the adoption of the Paris Agreement at the conclusion of the IPCC's COP21 meeting (12/11/2015). Conversely, events that reduced the likelihood of a future climate transition include the U.S. Supreme Court's decision to put a hold on the EPA enforcing the Clean

Power Plan (02/09/2019), the election of Donald Trump as President of the U.S. (11/08/2016), and President Trump's executive order to review the Clean Power Plan (03/28/2017). Using daily returns from the 49 sector portfolios available on Ken French's website, Barnett (2024) finds that sectors most exposed to climate-related transition risks exhibit the largest increases (decreases) in CARs following events that decrease (increase) the likelihood of a future climate transition. These results highlight the sensitivity of market performance in sectors heavily reliant on fossil fuels to shifts in the perceived trajectory of climate policy.

Our study contributes to the growing body of literature on the relationship between climate policy-related events and stock market dynamics by providing novel empirical insights into the impact of a highly recent and politically significant event: Donald Trump's 2024 election victory. This event was widely anticipated to diminish the likelihood of implementing more stringent green policies, thereby creating a potentially favorable environment for brown portfolios. By examining the short-term stock price reactions of green and brown firms, we shed light on how investor expectations and market dynamics respond to shifts in political leadership and anticipated regulatory changes. Furthermore, we address the ambiguity often associated with defining brown and green firms by employing a diverse set of classification criteria, thereby ensuring a more robust and comprehensive analysis. Furthermore, we aim to explain the dynamics of CARs by considering the level of public attention to climate change issues and the political candidate (i.e., Donald Trump), adding an important layer of context to understanding how these factors may influence stock market reactions. Our findings advance understanding of how climate policy uncertainty affects financial markets and reveal sharply divergent responses between green and brown portfolios. The results highlight the need to account for both immediate market reactions and longer-term effects of political developments on sustainability-oriented investments. Overall, the analysis clarifies how political sentiment and regulatory expectations interact with environmental sustainability to shape market behavior, offering insights for policymakers, investors, and researchers

3. Empirical strategy

3.1. Methodology

Building on the event study literature, we analyze stock price reactions of green and brown portfolios to the 2024 U.S. Presidential election on November 5th, 2024, by estimating abnormal returns (ARs). We thus first estimate expected returns in the absence of the event and then compute ARs as the difference between actual and expected returns over a ±10-day event window. CARs are then obtained by summing ARs across the event window. A crucial element in conducting an event study is selecting a benchmark model to estimate the expected (or theoretical/normal) returns. Different empirical strategies exist in the literature, but the most commonly used methods to estimate expected returns include: (i) mean-adjusted returns; (ii) market-adjusted returns; and (iii) market model residuals (e.g., the CAPM). One notable limitation of the mean-adjusted method is that it neglects the impact of market-wide stock price movements in the benchmark return. In contrast, the market-adjusted returns method implicitly assumes that the "beta" of each stock equals one, which is clearly not always the case. Therefore, it is more accurate to incorporate the stock's specific "beta" when calculating ARs. For this reason, we choose to conduct our primary analysis by defining ARs as the residuals from the market model.

In practice, the AR of portfolio j at time t is defined as the difference between its realized return and its expected (normal) return. Following the recent empirical literature, we work with excess returns. Accordingly, ARs are defined as

$$AR_{j,t} = Z_{j,t} - NR_{j,t}, \tag{1}$$

where $Z_{j,t} = R_{j,t} - R_{f,t}$ denotes the excess return of portfolio j over the risk-free rate $R_{f,t}$, and $NR_{j,t}$ is the expected (normal) excess return, computed as follows:

$$NR_{j,t} = \hat{\alpha}_j + \hat{\beta}_{j,M} Z_{m,t}. \tag{2}$$

Here $\hat{\alpha}_j$ and $\hat{\beta}_{j,M}$ denote the estimated intercept and market beta for portfolio j, respectively. These parameters are obtained from the time-series regression

$$Z_{j,t} = \alpha_j + \beta_{j,M} Z_{m,t} + \varepsilon_{j,t},$$

with $Z_{m,t}$ representing the market excess return and $\beta_{j,M}$ capturing the sensitivity of portfolio j's returns to market movements. We estimate the parameters $\hat{\alpha}_j$ and $\hat{\beta}_{j,M}$ using data from the estimation window, which spans from $t_0 - 30$ to $t_0 - 250$, where t_0 corresponds to the event day—November 5th, 2025, the date of Donald Trump's election victory (**TE**).[6]

[6] In the case of the mean-adjusted model, the benchmark excess return $NR_{j,t}$ would be approximated by the average excess return during the estimation period, specifically:

$$NR_{j,t} = \frac{1}{T} \sum_{t=(t_0-250)}^{(t_0-30)} Z_{j,t}$$

where $T = (t_0 - 30) - (t_0 - 250) + 1$. In the case of the market-adjusted approach, the $NR_{j,t}$ would instead be modeled as the market return, i.e., $NR_{j,t} = Z_{m,t}$.

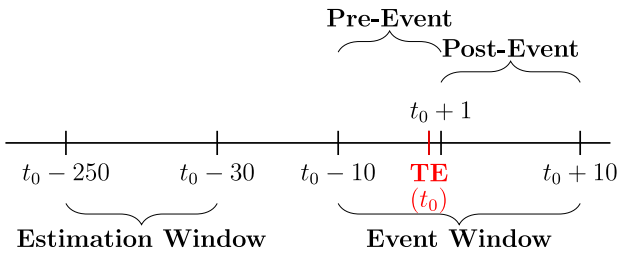


Fig. 3. Event study key Dates: the Case of the 2024 Trump Election (TE:= November 5th, 2024).

To obtain the CARs, we calculate the sum of the ARs over the event window. In our analysis, this window extends from ten days before the event ($t_0 - 10$) to ten days after the event ($t_0 + 10$), as depicted in Fig. 3, which also shows the key time-frames involved in the CARs computation. CARs are thus defined as:

$$CAR_{j,t} = \sum_{t=t_0-10}^{t_0+10} AR_{j,i} = \sum_{t=t_0-10}^{t_0+10} (Z_{j,i} - NR_{j,i}). \tag{3}$$

Beyond computing CARs as from Eq. (3), we also explore whether their evolution around the event date can be related to observable factors (e.g. aggregate market volatility, green policy attention or general population interest on Trump). To this aim, we estimate a linear regressions model in which, for each portfolio j, the CAR at time t is associated with a set of explanatory variables $X_{i,t}$. The general specification is:

$$CAR_{j,t} = \alpha_j + \sum_{i=1}^{N} \beta_{j,i} X_{i,t} + \epsilon_{i,t}, \tag{4}$$

where $X_{j,t}$ includes variables such as market volatility and public attention indicators. The empirical results of these regressions are reported and discussed in Section 4.

3.2. Data

In this section, we provide a detailed description of the data used to conduct our event study on the 2024 Trump election.

We begin by describing the firm-level data used to construct green and brown portfolios. These portfolios classify firms according to their environmental profiles and allow us to examine differential election effects on sustainable (green) and non-sustainable (brown) investments. A detailed description of the data sources, selection criteria, and processing procedures is provided in Section 3.2.1.

Next, we describe the factors used to estimate various factor models. These models are critical for computing benchmark returns, which serve as a reference for evaluating ARs during the event window. The factors include traditional market risk measures (e.g., market excess returns, size, value, and momentum). In addition, we introduce a set of supplementary variables that serve as potential drivers of abnormal returns. These variables, which include macroeconomic indicators, political sentiment measures, and firm-specific characteristics, are discussed in Section 3.2.2. By incorporating these additional data points, we aim to uncover the underlying factors influencing (abnormal) market reactions to the 2024 Trump election, providing a more nuanced understanding of investor behavior.

3.2.1. Firm-level data

The sample of firms is constructed to ensure representativeness across industries and market capitalization. To this end, we include all stocks listed in the (i) Standard&Poor's 500, (ii) NYSE Composite, and (iii) NASDAQ Stock Market indices as of December 31, 2024. Following standard event study practice, we exclude firms with market capitalization below the sample median, as well as firms for which market capitalization data are unavailable. This restriction reflects the longstanding concern that thin trading and illiquidity among small-cap stocks may distort abnormal return estimates due to non-synchronous trading (Brown & Warner, 1980) and bias beta estimation (MacKinlay, 1997). Consistent with recent studies, we therefore focus on liquid, large-cap firms with reliable return data (Ramelli et al., 2021b; Wagner et al., 2018). Our final sample includes 2430 stocks with price time series covering the period from September 2023 to November 2024.

Stocks are then classified as green or brown according to the following metrics. On the one hand, we rely on three ESG-related scores: (i) the Refinitiv ESG Score, an overall company score derived from self-reported data across the environmental, social, and corporate governance pillars; (ii) the Refinitiv ESG Combined Score, which adjusts the ESG Score by accounting for controversies; and (iii) the Environmental Pillar (EP) Score, evaluating how effectively a company mitigates environmental risks. On the other hand, we exploit two carbon intensity measures: (i) the estimated CO_2-to-revenues ratio; and (ii) the estimated CO_2-to-employees ratio. Green portfolios are then constructed by selecting the top 10% of stocks based on ESG-related scores or the bottom 10% based on carbon intensity measures. Conversely, brown portfolios are formed by selecting the bottom 10% of stocks according to

ESG/EP-related scores or the top 10% based on carbon intensity measures. We also construct portfolios using the top/bottom 30% of previous metrics, to enhance the robustness of results. Finally, we build two additional distinct portfolios by classifying firms according to their climate-policy-relevance, according to the classification proposed by Battiston et al. (2017). For this purpose, we map CPRS to NACE Rev2 4-digit codes and build a dummy variable accordingly. Details of this mapping are provided in Appendix A by Table A.1.

To construct portfolio excess returns, we first compute daily stock returns using dividend-adjusted closing prices. This ensures that our analysis is based on total-return series that incorporate dividends, avoid artificial price drops on ex-dividend dates, and provide a cleaner measure of investor returns. We then subtract the corresponding daily risk-free rate to obtain stock-specific excess returns. Portfolio excess returns are finally calculated as value-weighted averages of constituent stock excess returns, where weights are proportional to firms' market capitalization as of December 31st, 2024. These excess returns form the basis for all subsequent analyses.[7] Table 1 presents key statistical features of returns for green and brown portfolios, along with CPRS and non-CPRS portfolios.

Our decision to focus on portfolios of green or brown stocks, rather than individual stocks, is driven by several compelling reasons. First and foremost, constructing a portfolio that is broadly categorized as either green or brown allows for greater diversification across multiple companies, industries, and, in some cases, geographic regions. This diversification reduces idiosyncratic risk and enhances the stability of returns, as the performance of individual stocks is less likely to disproportionately impact the overall portfolio. Second, by spreading investments across a range of assets, the portfolio is less susceptible to extreme volatility compared to holding individual stocks. This mitigates the risk of significant losses due to company-specific events or sectoral downturns, providing a more balanced exposure to market movements. Additionally, analyzing portfolios rather than individual stocks aligns with the broader investment strategies often employed by institutional investors and fund managers, who typically allocate capital across a diversified set of assets to achieve specific sustainability goals or risk-return profiles. This approach also allows for a more comprehensive assessment of market trends and investor behavior in response to ESG factors. Finally, focusing on portfolios enables us to capture the aggregate market reaction to political or regulatory events, such as changes in climate policy, which may have systemic implications for green and brown industries as a whole. This perspective is particularly relevant in the context of our study, as it provides insights into how shifts in political sentiment and policy expectations influence the relative performance of sustainable versus carbon-intensive investments. In summary, our portfolio-based approach not only enhances the robustness and generalizability of our findings but also reflects the practical realities of modern investment practices, where diversification and risk management are of primary importance.[8]

3.2.2. Additional data

Additional data complementing the firm-level dataset serve two main purposes. First, they provide the factors needed to estimate expected returns using various asset-pricing models. Specifically, we include: (i) Fama--French factors for both the three- and five-factor specifications, along with the risk-free rate and market excess return used in the CAPM; and (ii) log-returns of West Texas Intermediate (WTI) crude oil. Second, additional time series are incorporated as regressors to analyze the dynamics CARs. These include Google Trends data for "climate change" (a proxy for climate-related uncertainty), "Trump" (capturing public attention to Trump), and "green policy" (proxying sentiment toward green policies), all filtered for the United States, as well as the CBOE Volatility Index (VIX), used as a measure of overall market sentiment.

4. Empirical results

4.1. Main evidence

The CARs, estimated using the standard CAPM, for various green and brown portfolios over the event window spanning from 10 days before to 10 days after the 2024 U.S. Presidential election, are presented in Fig. 4. The key empirical findings can be summarized as follows.

Environmental scores. Portfolio composed by stocks with the highest ESG-related scores, typically referred to as green portfolios, experienced a decline in CARs following Trump's election. In contrast, those with the lowest ESG-related scores, or brown portfolios, saw a notable increase in CARs. This trend holds across various ESG-related measures, i.e., the overall ESG Score, the ESG combined Score, and the EP score, as shown in Fig. 4, Panels (a) to (c). Most notably, one day after Trump's election, the CARs of both brown and green portfolios initially declined. However, while the CARs of brown portfolios remained positive, those of green portfolios stayed negative, as shown in Fig. 4, Panel (a). A closer examination reveals that the CARs of top ESG Score portfolio dropped to around −2% by the end of the event window, while the CARs of bottom ESG Score portfolio increased to approximately +2%. This resulted in a brown-minus-green gap of roughly 4%. This outperformance of brown portfolios in the aftermath of Trump's victory

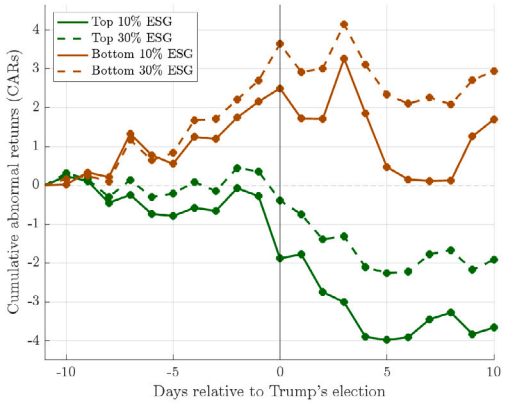
[7] Price time series and all other information used for portfolio construction are retrieved from the LSGE workspace, see: https://www.lseg.com/. Corresponding field codes are the following: `TR.CompanyMarketCap`, `TR.PriceClose`, `TR.TRESGScore`, `TR.TRESGCScore`, `TR.EnvironmentPillarScore`, `TR.F.TotRevenue`, `TR.F.EmpFTEEquivCurrDate`, `TR.AnalyticEstimatedCO2Total` and `TR.NACEClassification`.

[8] A *caveat* is necessary, however. The dataset, as obtained from the data provider, may contain errors or instances of misreporting, particularly in variables such as reported revenues or the number of employees. While some studies apply filtering criteria to refine their samples, we have opted to retain the full set of stocks that meet our initial market capitalization threshold to avoid the imposition of arbitrary constraints.

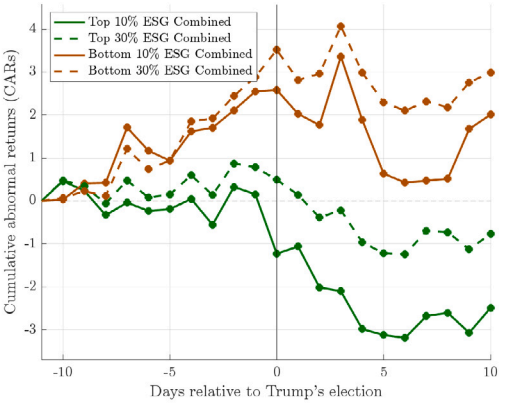
Table 1
Descriptive statistics of portfolio returns, based on different classification criteria.

Portfolio			Criterion		Mkt.Cap. (USD bn)		Portfolio returns			
Criterion	*Percentile*	*N Stocks*	*Mean*	*Std.Dev.*	*Mean*	*Std.Dev.*	*Mean*	*Std.Dev.*	*Skewness*	*Kurtosis*
Green portfolios										
ESG Score [0, 100]	Top 10%	233	82.3533	3.8541	29.2995	27.3613	0.0011	0.0077	−0.7122	4.6638
	Top 30%	700	74.4881	6.7404	21.3301	21.1890	0.0013	0.0085	−0.4719	4.4679
ESG Combined Score [0, 100]	Top 10%	233	76.6073	4.3747	12.6239	10.9027	0.0011	0.0078	−0.2193	3.8554
	Top 30%	700	67.6033	7.5804	9.5308	8.4140	0.0013	0.0080	−0.2521	3.6129
EP Score [0, 100]	Top 10%	233	86.9461	5.1597	30.3662	27.2372	0.0011	0.0088	−0.7747	4.7832
	Top 30%	700	76.0128	9.2266	22.4520	22.3008	0.0011	0.0077	−0.5588	4.3326
CO_2-to-revenues (tCO_2e/USD bn)	Bottom 10%	229	622.2655	365.3009	6.8606	6.4964	0.0011	0.0088	−0.6482	4.3277
	Bottom 30%	687	2,075.8503	1,291.5610	5.8770	5.4070	0.0017	0.0103	−0.2772	4.5208
CO_2-to-employees (tCO_2e/count)	Bottom 10%	225	0.4108	0.1781	5.1127	4.3797	0.0011	0.0104	−0.4599	3.6510
	Bottom 30%	674	1.0103	0.5222	4.5403	3.9365	0.0013	0.0084	−0.4204	3.7216
Brown portfolios										
ESG Score [0, 100]	Bottom 10%	233	17.9429	4.7969	2.2807	1.4570	0.0021	0.0168	−0.1064	2.7134
	Bottom 30%	700	28.1756	8.5536	2.7505	1.9304	0.0015	0.0107	−0.3004	3.2513
ESG Combined Score [0, 100]	Bottom 10%	233	17.1346	4.5390	2.3597	1.5759	0.0021	0.0148	−0.1480	2.7889
	Bottom 30%	700	26.4889	7.7734	3.1027	2.3923	0.0013	0.0086	−0.1806	3.3024
EP Score [0, 100]	Bottom 10%	233	2.4418	1.1051	2.3130	1.5137	0.0021	0.0170	−0.0002	2.7521
	Bottom 30%	700	12.8691	6.9341	2.7010	1.8503	0.0016	0.0120	−0.2171	2.9597
CO_2-to-revenues (tCO_2e/USD bn)	Top 10%	229	1,061,857.3020	703,112.6226	6.1422	5.7594	0.0011	0.0080	−0.1755	3.7127
	Top 30%	687	177,758.8558	160,494.3329	6.4255	5.9424	0.0011	0.0077	−0.2749	3.5187
CO_2-to-employees (tCO_2e/count)	Top 10%	225	1,464.1539	1069.8740	6.5517	6.5672	0.0007	0.0078	−0.3070	3.2078
	Top 30%	674	99.8135	106.2006	6.3556	6.0373	0.0010	0.0072	−0.6811	4.2238
Climate-policy-relevant and non-relevant portfolios										
Sector	Relevant	1193	n.a.	n.a.	5.6146	5.3575	0.0015	0.0094	−0.4018	4.4118
	Non-relevant	1237	n.a.	n.a.	5.1997	4.7131	0.0011	0.0079	−0.4940	3.9172

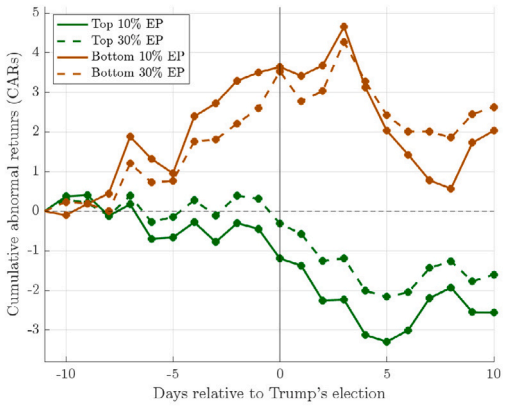
Notes: Portfolio returns are computed as value-weighted averages of constituent stock returns. The period over which these statistics are calculated aligns with that used for factor model estimation, spanning from November 7th, 2023, to September 24th, 2024, corresponding to −250 to −30 trading days before the event date. The number of stocks included in each portfolio varies depending on the availability of the classification criteria.



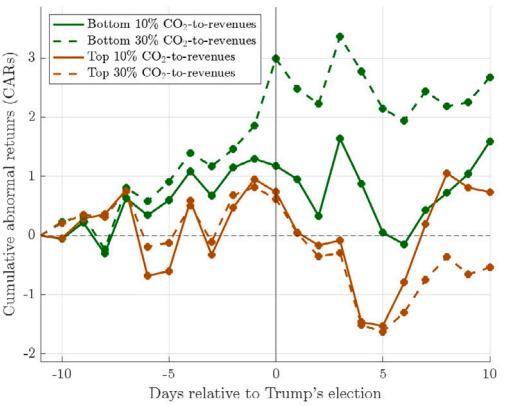
(a) ESG Score.



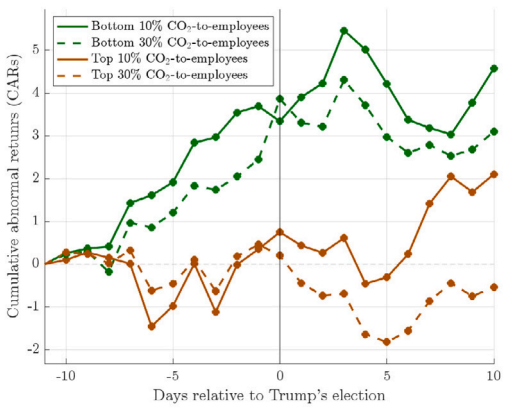
(b) ESG Combined Score.



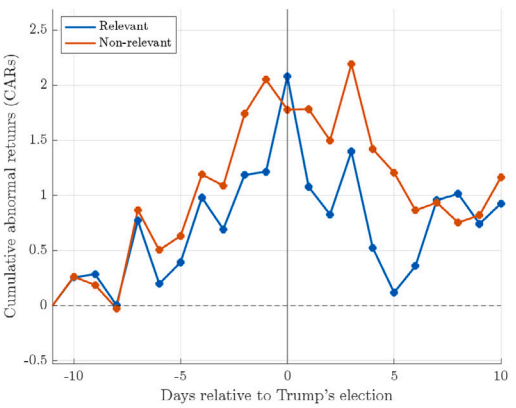
(c) EP Score.



(d) Estimated CO_2-to-revenues ratio.



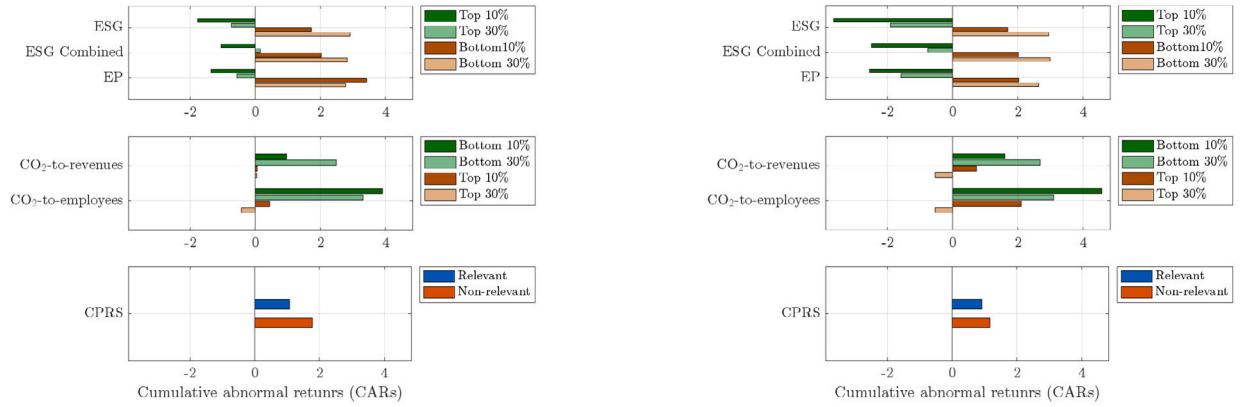
(e) Estimated CO_2-to-employees ratio.



(f) Climate-policy-relevance.

Fig. 4. CARs around Trump's 2024 election day: green vs. brown and CPRS vs. non-CPRS portfolios.
Notes: This figure illustrates the dynamics of CARs surrounding the U.S. Presidential election on November 5th, 2024. CARs are calculated following the methodology detailed in Section 3.1.

is clearly illustrated in Fig. 5, which summarizes the CARs for all portfolios one day, Panel (a), and ten days, Panel (b), after the event. Very similar patterns are observed when analyzing CARs based on the ESG Combined Score, depicted in Fig. 4, Panel (b), and on the EP Score, shown in Fig. 4, Panel (c). It is also worth noting that the CARs of brown portfolios (i.e., bottom ESG Combined



(a) After 1 day. **(b)** After 10 days.

Fig. 5. CARs one (left panel) and ten (right panel) days after Trump's 2024 election day.
Notes: This figure reports the CARs magnitude for different green and brown portfolios at one (left panel) and ten (right panel) days after Trump's 2024 election day. CARs are estimated as described in Section 3.1.

Score and EP Score portfolios) began to rise even in the days leading up to the event. This suggests that investors anticipated a regulatory environment less favorable to sustainable investing and, more importantly, the increasing likelihood of Trump's election over Kamala Harris. This pre-event upward trend in brown portfolios indicates that market participants were already positioning themselves in expectation of policy shifts that would benefit low-ESG firms.

In summary, brown portfolios (low ESG-related scores) exhibited a sustained upward trajectory, with CARs peaking between +2.5% to +3% by day 10. In contrast, green portfolios (high ESG-related scores) experienced a persistent decline, with CARs falling to -1% to -3.5% over the same period, as shown in Fig. 5, Panel (b) (top). Let us remark that this widening divergence suggests that investors anticipated long-term policy shifts favoring firms with low ESG-related scores, likely driven by expectations of regulatory rollbacks or a more lenient climate policy under the Trump administration. The market's reaction underscores the sensitivity of ESG-focused investments to political developments, highlighting the role of policy risk in shaping investor behavior. The observed trends reflect broader expectations that the new administration would deprioritize sustainability initiatives, thereby benefiting firms with lower ESG-related scores.

Carbon emission metrics. Surprisingly, when firms are classified as green or brown based on CO_2-based metrics, a different pattern in CARs emerges around Trump's election. Focusing first on the CO_2-to-revenues ratio metric, from Fig. 4, Panel (d) we observe that, on average, green portfolios outperform brown ones. By the end of the event window, the gap between the bottom 30% of firms with the lowest CO_2-to-revenues ratios (green portfolio) and the top 30% with the highest CO_2-to-revenues ratios (brown portfolio) reaches approximately 3%, as clearly shown in Fig. 5, Panel (b) (middle). However, within the first two days following the election, the CARs of both green and brown portfolios experience a significant decline. The drop is more pronounced for brown firms, and their CARs remain suppressed for up to five days post-election. Interestingly, a rebound begins to take shape approximately five days after the shock, as illustrated in Fig. 4, Panel (d). When using an alternative carbon intensity measure – the CO_2-to-employees ratio – an even more puzzling picture emerges. The CARs of firms in the bottom CO_2-to-employees ratio portfolios exhibit a positive trend, starting about eight days before the election and continuing until three days afterward. However, a notable decline follows, lasting from three to eight days after the event, as depicted in Fig. 4, Panel (e). This suggests that while these firms initially benefited from their lower carbon intensity, they were not immune to the broader market shock triggered by the election. Overall, as seen in Fig. 4, Panel (d), green portfolios (bottom CO_2 emissions intensity portfolios) continue to outperform brown portfolios (top CO_2 emissions intensity portfolios) by the end of the event window, with a performance gap ranging between 2% and 3%, as confirmed by Fig. 5, Panel (b) (middle). Additionally, mirroring the trend observed in the top CO_2-to-revenues ratio portfolios, the CARs of the top CO_2-to-employees ratio portfolios also decline within the first five days post-election. This indicates that firms with higher carbon intensity, regardless of the specific CO_2 metric used, faced immediate negative market reactions following the election.

The divergence in CARs based on CO_2 metrics, compared to ESG-based classifications, highlights the complexity of investor behavior and the multifaceted nature of climate-related risks. While ESG-related scores capture a broader range of sustainability factors, CO_2 metrics provide a more direct measure of a firm's environmental impact, particularly its carbon footprint.[9] The

[9] Generally, ESG-based portfolios may perform differently from CO_2-based portfolios because they consider a broader set of factors. For example, a company might score well on governance and social factors but have a high carbon footprint, or *viceversa*. CO_2-based portfolios are more narrowly focused and may exclude or underweight entire sectors (e.g., energy) that could instead be included into green portfolios, according to ESG-related metrics, if they score well on other criteria. As a result, CO_2-based portfolios might have a higher concentration in low-carbon sectors like technology or healthcare, while ESG portfolios could include a more diversified set of industries. Recently, Zhang (2025) argue that carbon intensity—measured as carbon emissions scaled by sales—is the

outperformance of green portfolios based on CO_2 metrics suggests that investors may have placed greater emphasis on carbon intensity in the immediate aftermath of the election, possibly due to expectations of regulatory changes or shifts in market sentiment toward carbon-heavy industries. The initial decline in CARs for both green and brown portfolios in the first few days post-election reflects a broader market shock, likely driven by uncertainty surrounding the new administration's policies. However, the subsequent rebound and outperformance of green portfolios indicate that firms with lower carbon intensity were better positioned to recover from the initial shock, possibly due to their perceived resilience to future regulatory or market pressures.

In summary, the contrasting patterns in CARs based on CO_2 emissions intensity versus ESG-related metrics underscore the importance of considering multiple dimensions of sustainability when analyzing market reactions to political events. The findings suggest that while ESG-related scores provide valuable insights into a firm's overall sustainability profile, CO_2 emission intensity offers a more granular view of its environmental impact, which can be particularly relevant in the context of climate policy and regulatory expectations.

Climate-policy-relevance. Using the classification proposed by Battiston et al. (2017), which allows to classify firms as belonging to CPRS and non-CPRS, we uncover additional ambiguity. Notably, as shown in Fig. 4, Panel (f), both portfolios exhibit similar CAR dynamics, particularly in the post-event window. As illustrated in Fig. 5, there is little distinction between the CARs of CPRS and non-CPRS firms, both one day, Panel (a) (bottom) and ten days, Panel (b) (bottom), after the event.

This convergence in CARs dynamics raises questions about the classification criteria and its implications for understanding market reactions to climate policies. The classification used by Battiston et al. (2017) differs from other approaches, such as those based on ESG-related scores or CO_2 emission intensity metrics, which often provide a more granular mapping of green and brown firms. In contrast, the classification in CPRS focuses on industries that are directly impacted by climate policies, such as regulations aimed at reducing carbon emissions, promoting renewable energy, or enforcing environmental standards. Examples of such sectors include energy (especially fossil fuels), utilities, transportation, and heavy industries like steel and cement. However, this classification does not always provide a clear-cut distinction between firms that may benefit or suffer from the same climate policies. For instance, within the same sector, some firms may be better positioned to adapt to stricter regulations through investments in cleaner technologies, while others may face significant financial strain due to their reliance on carbon-intensive practices. This intra-sector heterogeneity can lead to divergent impacts on firms, even when they belong to the same CPRS.

Firms in CPRS are highly sensitive to changes in climate policy. For example, stricter carbon regulations can increase operational costs (Borghesi et al., 2025), reduce demand for carbon-intensive products, or lead to stranded assets, resulting in potential financial losses for firms that fail to adapt. Conversely, policies favoring renewable energy or green technologies can benefit firms that are aligned with the transition to a low-carbon economy, such as those in the renewable energy sector. Despite this, the classification does not fully account for the diverse responses of firms within the same sector to identical climate policies. This lack of granularity may explain why we observe similar CARs dynamics across the portfolios, as the market may not fully differentiate between firms with varying levels of exposure or adaptability within the same sector.

On the other hand, non-CPRS are those whose business models and profitability are not primarily driven by environmental regulations. These sectors include industries such as technology, healthcare, and consumer goods, which are less directly affected by climate policies. However, this does not mean that firms in these sectors are entirely insulated from climate-related risks or perceptions. According to other metrics, such as ESG ratings or carbon footprint analyses, some firms in non-CPRS may still be perceived as green or brown by investors. For example, a technology company with a strong commitment to sustainability may be viewed favorably, while another firm in the same sector with high energy consumption or poor environmental practices may be seen as less attractive. This perception can influence investor behavior and contribute to the observed CARs dynamics, even in sectors not directly targeted by climate policies.

The similarity in CARs dynamics between the two portfolios suggests that the market may not always distinguish clearly between CRPS and non-CRPS portfolios, at least in the short term. This could be due to broader market sentiment or macroeconomic factors overshadowing sector-specific impacts, leading to similar reactions across portfolios. Additionally, the classification criteria used by Battiston et al. (2017) may not fully capture the nuances of firm-level exposure to climate risks, resulting in overlapping market reactions. Even firms in non-CPRS may experience indirect effects from climate policies, such as changes in energy prices, supply chain disruptions, or shifts in consumer preferences toward sustainable products.

In summary, while the classification of firms into CPRS and non-CPRS provides a useful framework for analyzing the financial impacts of climate policies, it also introduces a degree of ambiguity. The observed similarity in CARs dynamics across both portfolios highlights the complexity of market reactions to climate policies and underscores the need for more granular approaches to classifying firms based on their exposure to climate risks.[10] Future research could benefit from integrating multiple metrics, such as ESG scores and carbon emissions data, to better capture the diverse impacts of climate policies on firms across different sectors.

primary metric for assessing carbon transition risk. This preference is supported by several key reasons. First, since carbon emissions tend to scale with a firm's operational size, using carbon intensity allows for a more reasonable and informative comparison across firms. Second, carbon intensity is the focal point for investors, particularly those aligned with net-zero investment strategies. As a result, carbon intensity metrics are considered the most reliable indicator of a firm's "greenness" or "brownness" in the context of climate risk. That said, ranking or prioritizing different sustainability criteria is not the aim of this article. Instead, the focus is on providing empirical evidence regarding the impact of a single climate policy-relevant event on a variety of green and brown portfolios constructed using different methodologies. By examining how these portfolios respond to such an event, the study aims to shed light on the financial implications of climate policy changes and the resilience of sustainability-focused investment strategies.

[10] See also Fatica et al. (2021) for a related discussion.

4.2. Robustness and additional tests

The correction for market returns is typically sufficient for short-horizon event studies, which applies to our case. For this reason, it is the most widely employed benchmark model, and we adopt it as the foundation of our main analysis. However, even over short horizons – and especially over longer ones – several well-documented deviations from the CAPM can arise, such as the size effect, the book-to-market effect, and the momentum effect. For instance, in long-horizon event studies, the Fama–French three-factor model (FF-3F) is frequently used as a benchmark to estimate NRs. This model extends the traditional market model by incorporating two additional factors: the return on a "size" portfolio (SMB) and the return on a "value" portfolio (HML), capturing systematic risks beyond market exposure. Following the same rationale and aiming for even more precise AR estimates, we also employ the Fama–French five-factor model (FF-5F). This model builds upon the FF-3F model by further accounting for financial performance – measured as the return difference between firms with high and low operating profitability (RMW) – and investment patterns, reflected in the return difference between firms that invest conservatively versus aggressively (CMA).

Finally, given our sectoral focus on green versus brown companies, other external factors, such as oil price, could play a crucial role in shaping return dynamics. To account for this, we augment the CAPM, FF-3F, and FF-5F models by incorporating oil price movements as an additional explanatory variable. All CARs estimated using these extended benchmark models are reported in Appendix B and discussed in detail below.

CAPM and oil price. As an initial robustness check, we examine whether oil price dynamics during the study period may have influenced the estimation of theoretical/expected returns and, consequently, the CARs surrounding Trump's election. To this end, we incorporate oil price fluctuations into our analysis and present the newly estimated CARs in Fig. B.1. Our findings reveal that the CARs for both green and brown portfolios remain largely consistent with those derived using the standard CAPM framework for estimating theoretical returns. This suggests that the inclusion of oil price dynamics does not significantly alter the overall pattern of ARs observed during the event window (compare Fig. 4 and Fig. B.1). This robustness check underscores the stability of our results and reinforces the conclusion that the observed market reactions are primarily driven by the political event itself rather than concurrent fluctuations in oil price. The consistency in CARs across both models highlights the resilience of our findings to alternative specifications and provides greater confidence in the validity of our initial results. Moreover, this analysis highlights the importance of considering external factors, such as commodity price movements, when evaluating the impact of political events on financial markets. While oil price is a critical variable for energy-intensive industries, their influence in this context appears to be secondary to the broader market sentiment and policy expectations triggered by Trump's election.

FF-3F. Most of the existing empirical literature employing event studies computes CARs using the standard CAPM, thereby ignoring other factors that could significantly affect return predictability. To address this limitation, we re-estimate CARs using the FF-3F model, which enhances asset pricing accuracy by accounting for systematic size and value effects beyond market risk. The estimated CARs are presented in Fig. B.2.

When ESG-related metrics are utilized, we continue to observe that brown portfolios benefit more than green portfolios from Trump's election. However, in contrast to the patterns documented in Fig. 4, the CARs for both brown and green portfolios exhibit a declining trend from approximately ten days prior to the election up until election day. A positive rebound is observed across all portfolios on the day following the election. Subsequently, and up to five days after the event, the CARs of green portfolios decline, whereas those of brown portfolios stabilize. A positive trend in CARs for both brown and green portfolios emerges only from five days after the election onward, with the upward trend being more pronounced for brown portfolios, as shown by the brown lines in Fig. B.2, Panels (a) to (c). This ultimately results in negative or near-zero CARs at the end of the event window, ranging between -5% and -3% for green portfolios and between -1.5% and 0% for brown portfolios.

Overall, these findings suggest that – despite CARs being, on average, negative, indicating adverse ARs around the event – the market reaction still favors brown portfolios over green ones following Trump's election. Investors likely anticipate more lenient environmental regulations and a less supportive policy environment for ESG-focused firms under Trump's administration. However, the differences in CARs observed when incorporating the SMB (size) and HML (value) factors suggest that firm size and value characteristics also influenced market reactions around the event date.[11]

As noted in our main analysis, using the CO_2 emission intensity metric reverses the CAR patterns between green and brown portfolios. Specifically, when green and brown portfolios are classified according to either the CO_2-to-revenues ratio or the CO_2-to-employees ratio, green portfolios outperform brown portfolios on average over the event window. By the end of the event window, CARs of green portfolios exceed those of brown portfolios, as shown in Fig. B.2, Panels (d) and (e).

For portfolios constructed based on emission intensity indicators, we still observe an increase in CARs immediately following the election. However, unlike the patterns seen in Fig. B.2, Panels (a) to (c), CARs of brown portfolios decline up to five days after the event, whereas CARs of green portfolios remain stable or begin increasing from two days after the election. From five days after the election through the end of the event window, the CARs of all portfolios display an upward trend. This increase is more pronounced for the brown portfolios, as illustrated by the brown lines in Fig. B.2, Panels (d) and (e). Nevertheless, by the end of the event window, low-emission portfolios exhibit slightly higher CARs than high-emission portfolios.

The CAR dynamics estimated for CPRS and non-CPRS portfolios are relatively similar, as shown by the blue line and the orange lines in Fig. B.2, Panel (f), reinforcing the notion that this classification criterion does not effectively distinguish between green and brown firms. Notably, the overall trends observed are not substantially different from those documented in Fig. B.2, Panels (a) to (c).

[11] See also Wagner et al. (2018) on this point.

FF-3F and oil price. In line with our approach for the market model, we integrate oil price as an additional factor into the FF-3F model to assess its impact on CARs. When comparing the resulting CARs dynamics to those presented in Fig. B.2, we observe that the overall patterns remain largely consistent across most portfolios. However, the primary distinction lies in the different magnitude of the CARs, that becomes apparent by comparing Figs. B.2 and B.3. Notably, for portfolios classified using the ESG-related metrics, the distinct positive benefits previously observed in brown portfolios following the 2024 U.S. Presidential election (post-Trump) are no longer evident. For instance, portfolios built upon the bottom 10% ESG Score and ESC Combined Score as well as the one based on the bottom 30% EP Score now exhibit CARs at the end of the event window that align more closely with those of green portfolios. This shift suggests that the inclusion of oil price mitigates some of the initial divergence in performance between green and brown portfolios observed under the FF-3F model. Crucially, across all classification criteria, both brown and green portfolios no longer display negative CARs by the end of the event window. This indicates that the incorporation of oil price, alongside other factors, has likely influenced market dynamics, leading to a more uniform response across portfolios by the end of the event period.

These findings highlight the nuanced role of oil price in shaping investor behavior and market outcomes, particularly in the context of political events with significant implications for energy and environmental policies. The convergence of CARs across green and brown portfolios underscores the importance of considering external factors, such as commodity price movements, when analyzing market reactions to political developments. In summary, this robustness check not only reinforces the sensitivity of our results to model specifications but also provides deeper insights into the interplay between oil price, investor sentiment, and sustainability-related market dynamics. By demonstrating how the inclusion of oil price alters the magnitude and patterns of CARs, we contribute to a more comprehensive understanding of the factors driving market responses to pivotal political events.

FF-5F. The CARs of the newly constructed green and brown portfolios, estimated using the FF-5F model, are shown in Fig. B.4. Overall, the inclusion of the profitability and investment factors does not materially affect the CAR dynamics relative to those obtained under the FF-3F model (see Figs. B.2 and B.4).

FF-5F and oil price. A similar pattern emerges when we extend the FF-5F model by incorporating oil price dynamics. The CAR dynamics for the green and brown portfolios, shown in Fig. B.5, are nearly indistinguishable from those reported in Fig. B.4. Overall, we observe that, across all benchmark model specifications, the inclusion of oil price dynamics does not have a significant impact on the estimated CARs.

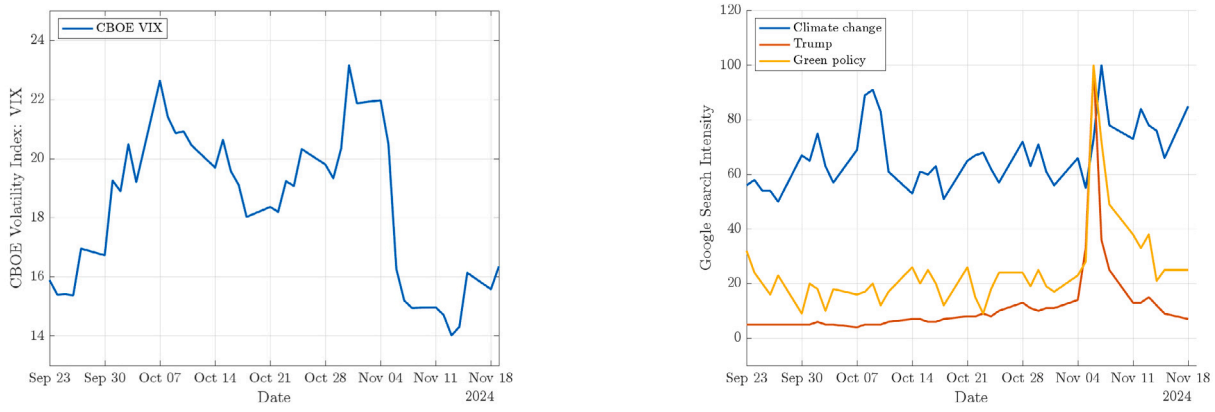
Additional classification criteria. As an additional robustness check, we extend the analysis by considering six further classification criteria. Specifically, we distinguish between two groups of measures. The first group includes three scores, closely related to ESG-based ones, designed to capture a firm's overall behavior in terms of environmental practices. Specifically, we use (i) the Refinitiv Resource Use Score, reflecting the capacity to reduce the use of materials, energy or water, and to find more eco-efficient solutions by improving supply chain management; (ii) the Refinitiv Emission Category Score, measuring the commitment and effectiveness towards reducing environmental emission in the production and operational processes; and (iii) the Refinitiv Environmental Innovation Category Score, reflecting the capacity to reduce the environmental costs and burdens for its customers, and creating new market opportunities through new environmental technologies and processes or eco-designed products. The second group consists of three intensity-based measures, constructed as (i) total waste generated; (ii) total energy used; and (iii) total water used to revenues ratio. These indicators are conceptually closer to carbon intensity measures, as they reflect specific realized environmental pressures rather than firms' broader environmental orientation or forward-looking commitments.[12]

CARs resulting from the use of these additional criteria are shown in Appendix C in Fig. C.1. Turning to portfolios constructed on the basis of the additional ESG-related scores, the results are consistent with the main findings. Specifically, portfolios classified according to these measures exhibit a clear pattern in which brown portfolios outperform green ones following the election outcome. By contrast, when intensity-based measures are used, green portfolios again outperform brown portfolios on average over the event window. However, the CARs of both green and brown portfolios decline until five days after the election and remain negative throughout the post-event window, as shown in Fig. C.1, Panels (d) to (f). Overall, these additional tests reinforce the view that broader, score-based environmental indicators incorporate forward-looking information that is more relevant for investors' responses to political shocks, whereas backward-looking intensity measures appear less informative for capturing market expectations about firms' exposure to future environmental and regulatory policies.

4.3. Explaining Trump's election abnormal returns

In this final empirical analysis, we aim to establish a comprehensive framework for examining the factors that may have influenced ARs of green and brown portfolios around Trump's 2024 election. Drawing inspiration from the methodology of Ramelli et al. (2021a), we hypothesize that uncertainty surrounding the U.S. 2024 Presidential election and green policies may have played a crucial role in shaping these price deviations. To capture this uncertainty, we follow recent literature that utilizes Google search volume as a proxy for public sentiment or uncertainty (see, among others, Bontempi et al., 2021; Castelnuovo & Tran, 2017; Donadelli, 2015; Pratap & Priyaranjan, 2023). Specifically, we retrieve Google Trends data for terms closely tied to the election and climate policy, i.e., "climate change" and "Trump". These search trends serve as indicators of public attention and uncertainty about

[12] These data has also been retrieved from the LSGE workspace, see: https://www.lseg.com/. Corresponding field codes are the following: `TR.TRESGResourceUseScore`, `TR.TRESGEmissionsScore`, `TR.TRESGInnovationScore`, `TR.AnalyticTotalWaste`, `TR.AnalyticEnergyUse` and `TR.AnalyticWaterUse`.



(a) CBOE Volatility Index (VIX). (b) Google Trends.

Fig. 6. Independent variables used to explain the dynamics of CARs.
Notes: This figure shows the behavior of the variables used as independent variables to explain the dynamics of CARs, over the regression time frame, i.e., the CBOE Volatility Index (VIX) (left panel) and Google Trends "climate change", "Trump" and "green policy", measured in terms of relative search interest, normalized over [0,100] (right panel).

the election outcome and its potential implications for environmental policy. We further conjecture that a contrarian movement – favoring Kamala Harris and her pro-green policies – could have emerged in response to Donald Trump's pro-fossil fuel stance. This shift in sentiment may have galvanized interest in the green transition and the implementation of green policies, potentially influencing both green and brown portfolio returns during the election period. To quantify this "green sentiment", we use the daily frequency of Google searches for the term "green policy" as a proxy. In addition to these Google-based measures, we incorporate a broader indicator of equity market uncertainty – the CBOE Volatility Index (VIX) – to account for general market fear and instability. Together, these four variables serve as potential drivers of ARs in our analysis.

We note that CARs are used as the dependent variable in our regression analysis. This choice is consistent with the event study literature (Ramelli et al., 2021b; Wagner et al., 2018) and is motivated by the fact that CARs provide a synthetic measure of the overall market reaction to the election shock. Using daily ARs would instead shift the focus toward transitory, day-by-day fluctuations and would be more sensitive to event-induced volatility. The evolution of the potential drivers of the estimated CARs are illustrated in Fig. 6. Interestingly, we observe a significant decline in equity market volatility around the election date, contrasting with the relatively high levels of volatility in the month preceding the election. This pattern suggests that market uncertainty peaked in the lead-up to the event and subsided once the election outcome was known, reflecting a resolution of pre-election uncertainty. Around the event date, as expected, we document a substantial surge in the volume of Google searches for all relevant terms. This spike in search activity highlights the heightened public interest and engagement with the election and its associated themes during this critical period. Notably, there is considerable variation in the level of attention devoted to specific topics such as "climate change" and "green policy". This divergence in public interest may reflect differing priorities among stakeholders or the varying salience of these issues during the election cycle. Such variations could have important implications for understanding how market participants and the broader public perceive and respond to policy-related developments. Although Fig. 6 may visually suggest that some regressors co-move, a strong correlation is observed only between "Trump" and "green policy" Google Trends.[13] Although this raises a potential multicollinearity concern, including both regressors is justified because each captures a distinct information channel. Google searches for "Trump" proxy attention to the anticipated political direction, whereas "green policy" reflects public interest in environmental issues and regulatory expectations. Event studies, such as Ramelli et al. (2021a), commonly include correlated sentiment proxies when they represent non-substitutable sources of information. Excluding either "Trump" or "green policy" would mechanically reduce multicollinearity but at the cost of introducing omitted-variable bias, since these variables reflect different dimensions of the information environment surrounding the election.

[13] The correlation matrix of the four regressors (in the following order: "climate change", "Trump", "green policy", and "VIX") over the period from September 23rd, to November 19th, 2024, is:

$$R = \begin{bmatrix} 1.0000 & 0.2137 & 0.3537 & -0.1760 \\ 0.2137 & 1.0000 & 0.8825 & -0.2071 \\ 0.3537 & 0.8825 & 1.0000 & -0.4233 \\ -0.1760 & -0.2071 & -0.4233 & 1.0000 \end{bmatrix}.$$

Table 2
The determinants of CARs: top 10% ESG Score vs. bottom 10% ESG Score portfolios.

	Model specification									
	(1)	(2)	(3)	(4)	(5)	(1)	(2)	(3)	(4)	(5)
	Top 10% ESG Score (G)					*Bottom 10% ESG Score (B)*				
(c)	−0.0820**	0.0351	−0.0151***	−0.0131	−0.0116	0.0207	0.0111	0.0172***	−0.0045	−0.0130
	(0.0203)	(0.0152)	(0.0035)	(0.0243)	(0.0271)	(0.0177)	(0.0142)	(0.0027)	(0.0225)	(0.0249)
β_{VIX}	0.0033*			0.0022	0.0021	0.0001			0.0009	0.0013
	(0.0011)			(0.0010)	(0.0011)	(0.0010)			(0.0009)	(0.0010)
β_{CC}		−0.0008**		−0.0007**	−0.0007**		0.0002		0.0001	0.0000
		(0.0002)		(0.0002)	(0.0002)		(0.0002)		(0.0002)	(0.0002)
β_T			−0.0005**	−0.0003	−0.0002			0.0005**	0.0005**	0.0002
			(0.0002)	(0.0002)	(0.0004)			(0.0001)	(0.0001)	(0.0003)
β_{GP}					0.0000					0.0003
					(0.0004)					(0.0004)
R^2	0.1856	0.2612	0.1445	0.4201	0.4204	0.0004	0.0168	0.2141	0.2368	0.2505

Notes: This table presents the estimation results of Eq. (5) for the Cumulative Abnormal Returns (CARs) associated with the top 10% (left panel) and bottom 10% (right panel) portfolios based on *ESG Score*. The analysis spans the period from September 23rd, to November 19th, 2024, encompassing 30 trading days prior to and 10 trading days following the event date. The explanatory variables included in the regression are as follows: the CBOE Volatility Index (VIX), which serves as a measure of market volatility, and the Google Search Volume Index (GSVI) for three distinct search terms: "climate change" (CC), "Trump" (T), and "green policy" (GP). These GSVI variables are employed to capture public attention and sentiment trends related to climate change, political developments, and environmental policy during the examined timeframe. HAC (Newey–West) robust standard errors are reported in parentheses. ***, **, and * indicate that the parameter estimate is significantly different from zero at the 1%, 5%, and 10% level, respectively.

To capture the potential effect of the aforementioned variables on detected CARs, we estimate the following specification of the model in Eq. (4) using daily CARs over the period from September 23rd, to November 19th, 2024:

$$CAR_{i,t} = \alpha_i + \beta_{VIX} VIX_t + \beta_{CC} CC_t + \beta_T T_t + \beta_{GP} GP_t + \varepsilon_{i,t}. \tag{5}$$

Here, $i = G, B$ denotes the green (G) and brown (B) portfolios, respectively, and $t \in [t_0 - 30, t_0 + 10]$ represents a 40-trading-day window around Trump's 2024 election win.[14] The term α_i denotes the portfolio-specific intercept, while VIX_t is the CBOE Volatility Index (VIX), a widely used measure of market-wide fear and uncertainty. The variables CC_t, T_t, and GP_t correspond to Google Trends data capturing search interest in the terms "climate change", "Trump", and "green policy", respectively.[15] Finally, $\varepsilon_{i,t}$ represents the usual error term.

The estimation of Eq. (5) must be carried out with proper caution in light of the potential risks of autocorrelation and heteroskedasticity. Even though the model is estimated over a very short time window, i.e., 41 days, CARs are cumulative series, so adjacent observations mechanically display serial correlation, and their variance typically increases over time. To address these issues, all estimation results for both G and B portfolios reported in Tables 2 to 7 are obtained using heteroskedasticity- and autocorrelation-consistent (HAC/Newey–West) standard errors.[16] These tables provide a comprehensive summary of the findings across different portfolio classification criteria and model specifications. They offer an in-depth analysis of the factors driving ARs for G and B assets during the period surrounding the 2024 U.S. Presidential election.

Top ESG score, ESG combined score and EP score portfolios (G). When constructing G portfolios based on ESG-related metrics, from the left panels of Tables 2 to 4 we observe that aggregate market volatility has exerted a positive influence on CARs. This result is robust across all model specifications, indicating that days of heightened market uncertainty during the study timeframe may have disproportionately favored environmentally conscious investments. One plausible explanation is that investors, during times of market instability, may have sought refuge in sustainable assets, perceiving them as more resilient or aligned with long-term value creation. However, the analysis reveals a contrasting effect when examining the impact of specific climate-related uncertainties. Rising attention to topics such as "climate change" and "Trump" (used as proxies for climate-related uncertainty) is associated with a significant and consistently negative impact on CARs. This suggests that increased public and media focus on these topics may have introduced additional uncertainty or risk perceptions, which adversely affected the performance of G portfolios. For instance, discussions around climate change policies or political developments under the Trump administration may have created regulatory or market uncertainty, leading investors to reassess the risk-return profile of environmentally focused investments. Interestingly, our proxy for green sentiment – a measure of public enthusiasm or positive sentiment toward environmentally friendly initiatives – is found to have no statistically significant effect on the CARs of top-ESG portfolios. This lack of significance implies that while

[14] To ensure the robustness of our findings, we conducted the same analysis using a slightly larger window. Although the results from this expanded window are not reported here, they are consistent with those presented in the main analysis, demonstrating minimal variation. This alignment reinforces the reliability and stability of our conclusions, suggesting that the observed outcomes are not sensitive to minor adjustments in the window size.

[15] For robustness, we also considered the searches "Donald Trump" and "Donald Trump election". The results and dynamics were very similar. Due to space constraints, they are not reported here but are available upon request.

[16] For robustness, we repeated the analysis using CARs based on top and bottom 30% for each criterion. The additional results are in line with those presented and are available upon request.

Table 3
The determinants of CARs: top 10% ESG Combined Score vs. bottom 10% ESG Combined Score portfolios.

	Model specification									
	(1)	(2)	(3)	(4)	(5)	(1)	(2)	(3)	(4)	(5)
	Top 10% ESG Combined Score (G)					*Bottom 10% ESG Combined Score (B)*				
(c)	−0.0659**	0.0289*	−0.0130***	−0.0104	−0.0092	0.0232	0.0120	0.0196***	−0.0058	−0.0132
	(0.0161)	(0.0121)	(0.0028)	(0.0196)	(0.0218)	(0.0196)	(0.0156)	(0.0030)	(0.0249)	(0.0276)
β_{VIX}	0.0026*			0.0018	0.0017	0.0001			0.0010	0.0014
	(0.0009)			(0.0008)	(0.0009)	(0.0011)			(0.0010)	(0.0012)
β_{CC}		−0.0007**		−0.0006**	−0.0006**		0.0002		0.0001	0.0000
		(0.0002)		(0.0002)	(0.0002)		(0.0002)		(0.0002)	(0.0002)
β_T			−0.0003**	−0.0002	−0.0001			0.0005**	0.0005**	0.0003
			(0.0001)	(0.0001)	(0.0003)			(0.0002)	(0.0002)	(0.0004)
β_{GP}					0.0000					0.0003
					(0.0003)					(0.0004)
R^2	0.1869	0.2754	0.1176	0.4172	0.4175	0.0005	0.0190	0.2109	0.2354	0.2438

Notes: This table presents the estimation results of Eq. (5) for the Cumulative Abnormal Returns (CARs) associated with the top 10% (left panel) and bottom 10% (right panel) portfolios based on *ESG Combined Score*. The analysis spans the period from September 23rd, to November 19th, 2024, encompassing 30 trading days prior to and 10 trading days following the event date. The explanatory variables included in the regression are as follows: the CBOE Volatility Index (VIX), which serves as a measure of market volatility, and the Google Search Volume Index (GSVI) for three distinct search terms: "climate change" (CC), "Trump" (T), and "green policy" (GP). These GSVI variables are employed to capture public attention and sentiment trends related to climate change, political developments, and environmental policy during the examined timeframe. HAC (Newey–West) robust standard errors are reported in parentheses. ***, **, and * indicate that the parameter estimate is significantly different from zero at the 1%, 5%, and 10% level, respectively.

market volatility and specific climate-related uncertainties play a measurable role in shaping returns, broader sentiment toward green initiatives may not directly translate into short-term financial performance for these portfolios. This finding underscores the complexity of investor behavior and the multifaceted nature of factors influencing ESG-driven investments.

Bottom ESG score, ESG combined score and EP score portfolios (B). Shifting our focus to the bottom ESG and EP score portfolios, from the right panels of Tables 2–4 we observe that the VIX continues to exert a positive influence on CARs. However, this effect is not statistically significant, suggesting that while market uncertainty may still play a role in shaping returns for assets associated to low ESG-related metrics, its impact is less pronounced or consistent compared to those with higher scores. This finding aligns with the notion that investors may perceive low-ESG assets as less sensitive to broader market fluctuations, possibly due to their weaker alignment with sustainability trends or long-term value drivers. Interestingly, increasing public interest in "climate change" does not significantly affect the CARs of these bottom-tier portfolios. This highlights a potential divergence in how environmental concerns influence high- versus low-ESG assets. Specifically, while heightened attention to climate-related issues may drive performance in high-ESG portfolios, low-ESG portfolios appear relatively insulated from such sentiment shifts. This could reflect the fact that companies with weaker environmental profiles are less directly impacted by climate-related risks or investor preferences for sustainable investments. In contrast, rising attention to "Trump" has a significant and positive impact on CARs for these portfolios. This suggests that certain policy developments or political dynamics under the Trump administration may have disproportionately benefited industries or companies with weaker ESG profiles. However, this positive effect disappears once attention to "green policy" is accounted for, as in model specification (5). This indicates that the observed impact of "Trump"-related searches is contingent on the absence of strong green policy sentiment. In other words, when green policy considerations come into focus, the previously positive influence of "Trump"-related attention diminishes, underscoring the complex interplay between political developments and environmental policy expectations in shaping investor behavior.

Bottom CO_2 portfolios (G). As shown in the left panels of Tables 5 and 6, the analysis reveals that neither the VIX nor the intensity of Google searches for "climate change" has a statistically significant impact on the CARs of portfolios with very low emission intensity. This finding suggests that neither market volatility nor public attention to climate change materially influences the financial performance of low-carbon portfolios. In contrast, increasing U.S. population interest in "Trump" is found to have a positive and statistically significant impact on the CARs of bottom CO_2 portfolios—those with the lowest carbon emissions, whether the metric is based on revenue or employees. Interestingly, this result stands in stark contrast to the observed effect on green portfolios based on broader ESG metrics or other environmental criteria. Specifically, rising attention to "Trump" appears to undermine the performance of ESG-based green portfolios while simultaneously enhancing the performance of CO_2-based green portfolios. This divergence highlights the nuanced and sometimes contradictory ways in which political sentiment can influence different categories of sustainable investments. Furthermore, variations in green sentiment, proxied by the frequency of Google searches for "green policy", were found to have no statistically significant impact on the financial performance of bottom CO_2 portfolios. The regression coefficient β_{GP} is not statistically significant, indicating that shifts in public interest toward green policies do not materially affect the returns of these portfolios. Notably, when green sentiment is included in the analysis, the previously significant effect of increased searches for "Trump" on portfolio performance vanishes. This suggests that the relationship between political attention and portfolio performance may be mediated by broader environmental sentiment.

In summary, these findings underscore the complexity of the relationship between market dynamics, public attention, and the financial performance of sustainable investments. While market volatility and climate change awareness appear to have limited

Table 4
The determinants of CARs: top 10% EP Score vs. bottom 10% EP Score portfolios.

	Model specification									
	(1)	(2)	(3)	(4)	(5)	(1)	(2)	(3)	(4)	(5)
	Top 10% EP Score (G)					*Bottom 10% EP Score (B)*				
(c)	−0.0593**	0.0302*	−0.0097**	−0.0046	−0.0011	0.0345	0.0015	0.0115**	0.0020	−0.0134
	(0.0153)	(0.0113)	(0.0026)	(0.0180)	(0.0201)	(0.0221)	(0.0178)	(0.0032)	(0.0272)	(0.0298)
β_{VIX}	0.0024			0.0016	0.0014	−0.0008			0.0002	0.0010
	(0.0008)			(0.0007)	(0.0008)	(0.0012)			(0.0011)	(0.0012)
β_{CC}		−0.0007**		−0.0005**	−0.0005**		0.0003		0.0001	0.0000
		(0.0002)		(0.0002)	(0.0002)		(0.0003)		(0.0002)	(0.0002)
β_{T}			−0.0004**	−0.0002	−0.0001			0.0007***	0.0007**	0.0002
			(0.0001)	(0.0001)	(0.0003)			(0.0002)	(0.0002)	(0.0004)
β_{GP}					−0.0001					0.0005
					(0.0003)					(0.0004)
R^2	0.1786	0.2872	0.1558	0.4432	0.4459	0.0113	0.0259	0.2961	0.2989	0.3270

Notes: This table presents the estimation results of Eq. (5) for the Cumulative Abnormal Returns (CARs) associated with the top 10% (left panel) and bottom 10% (right panel) portfolios based on *EP Score*. The analysis spans the period from September 23rd, to November 19th, 2024, encompassing 30 trading days prior to and 10 trading days following the event date. The explanatory variables included in the regression are as follows: the CBOE Volatility Index (VIX), which serves as a measure of market volatility, and the Google Search Volume Index (GSVI) for three distinct search terms: "climate change" (CC), "Trump" (T), and "green policy" (GP). These GSVI variables are employed to capture public attention and sentiment trends related to climate change, political developments, and environmental policy during the examined timeframe. HAC (Newey–West) robust standard errors are reported in parentheses. ***, **, and * indicate that the parameter estimate is significantly different from zero at the 1%, 5%, and 10% level, respectively.

Table 5
The determinants of CARs: bottom 10% CO_2-to-revenues ratio vs. top 10% CO_2-to-revenues ratio portfolios.

	Model specification									
	(1)	(2)	(3)	(4)	(5)	(1)	(2)	(3)	(4)	(5)
	Bottom 10% CO_2-to-revenues ratio (G)					*Top 10% CO_2-to-revenues ratio (B)*				
(c)	0.0089	0.0159*	0.0125***	0.0066	0.0092	−0.0099	0.0127	0.0076***	−0.010	−0.0035
	(0.0076)	(0.0060)	(0.0012)	(0.0103)	(0.0114)	(0.0084)	(0.0071)	(0.0015)	(0.0119)	(0.0131)
β_{VIX}	0.0003			0.0005	0.0004	0.0010			0.0011*	0.0008
	(0.0004)			(0.0004)	(0.0005)	(0.0005)			(0.0005)	(0.0005)
β_{CC}		0.0000		−0.0001	0.0000		−0.0001		0.0000	0.0000
		(0.0001)		(0.0001)	(0.0001)		(0.0001)		(0.0001)	(0.0001)
β_{T}			0.0001**	0.0001**	0.0002			0.0000	0.0001	0.0003**
			(0.0001)	(0.0001)	(0.0002)			(0.0001)	(0.0001)	(0.0002)
β_{GP}					−0.0001					−0.0002*
					(0.0002)					(0.0002)
R^2	0.0113	0.0036	0.0617	0.1104	0.1181	0.1051	0.0118	0.0021	0.1433	0.1750

Notes: This table presents the estimation results of Eq. (5) for the Cumulative Abnormal Returns (CARs) associated with the top 10% (left panel) and bottom 10% (right panel) portfolios based on *CO_2-to-revenues ratio*. The analysis spans the period from September 23rd, to November 19th, 2024, encompassing 30 trading days prior to and 10 trading days following the event date. The explanatory variables included in the regression are as follows: the CBOE Volatility Index (VIX), which serves as a measure of market volatility, and the Google Search Volume Index (GSVI) for three distinct search terms: "climate change" (CC), "Trump" (T), and "green policy" (GP). These GSVI variables are employed to capture public attention and sentiment trends related to climate change, political developments, and environmental policy during the examined timeframe. HAC (Newey–West) robust standard errors are reported in parentheses. ***, **, and * indicate that the parameter estimate is significantly different from zero at the 1%, 5%, and 10% level, respectively.

influence on low-carbon portfolios, political sentiment – particularly attention to "Trump" – exerts a significant but divergent impact depending on the specific sustainability metrics used. This highlights the importance of carefully considering the underlying criteria and context when evaluating the drivers of performance in green and sustainable investments.

Top CO_2 portfolios (B). As shown in the right panels of Tables 5 and 6, the analysis indicates that the CARs of top CO_2 portfolios – those with the highest carbon emissions – around the time of Trump's election were only weakly influenced by aggregate market volatility or other sentiment indicators. Among the variables examined, the VIX exhibits a positive and statistically significant impact on the CARs of portfolios in the top 10% of the CO_2-to-revenues ratio only in model specification (4), while "Trump" and "Green Policy" exert a slightly significant impact on CARs only in model specification (5). This finding suggests that broader market conditions, as captured by the VIX, and general sentiment shifts did not play a significant role in driving the performance of high-emission portfolios during the election period. Instead, the initial influence of market volatility appears to be overshadowed by green sentiment, highlighting the potential interplay between environmental concerns and financial markets. This underscores the limited impact of traditional market and sentiment measures on the performance of high-carbon portfolios during politically significant events like Trump's election.

CPRS vs. non-CPRS. The results of this empirical analysis, depicted in Table 7, demonstrate that proxies for heightened public attention to "Trump" exert comparable directional effects on the CARs of both CPRS and non-CPRS portfolios. However, the

Table 6
The determinants of CARs: bottom 10% CO_2-to-employees ratio vs. top 10% CO_2-to-employees ratio portfolios.

	Model specification									
	(1)	(2)	(3)	(4)	(5)	(1)	(2)	(3)	(4)	(5)
	Bottom 10% CO_2-to-employees ratio (G)					*Top 10% CO_2-to-employees ratio (B)*				
(c)	0.0741*	−0.0116	0.0208***	0.0176	0.0112	−0.0002	−0.0062	−0.0015	−0.0052	0.0041
	(0.0231)	(0.0181)	(0.0036)	(0.0285)	(0.0317)	(0.0121)	(0.0097)	(0.0020)	(0.0172)	(0.0188)
β_{VIX}	−0.0024			−0.0012	−0.0009	−0.0001			−0.0001	−0.0006
	(0.0012)			(0.0011)	(0.0013)	(0.0007)			(0.0007)	(0.0008)
β_{CC}		0.0006		0.0004	0.0003		0.0001		0.0001	0.0001
		(0.0003)		(0.0002)	(0.0003)		(0.0001)		(0.0001)	(0.0002)
β_T			0.0006**	0.0005**	0.0004			−0.0001	−0.0001	0.0002
			(0.0002)	(0.0002)	(0.0004)			(0.0001)	(0.0001)	(0.0003)
β_{GP}					0.0002					−0.0003*
					(0.0005)					(0.0003)
R^2	0.0871	0.1152	0.2462	0.3240	0.3284	0.0008	0.0035	0.0221	0.0312	0.0670

Notes: This table presents the estimation results of Eq. (5) for the Cumulative Abnormal Returns (CARs) associated with the top 10% (left panel) and bottom 10% (right panel) portfolios based on *CO_2-to-employees ratio*. The analysis spans the period from September 23rd, to November 19th, 2024, encompassing 30 trading days prior to and 10 trading days following the event date. The explanatory variables included in the regression are as follows: the CBOE Volatility Index (VIX), which serves as a measure of market volatility, and the Google Search Volume Index (GSVI) for three distinct search terms: "climate change" (CC), "Trump" (T), and "green policy" (GP). These GSVI variables are employed to capture public attention and sentiment trends related to climate change, political developments, and environmental policy during the examined timeframe. HAC (Newey–West) robust standard errors are reported in parentheses. ***, **, and * indicate that the parameter estimate is significantly different from zero at the 1%, 5%, and 10% level, respectively.

Table 7
The determinants of CARs: CPRS vs. non-CPRS portfolios.

	Model specification									
	(1)	(2)	(3)	(4)	(5)	(1)	(2)	(3)	(4)	(5)
	CPRS					*non-CPRS*				
(c)	−0.0009	0.0084	0.0020*	0.0030	0.0037	0.0146	0.0041	−0.0028	0.0190	0.0138
	(0.0058)	(0.0047)	(0.0010)	(0.0080)	(0.0090)	(0.0077)	(0.0065)	(0.0012)	(0.0099)	(0.0108)
β_{VIX}	0.0002			0.0003	0.0003	−0.0008			−0.0006	−0.0004
	(0.0003)			(0.0003)	(0.0004)	(0.0004)			(0.0004)	(0.0005)
β_{CC}		−0.0001		−0.0001	−0.0001		−0.0001		−0.0002	−0.0002
		(0.0001)		(0.0001)	(0.0001)		(0.0001)		(0.0001)	(0.0001)
β_T			0.0001**	0.0001***	0.0001			0.0002***	0.0002***	0.0001
			(0.0001)	(0.0001)	(0.0001)			(0.0001)	(0.0001)	(0.0001)
β_{GP}					0.0000					0.0002
					(0.0001)					(0.0002)
R^2	0.0117	0.0335	0.0613	0.1395	0.1401	0.0850	0.0119	0.2151	0.3102	0.3348

Notes: This table presents the estimation results of Eq. (5) for the Cumulative Abnormal Returns (CARs) associated with the *CPRS* (left panel) and *non-CPRS* (right panel) portfolios. The analysis spans the period from September 23rd, to November 19th, 2024, encompassing 30 trading days prior to and 10 trading days following the event date. The explanatory variables included in the regression are as follows: the CBOE Volatility Index (VIX), which serves as a measure of market volatility, and the Google Search Volume Index (GSVI) for three distinct search terms: "climate change" (CC), "Trump" (T), and "green policy" (GP). These GSVI variables are employed to capture public attention and sentiment trends related to climate change, political developments, and environmental policy during the examined timeframe. HAC (Newey–West) robust standard errors are reported in parentheses. ***, **, and * indicate that the parameter estimate is significantly different from zero at the 1%, 5%, and 10% level, respectively.

magnitude significance of this effect varies between the two groups. Specifically, the positive effect attributable to rising attention to "Trump" is attenuated in CPRS portfolio, suggesting that, being designed to incorporate carbon pricing risks, it exhibits greater resilience to fluctuations in public sentiment driven by climate-related concerns and political developments. Notably, the analysis finds no statistically significant relationship between green sentiment and the performance of either CPRS or non-CPRS portfolios. This implies that shifts in public interest toward green policies do not materially influence the returns of these portfolios. Furthermore, controlling for green sentiment in the regression models neutralizes the positive effect of rising attention to "Trump". This underscores the nuanced interplay between political sentiment and environmental factors in shaping portfolio performance.

The Green-minus-Brown portfolio. Finally, to further assess whether public-attention variables affect green and brown assets differently, we complement the previous analysis by examining the Green-Minus-Brown (GMB) portfolio. This approach is common in the related literature, as it allows to isolate relative effects by netting out shocks that are common to both green and brown portfolios (see, e.g., Pástor et al., 2022). The results of estimating Eq. (5) for the GMB portfolio are reported in Table 8. On the one hand, public attention to "Trump" exerts a statistically significant impact on CARs in almost all model specifications, with the exception of the number (5). Since the GMB portfolio, by construction, removes shocks common to both portfolios, this finding highlights a genuinely asymmetric effect. In particular, increased interest in "Trump" alters the relative performance of green and brown portfolios, reflecting heterogeneous exposure to the political shock. The estimated coefficient is most often negative,

Table 8
The determinants of CARs: Green-Minus-Brown (GMB) for the five classification criteria and CPRS minus non-CPRS portfolios.

	Model specification									
	(1)	(2)	(3)	(4)	(5)	(1)	(2)	(3)	(4)	(5)
	GMB ESG Score					*GMB ESG Combined Score*				
(c)	−0.1027	0.0240	−0.0323***	−0.0086	0.0014	−0.0891	0.0168	−0.0326***	−0.0046	0.0040
	(0.0357)	(0.0271)	(0.0055)	(0.0442)	(0.0492)	(0.0332)	(0.0253)	(0.0052)	(0.0417)	(0.0464)
β_{VIX}	0.0032			0.0013	0.0008	0.0025			0.0008	0.0003
	(0.0019)			(0.0017)	(0.0021)	(0.0018)			(0.0016)	(0.0019)
β_{CC}		−0.0010		−0.0007	−0.0007		−0.0009		−0.0007	−0.0006
		(0.0004)		(0.0004)	(0.0004)		(0.0004)		(0.0004)	(0.0004)
β_{T}			−0.0009**	−0.0008**	−0.0005			−0.0008**	−0.0007*	−0.0005
			(0.0003)	(0.0003)	(0.0007)			(0.0003)	(0.0003)	(0.0006)
β_{GP}					−0.0003					−0.0003
					(0.0007)					(0.0007)
R^2	0.0639	0.1391	0.2084	0.2981	0.3026	0.0459	0.1260	0.1996	0.2745	0.2784
	GMB EP Score					*GMB CO_2-to-revenues ratio*				
(c)	−0.0938	0.0287	−0.0211**	−0.0065	0.0123	0.0188*	0.0033	0.0049***	0.0165	0.0128
	(0.0349)	(0.0272)	(0.0053)	(0.0425)	(0.0469)	(0.0070)	(0.0059)	(0.0012)	(0.0102)	(0.0113)
β_{VIX}	0.0032			0.0014	0.0004	−0.0007			−0.0006	−0.0004
	(0.0019)			(0.0017)	(0.0020)	(0.0004)			(0.0004)	(0.0005)
β_{CC}		−0.0009		−0.0006	−0.0005		0.0000		0.0000	0.0000
		(0.0004)		(0.0004)	(0.0004)		(0.0001)		(0.0001)	(0.0001)
β_{T}			−0.0010**	−0.0009**	−0.0003			0.0001*	0.0001*	0.0000
			(0.0003)	(0.0003)	(0.0006)			(0.0001)	(0.0001)	(0.0002)
β_{GP}					−0.0006					0.0001
					(0.0007)					(0.0002)
R^2	0.0691	0.1205	0.2703	0.3404	0.3567	0.0791	0.0048	0.0389	0.0955	0.1110
	GMB CO_2-to-employees ratio					*CPRS minus non-CPRS*				
(c)	0.0742	−0.0054	0.0223***	0.0229	0.0071	−0.0155*	0.0043	0.0048***	−0.0160*	−0.0101
	(0.0283)	(0.0229)	(0.0045)	(0.0370)	(0.0408)	(0.0054)	(0.0051)	(0.0010)	(0.0076)	(0.0081)
β_{VIX}	−0.0023			−0.0011	−0.0003	0.0010**			0.0009*	0.0006
	(0.0015)			(0.0015)	(0.0017)	(0.0003)			(0.0003)	(0.0003)
β_{CC}		0.0005		0.0003	0.0002		0.0000		0.0001	0.0001
		(0.0003)		(0.0003)	(0.0003)		(0.0001)		(0.0001)	(0.0001)
β_{T}			0.0007**	0.0007**	0.0002			−0.0001**	−0.0001**	0.0001
			(0.0002)	(0.0002)	(0.0005)			(0.0001)	(0.0000)	(0.0001)
β_{GP}					0.0005					−0.0002***
					(0.0006)					(0.0001)
R^2	0.0545	0.0630	0.2145	0.2505	0.2677	0.2326	0.0010	0.1355	0.3164	0.3686

Notes: This table presents the estimation results of Eq. (5) for the difference between Cumulative Abnormal Returns (CARs) of green and brown portfolios, identify by the top/bottom 10% for each criterion, and of CPRS minus non-CPRS portfolio. The analysis spans the period from September 23rd, to November 19th, 2024, encompassing 30 trading days prior to and 10 trading days following the event date. The explanatory variables included in the regression are as follows: the CBOE Volatility Index (VIX), which serves as a measure of market volatility, and the Google Search Volume Index (GSVI) for three distinct search terms: ''climate change'' (CC), ''Trump'' (T), and ''green policy'' (GP). These GSVI variables are employed to capture public attention and sentiment trends related to climate change, political developments, and environmental policy during the examined timeframe. HAC (Newey–West) robust standard errors are reported in parentheses. ***, **, and * indicate that the parameter estimate is significantly different from zero at the 1%, 5%, and 10% level, respectively.

indicating a widening of the return gap in favor of brown portfolios, in line with the main results. On the other hand, attention to "climate change" and "green policy" generates weaker effects in the GMB regressions than in the separate green and brown portfolio analyses. This suggests that the impact of these attention measures is largely absorbed when constructing the difference portfolio, as they affect green and brown assets in a more symmetric manner.

5. Concluding remarks

This study examines the short-term stock price reactions of green and brown firms following Donald Trump's victory in the 2024 U.S. Presidential election. Using an event study methodology, we analyze CARs for portfolios constructed based on various environmental sustainability criteria, including ESG-related scores and CO_2 emission intensity measures. Our findings reveal that the classification criteria significantly influence market reactions, with brown portfolios (low ESG-related scores) generally outperforming green portfolios (high ESG-related scores) in the aftermath of the election. This suggests that investors anticipated a relaxation of environmental regulations under the Trump administration, favoring carbon-intensive industries. However, when portfolios are classified based on CO_2 emission intensity, green portfolios (low CO_2 emissions) outperform brown portfolios (high CO_2 emissions), indicating that investors may place greater emphasis on direct environmental impact metrics in the short term. Furthermore, this study underscores the importance of the factor model used to estimate theoretical returns. While different models produce CARs of varying magnitudes, the relative outperformance of brown portfolios – when constructed using ESG metrics – remains broadly consistent on average.

Our analysis further highlights the impact of market volatility, public attention to climate change, and political sentiment on stock price abnormal deviations. Notably, increased attention to "climate change" and "Trump" negatively affected the abnormal returns of green portfolio based upon ESG-related metrics around the Trump's election date, while searches for "green policy" – a proxy for green sentiment – had no significant influence

Overall, this research contributes to the growing literature on the financial implications of political events, particularly in the context of climate policy. It emphasizes the need for transparent and consistent environmental metrics to better understand market dynamics and investor responses to sustainability-related risks. The findings suggest that while political outcomes can significantly influence green and brown portfolio performance, the choice of classification criteria and factor models plays a crucial role in shaping these dynamics.

CRediT authorship contribution statement

Nicola Comincioli: Writing – original draft, Writing – review & editing, Software, Methodology, Investigation, Formal analysis, Data curation. **Michael Donadelli:** Writing – original draft, Writing – review & editing, Validation, Supervision, Methodology, Investigation, Conceptualization.

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Declaration of competing interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

Appendix A. Data: NACE decoding

See Table A.1.

Table A.1
Mapping of climate-policy-relevant sectors as from Battiston et al. (2017) to NACE Rev2 4-digit codes.

Sector	Battiston et al. (2017)	NACE Rev2 4-digit codes
Fossil-fuel	B5.1 to B6.2	05.10, 05.20, 06.10, 06.20
	B8.9.2	08.92
	B9.1	09.10
	C19.1	19.10
	C19.2	19.20
	C20.1.1	20.11
	C28.9.2	28.92
	D35.2	35.20
	F43.1.2	43.12
	F43.1.3	43.13
	H49.5	49.50
Energy-intensive	B7.1	07.10
	B7.2.9	07.29
	B8.9.1	08.91
	B8.9.3	08.93
	B8.9.9	08.99
	C10.2	10.20
	C10.6.2	10.62
	C10.8.1	10.81
	C19.8.6	19.86
	C11.0.1	11.01
	C11.0.2	11.02
	C11.0.4	11.04
	C11.0.6	11.06
	C13.1 to C15.2	13.10, 13.20, 13.30, 13.91, 13.92, 13.93, 13.94, 13.95, 13.96, 13.99, 14.11, 14.12, 14.13, 14.14, 14.19, 14.20, 14.30, 14.31, 14.39, 15.11, 15.12, 15.20
	C16.2.9 to C17.1.2	16.29, 17.11, 17.12
	C17.2.4	17.24
	C20.1.2 to C20.2	20.12, 20.13, 20.14, 20.15, 20.16, 20.17, 20.20
	C20.4.2	20.42
	C20.5.3 to C22.1.9	20.53, 20.59, 20.60, 21.10, 21.10, 21.20, 22.11, 22.19
	C23.1.1	23.11
	C23.1.3 to C23.5	23.13, 23.14, 23.19, 23.20, 23.31, 23.32, 23.41, 23.42, 23.43, 23.44, 23.49, 23.52
	C23.7	23.70
	C23.9.1	23.91
	C24.1	24.10
	C24.2	24.20
	C24.4	24.40
	C24.4.6	24.46
	C24.5.1	24.51
	C24.5.3	24.53
	C25.4	25.40
	C25.7	25.70
	C25.9.4 to C28.9.1	25.94, 25.99, 26.10, 26.11, 26.12, 26.20, 26.20, 26.30, 26.40, 26.51, 26.52, 26.60, 26.70, 26.80, 27.11, 27.12, 27.20, 27.31, 27.32, 27.33, 27.40, 27.51, 27.52, 27.90, 28.11, 28.12, 28.13, 28.14, 28.15, 28.21, 28.22, 28.23, 28.24, 28.25, 28.29, 28.30, 28.41, 28.49, 28.91
	C28.9.3 to C29.1	28.93, 28.94, 28.95, 28.96, 28.99, 29.10
	C29.3.1	29.31
	C30.3	30.30
	C30.9	30.90
	C31.0.9 to C32.9	31.09, 32.11, 32.12, 32.13, 32.20, 32.30, 32.40, 32.50, 32.91, 32.99

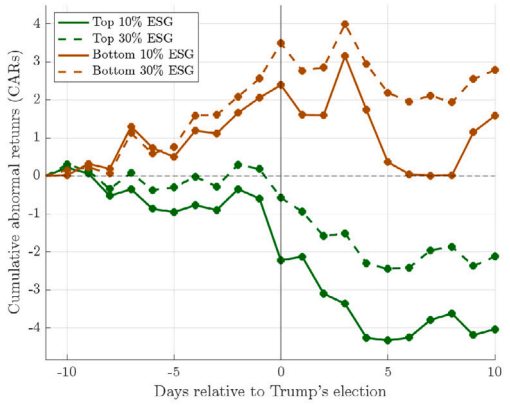
(*continued on next page*)

Table A.1 (*continued*).

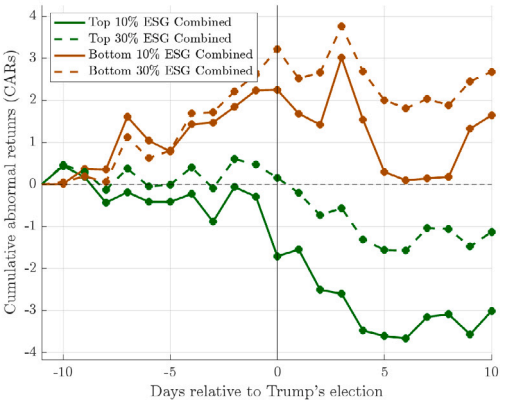
Sector	Battiston et al. (2017)	NACE Rev2 4-digit codes
Housing	C23.6.1	23.61
	C23.6.2	23.62
	C31.0.1	31.01
	C31.0.2	31.02
	C31.0.3	31.03
	F41.1	41.10
	F41.2	41.20
	F43.1	43.10
	F43.2	43.20
	F43.3	43.30
	F43.4	43.40
	F43.5	43.50
	F43.6	43.60
	F43.7	43.70
	F43.8	43.80
	F43.9	43.90
	I55.1	55.10
	L68	68.00
Utilities	D35.1	35.10
	F42.2.2	42.22
Transport	H49.1	49.10
	H49.2	49.20
	H49.3	49.31
	H49.4	49.41
	H50 to H51.2.1	50.10, 50.20, 50.30, 50.40, 51.10, 51.21
	H52.5	53.10
	H53.2.0	53.20
Finance	K	64.11, 64.19, 64.20, 64.30, 64.91, 64.92, 64.99, 65.10, 65.11, 65.12, 65.20, 65.30, 66.11, 66.12, 66.19, 66.21, 66.22, 66.29, 66.30

Appendix B. Robustness checks: Different factor models

See Figs. B.1–B.5.



(a) ESG Score.



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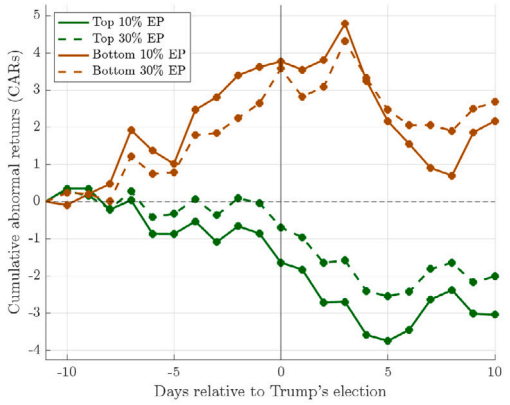
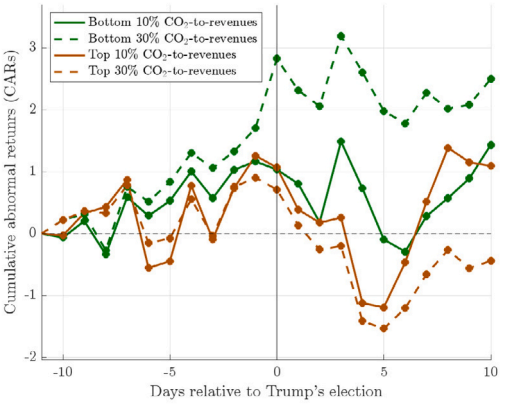
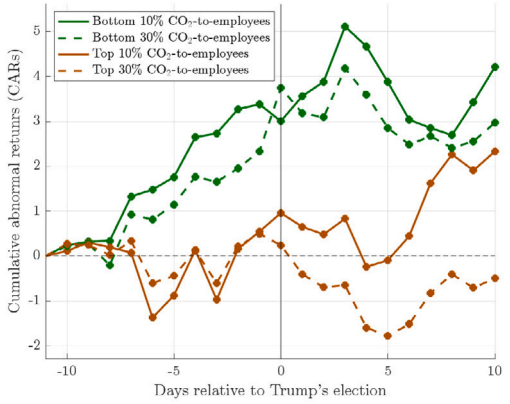


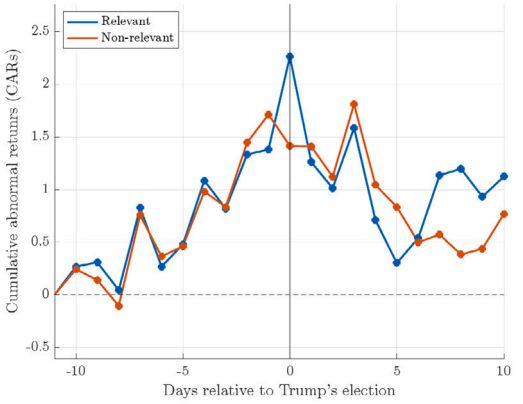
(c) EP Score.



(d) Estimated CO_2-to-revenues ratio.

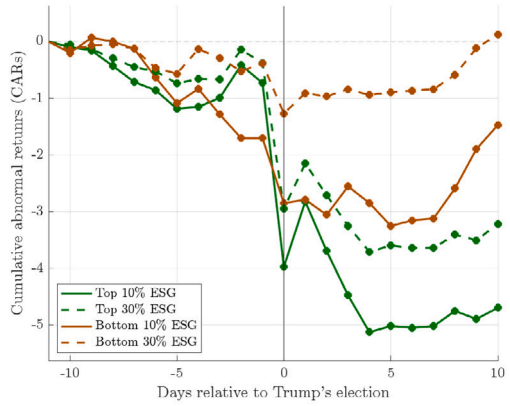


(e) Estimated CO_2-to-employees ratio.

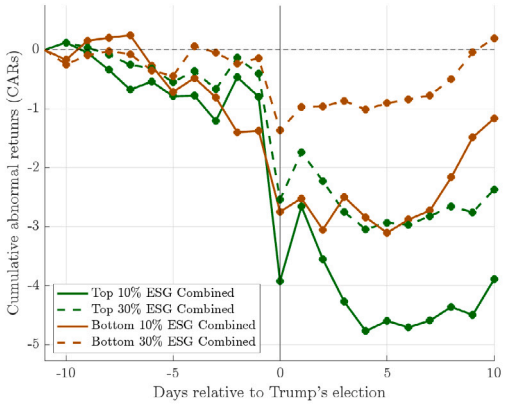


(f) Climate-policy-relevance.

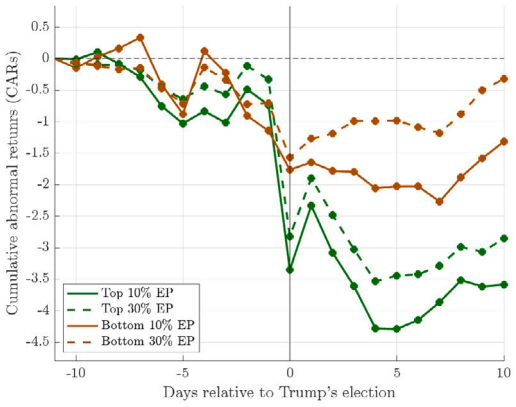
Fig. B.1. CARs around Trump's 2024 election day (CAPM and oil price).
Notes: CARs around the event date, based on predicted returns calculated using the CAPM, including the oil price change as an additional factor. Results are shown for different greenness criteria and percentiles from panel (a) to (e), as well as telling stocks on the basis climate-policy-relevance in panel (f).



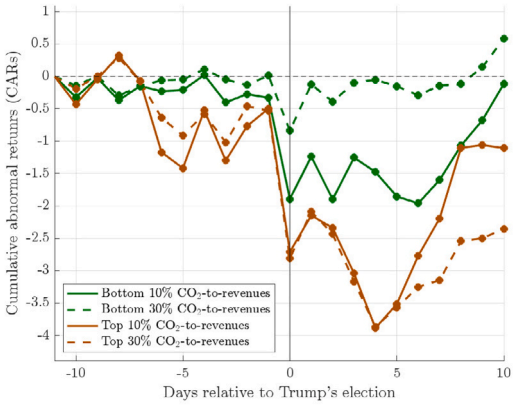
(a) ESG Score.



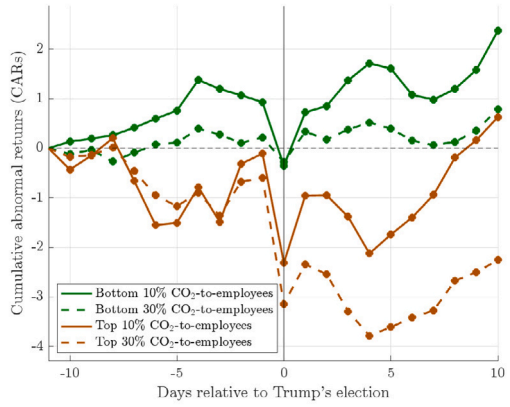
(b) ESG Combined Score.



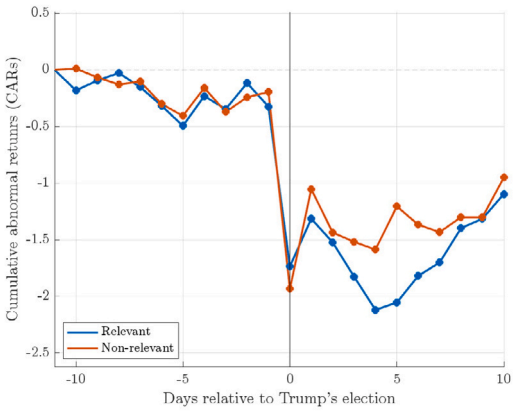
(c) EP Score.



(d) Estimated CO_2-to-revenues ratio.

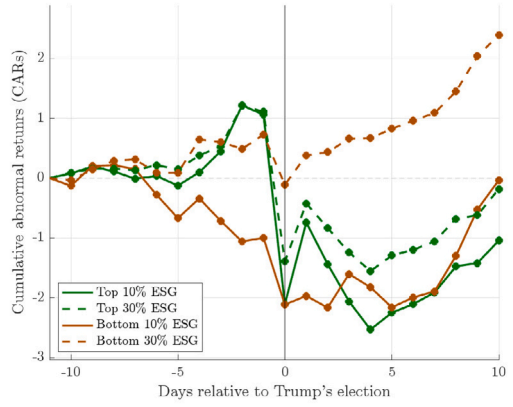


(e) Estimated CO_2-to-employees ratio.

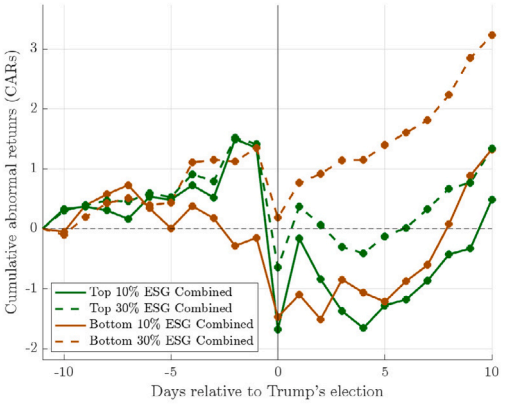


(f) Climate-policy-relevance.

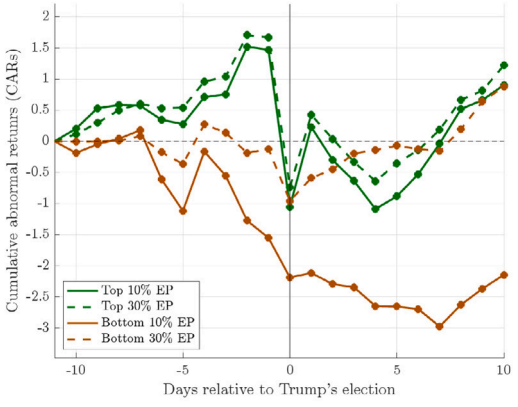
Fig. B.2. CARs around Trump's 2024 election day (FF-3F).
Notes: CARs around the event date, based on predicted returns calculated using the three-factor Fama–French model. Results are shown for different greenness criteria and percentiles from panel (a) to (e), as well as telling stocks on the basis climate-policy-relevance in panel (f).



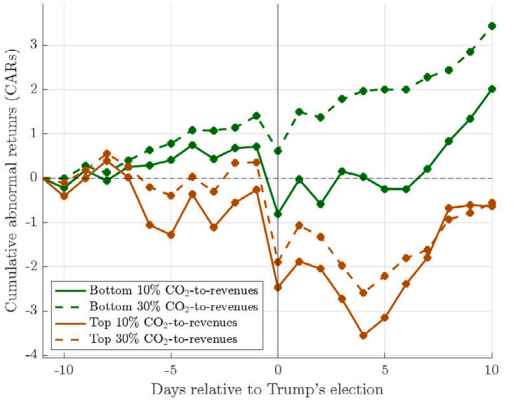
(a) ESG Score.



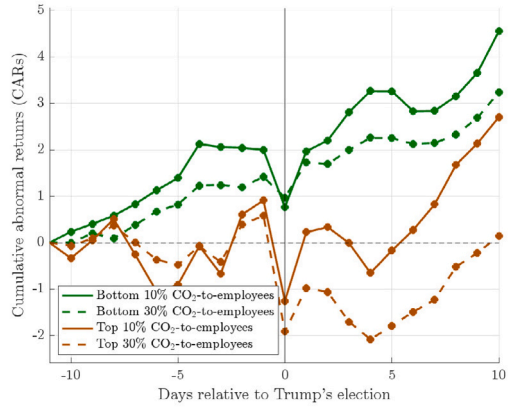
(b) ESG Combined Score.



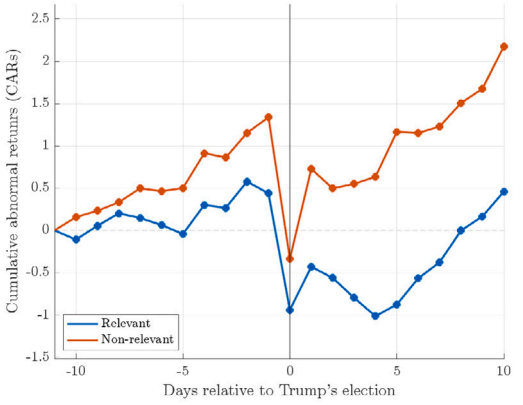
(c) EP Score.



(d) Estimated CO_2-to-revenues ratio.

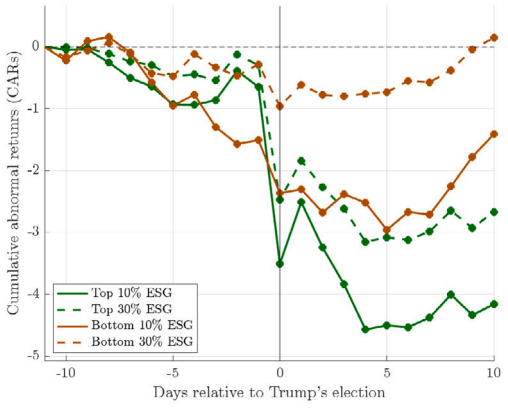


(e) Estimated CO_2-to-employees ratio.

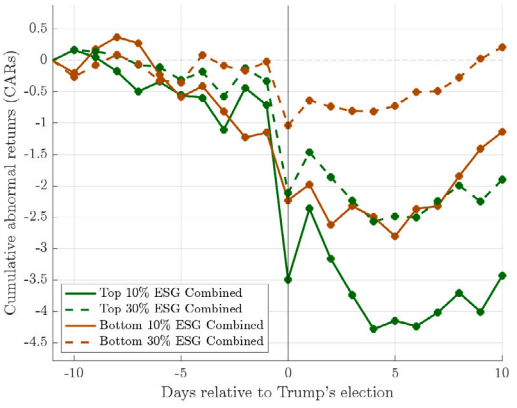


(f) Climate-policy-relevance.

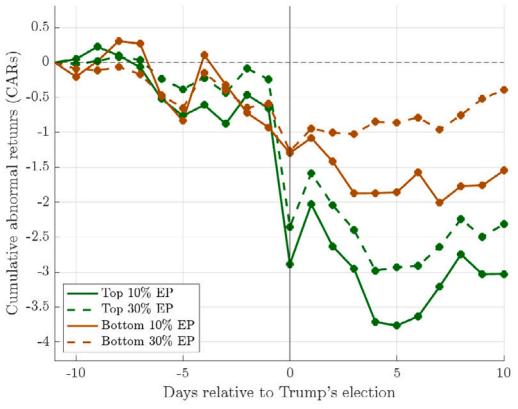
Fig. B.3. CARs around Trump's 2024 election day (FF-3F and oil price).
Notes: CARs around the event date, based on predicted returns calculated using the three-factor Fama–French model, including the oil price change as an additional factor. Results are shown for different greenness criteria and percentiles from panel (a) to (e), as well as telling stocks on the basis climate-policy-relevance in panel (f).



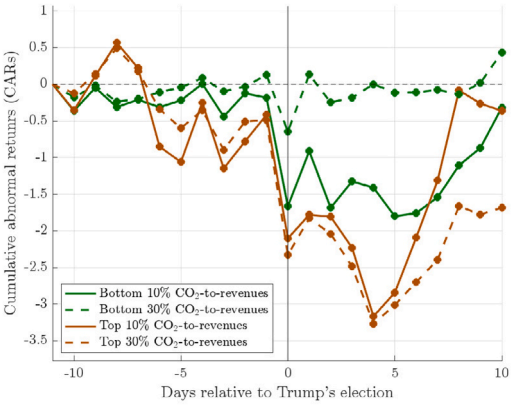
(a) ESG Score.



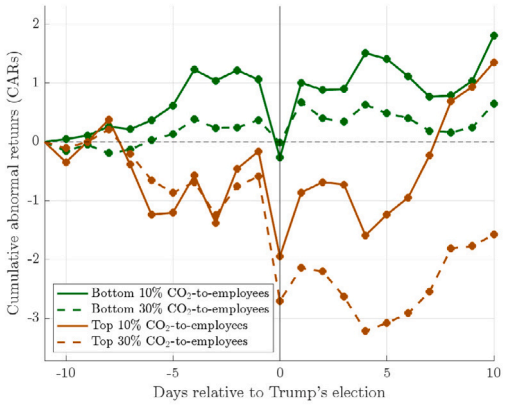
(b) ESG Combined Score.



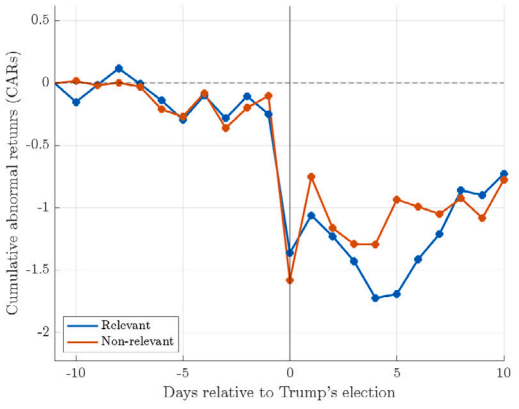
(c) EP Score.



(d) Estimated CO_2-to-revenues ratio.

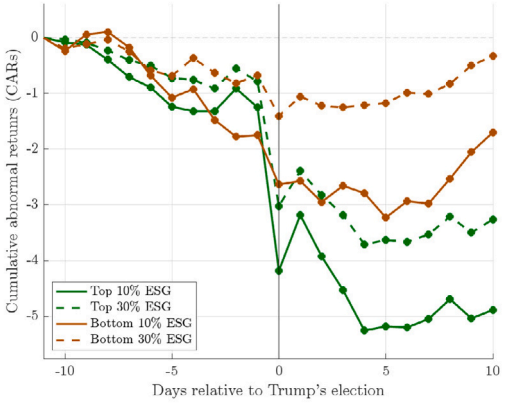


(e) Estimated CO_2-to-employees ratio.

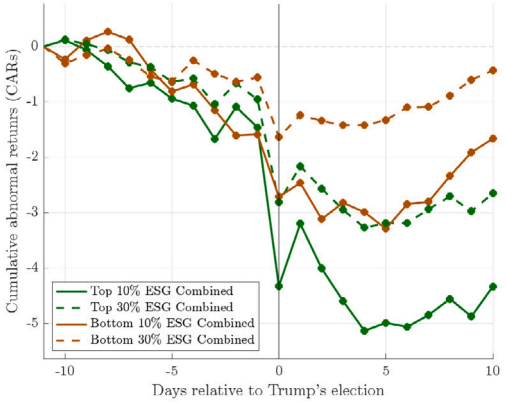


(f) Climate-policy-relevance.

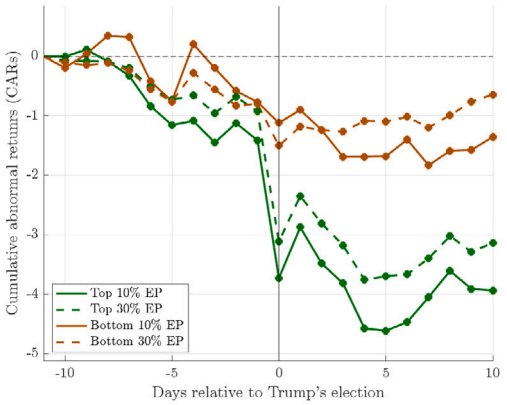
Fig. B.4. CARs around Trump's 2024 election day (FF-5F).
Notes: CARs around the event date, based on predicted returns calculated using the five-factor Fama–French model. Results are shown for different greenness criteria and percentiles from panel (a) to (e), as well as telling stocks on the basis climate-policy-relevance in panel (f).



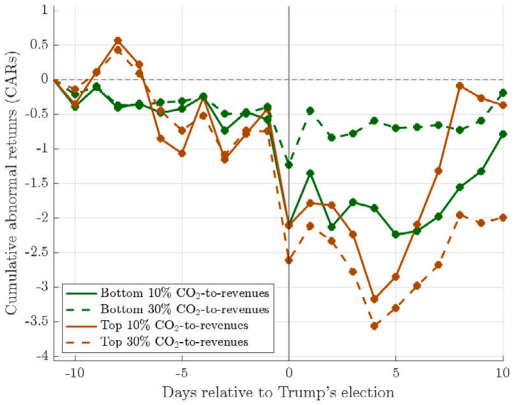
(a) ESG Score.



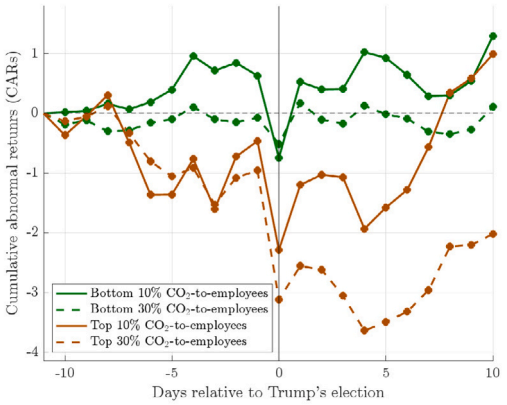
(b) ESG Combined Score.



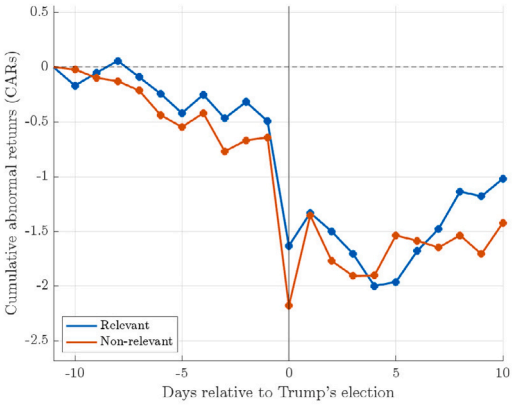
(c) EP Score.



(d) Estimated CO_2-to-revenues ratio.



(e) Estimated CO_2-to-employees ratio.



(f) Climate-policy-relevance.

Fig. B.5. CARs around Trump's 2024 election day (FF-5F and oil price).
Notes: CARs around the event date, based on predicted returns calculated using the five-factor Fama–French model, including the oil price change as an additional factor. Results are shown for different greenness criteria and percentiles from panel (a) to (e), as well as telling stocks on the basis climate-policy-relevance in panel (f).

Appendix C. Robustness check: Additional classification criteria

See Fig. C.1.

(a) Resource Use Score.

(b) Emissions Category Score.

(c) Environmental Innovation Score.

(d) Total energy-to-revenues ratio.

(e) Total waste-to-revenues ratio.

(f) Total water-to-revenues ratio.

Fig. C.1. CARs around Trump's 2024 election day (CAPM): green vs. brown portfolios based on additional classification criteria.
Notes: This figure illustrates the dynamics of CARs surrounding the U.S. Presidential election on November 5th, 2024. CARs are calculated following the methodology detailed in Section 3.1. The indicators used in this robustness check are available for a smaller set of firms than those employed in the main analysis. As a result, the corresponding portfolios are less diversified than those reported in Table 1. Below we report the number of stocks included in the green and brown portfolios for the top/bottom 10% and top/bottom 30% percentile thresholds: Panel (a): 86/257, Panel (b): 62/186, Panel (c): 87/262, Panel (d): 49/146, Panel (e): 63/190 and Panel (f): 57/171.

Data availability

Data will be made available on request.

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