Green Corporate Investments and Environmental Political Uncertainty*

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Abstract

Around the world, heightened *firm-level* environmental political uncertainty lowers green corporate investments, primarily by lowering green capital expenditures rather than R&D expenditures. However, this uncertainty does not reduce total investment; instead, firms reallocate funds from green to non-green investments. Shift-share IV regressions using the differential impact of climate disaster shocks suggest a causal relationship. Consistent with investment models under uncertainty, firms with low asset redeployability and high financial constraints exhibit stronger substitution effects. Cross-sectionally, these effects vary meaningfully with firms' carbon intensity, socially oriented institutional ownership, and climate change perceptions. Our findings highlight the critical role of environmental political uncertainty in shaping corporate investment and global sustainability efforts.

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1 Introduction

Environmental externalities pose significant risks to long-term sustainability (e.g., Gasparini and Tufano, 2023; Azar, Duro, Kadach, and Ormazabal, 2021; Cohen, Kadach, Ormazabal, and Reichelstein, 2023). Addressing these challenges requires substantial corporate investments in climate-mitigating projects (United Nations Global Compact, 2023), with estimates ranging from $3.5 trillion (McKinsey&Company, 2021) to $6 trillion (Goldman Sachs, 2021) in annual investments.[1] Despite corporate commitments and growing regulatory pressures, real investment in sustainability remains uneven. Only 16% of the world's largest firms are on track to meet net-zero targets (Accenture, 2024), highlighting widespread corporate hesitancy. In this paper, we argue that political uncertainty tied to individual firms plays a critical role in shaping corporate sustainability investments (SCI).

In particular, firms' uncertainty surrounding climate policy can act as a barrier rather than allowing climate policies to serve as a catalyst for SCIs. While the literature on investment under uncertainty suggests that heightened uncertainty generally reduces firm-level investment (e.g., Bernanke, 1983; Dixit and Pindyck, 1994; Bloom, Bond, and van Reenen, 2007), this effect is likely especially pronounced for environmental political uncertainty—the unpredictability of government policies on climate regulation, carbon pricing, subsidies, and disclosure mandates—which has increased post-Paris Agreement and is further amplified by political elections that shape climate agendas and regulatory priorities, eventually passing through unevenly to affect firms (Clark, 2024; Hassan, Hollander, van Lent, and Tahoun, 2019).[2]

Moreover, green investment projects are often capital-intensive, largely irreversible, and characterized by long time horizons, making them particularly vulnerable to political uncertainty.[3] As a result, if environmental

[1] Other reports also show that substantial corporate investments are required to achieve a net-zero carbon emission: a total of $50 trillion of investments in World Economic Forum (2022), $2.5 trillion from 2021 to 2030 for U.S. firms in Princeton University (2021), and between 0.5% and 4.5% of global GDP in International Monetary Fund (2021). About 12,000 firms worldwide have set net-zero targets S&P Global Sustainable Net-Zero Commitments Tracker.

[2] See the Wall Street Journal article, "The Regulatory State Is In Flux Like Never Before, and Businesses Are Hating It," published on September 3, 2024. The article discusses how the repeated reversal of environmental regulations across the Obama, Trump, and Biden administrations has created a "whiplash effect" for companies, causing hesitation in committing to long-term green investments. Further, see the Financial Times article, "Inside Trump's First Strikes at Biden's Climate Legacy," published on Jan. 30, 2025, which discusses how shifts in political leadership can lead to abrupt changes in environmental policies, such as President Trump's recent executive orders that reversed previous climate initiatives.

[3] Stable and predictable policy environments are widely considered essential for fostering private investment in sustainable projects (Fried, Novan, and Peterman, 2021; Nemet, Zipperer, and Kraus, 2017; ?). Anecdotal evidence further suggests that firms hesitate to commit to SCIs due to uncertainties surrounding government policies and carbon pricing (United Nations DESA, 2024; Reuters, 2025).

political uncertainty disproportionately discourages green investment, it could hinder progress toward corporate sustainability goals and climate transition efforts. Conversely, if firms strategically maintain SCIs despite related uncertainty, it would indicate a more resilient green investment landscape than traditional models predict. For example, reputational concerns and investor pressure may compel firms to sustain SCIs, sometimes as a defensive strategy rather than a long-term commitment, raising concerns about greenwashing (McDonnell and King, 2013; Lyon and Montgomery, 2015).

While these perspectives offer competing predictions, empirical evidence on how firms adjust SCIs in response to political uncertainty remains limited. In this paper, we examine the specific dynamics of sustainable corporate investments in politically uncertain environments, shedding light on whether uncertainty leads to the substitution, postponement, or persistence of SCIs in corporate strategy. As the global transition toward sustainability accelerates and government policies play an increasingly central role in shaping corporate sustainability efforts, understanding how firms respond to environmental political uncertainty is important to assessing the stability and effectiveness of green investment flows.

One of the main challenges for investors and regulators that are interested in sustainability is the identification of corporate investment activities that are deemed sustainable. To tackle this issue, we obtain novel data on SCI from Corporate Knights Inc. (CK), a B-Corp that collects data on sustainable investments from publicly disclosed data and direct engagement with companies.[4] The dataset includes 9,444 firm-year observations from 2019 through the end of 2022, representing 2,517 firms from 37 countries for which U.S. firms comprise one-third of the sample. The average sustainable investment ratio, defined as the ratio of green investments to total assets, is around 1.54%. These large SCIs reflect the growing recognition that long-term business success is increasingly tied to sustainability.[5] Backed by influential investors like BlackRock and bolstered by major policy initiatives such as the U.S. Inflation Reduction Act and the European Green Deal, firms are accelerating their commitment to SCIs. Total SCI reached $562 billion in 2022, and has trended upwards, marking a 52% increase from 2019. By integrating sustainability into their investment strategies, firms can internalize environmental externalities,

[4]CK's ratings serve as an input to identify potential investment candidates for investors representing $15 trillion in assets under management. CK Magazine focused on advancing a sustainable economy reaches 400,000 of the world's largest business and political decision-makers.

[5]These investment projects can take many forms in renewable energy, energy efficiency, waste reduction, sustainable agriculture, and responsible sourcing

capitalize on the rising demand for green products and services, and strengthen their resilience and competitive positioning. For example, in its 2019 annual report, Unilever states that it invested in renewable energy, energy efficiency, sustainable packaging, and sustainable agriculture committed to achieving net-zero emissions by 2030.[6]

In OLS analysis, we examine the relation between SCI and the firm-level environmental political risk index obtained from monitoring earnings conference calls by Hassan et al. (2019). Requiring earnings conference call data reduces the SCI sample to 4,570 firm-years, but focuses our analysis on the most relevant set of large firms around the world. In baseline regressions, we find that firms reduce their total SCI in times of elevated *environmental political risk*. We sharpen this interpretation in three ways: First, we include controls for political and non-political risk and sentiment to ensure that the association is unrelated to accompanying level and non-topical variance shocks. Second, we add controls for time-varying overall exposures to the climate (Sautner, van Lent, Vilkov, and Zhang, 2023) to isolate the environmental exposure emanating from political uncertainty. Third, following Gad, Nikolaev, Tahoun, and van Lent (2024), we also add the combination of firm fixed effects with a battery of other firm-level controls (e.g. firm size) that distinctly explain investment. Under this augmented specification, we observe robust main effects, and no effects on SCI for other types of political risk and between environmental political risk and non-SCI. These results reassuringly support our hypothesis that there is a tight link between SCI and its topically-related environmental political risk. Moreover, we find that this negative effect on total SCI exists only for green capital expenditures, consistent with theoretical studies finding uncertainty largely affects irreversible investments, and not multi-stage investments such as R&D where investment option value instead increases with uncertainty (Bernanke, 1983; Atanassov, Julio, and Leng, 2024).

Upon inspecting economic magnitudes, we find sizeable effects. A one standard deviation increase in environmental political risk is associated with a 0.105 percentage point drop in SCI relative to the firm's total assets. This is about a 9.7% drop relative to sample mean SCI, and in dollar terms about a $70.5 million cut in total SCI by an average firm. Upon decomposing this total into capital expenditures and R&D, sustainable capital expenditures comprise bulk of this drop. A similar back-of-envelope calculation yields a 0.07 percentage point drop in sustainable capital expenditures, representing a 8.4% effect relative to the sample mean, and $47.0 million dollar decrease.

[6]Appendix A.1 provides several examples of SCIs made by companies in our sample.

To address potential endogeneity in our baseline regression estimates, we adopt a novel instrumental variables (IV) strategy for causal identification. We construct a shift-share IV for firm-level environmental political risk by exploiting the *interaction* of two sources of variation: 1) pre-determined firm-level variation in environmental exposure (i.e., beta) to aggregate political risk (Hassan et al., 2019), and 2) time-series exogenous shocks induced by country climate disasters. Our design econometrically follows from Borusyak, Hull, and Jaravel (2022), who show that shift-share IV moment conditions are satisfied when share-weighted country-level shocks are exogeneous. This assumption, in our setting, has been extensively demonstrated by a long-line of literature (e.g., Cortés and Strahan, 2017; Correa, He, Herpfer, and Lel, 2023) on the unexpected financial market effects of natural disasters.

We further strengthen the causal interpretation of our shift-share IV design in the following ways. We include country×year fixed effects to, first, resolve the "incomplete shares" concern in Borusyak, Hull, and Jaravel (2022) that environmental political risk betas do not sum to one at the country-level, and second, absorb any unobserved indirect effect on environmental political risk from time-varying country-level factors (including by the disaster itself). Thus, identification solely follows from the differential impact of disaster shocks based on firms' environmental political risk betas, which alleviates potential confounding firm effects that are more related other aspects of the firm such as size or media attention. Second, our use of disaster shocks, rather than levels, accounts for any potential predictability or reverse causality in disasters. Indeed, in falsification tests, we find that our shift-share IV is a timely shock, with detected effects precisely in the year of the disaster shock, and not before or after. Third, consistent with our baseline regressions, we continue to control for overall political and non-political risk and sentiment to ensure that our IV is impacting investment solely through its effect on environmental political risk.

To test for IV relevance, we estimate first-stage regressions of environmental political risk on the shift-share IV, and find that they are strongly and positively correlated with $t = 2.54$. Upon decomposing disaster shocks into unexpectedly more or less severe ones, we sensibly find that the more severe shocks drive the first-stage relevance. In second-stage IV regressions, we find that instrumented environmental political risk results in lower total SCI that is almost all accounted for by cuts in capital expenditures. In contrast with our baseline regression results and standard findings in the investment under uncertainty literature, we additionally find that instrumented environmental political risk causes an *increase* in non-SCI. Notably, we find a striking similarity

in coefficient magnitudes despite the opposing signs on the IV coefficients for SCI and non-SCI, suggesting that overall investment is unaffected. Thus, environmental political risk not only impedes SCI, but also changes the *composition of firms' investment*.

We interpret our 2SLS evidence as supportive of an interesting substitution between SCI and non-SCI. To explore this hypothesis, we examine the extensive and intensive margins of the sensitivity of investment to environmental political risk. For the former, we find both IV and OLS regression detect insignificant effects on the likelihood of SCI by firms given differences in environmental political risk. For the latter and consistent with the fact that environmental political risk-driven substitution should only occur with pre-existing SCI, we find significant and sizeable decreases (increases) in sustainable (non-sustainable) CAPEX in the sub-sample of firms with non-zero total SCI. We corroborate this line of tests by repeating these tests in the zero SCI sample and examining other substitution outlets such as cash, R&D and mergers and acquisitions, and in both sets of tests, find no evidence of substitution. Overall, the results paint a consistent picture: substitution sensibly occurs only with pre-existing SCI, while environmental political risk does not impact the decision to make sustainable investments.

We next conduct a series of cross-sectional tests to assess the behavior of SCI under environmental political risk. We start by focusing on the risk aspect. Standard theories of investment under uncertainty highlight the dual roles of asset re-deployability (Kim and Kung, 2017) and financial constraints (Hennessy, Levy, and Whited, 2007). The former predicts assets that cannot be easily repurposed or liquidated during uncertain times reduces investment out of pre-cautionary motives. The predictions of the latter are, however, ambiguous: while standard theories predict uncertainty is more costly for financially constrained firms, Gilchrist, Sim, and Zakrajšek (2014) provide compelling evidence that the effect of uncertainty operates through the financial constraints channel. In cross-sectional sub-sample tests, we find supportive evidence for both roles: firms with less re-deployable assets and who are more unconstrained drive the documented substitution effect of SCI into non-SCI with higher environmental political risk. Combined, our firm-level results complement the findings of Kim and Kung (2017), who also document the concentrated effects of aggregate uncertainty for unconstrained firms, and more broadly support the Gilchrist, Sim, and Zakrajšek (2014) mechanism that only unconstrained firms have the "room" for environmental political risk to impact their investment via their credit spreads.

Our next line of cross-sectional tests examine the sustainability aspects of environmental political risk. We posit carbon-intensive firms are particularly sensitive to environmental political uncertainty due to their exposure to regulatory risks. We find that these firms are indeed the ones that cut SCI, redirecting capital toward non-SCIs, and thus are prioritizing core business activities over uncertain sustainability projects. Similarly, ESG-focused firm ownership may influence firms' responses to political uncertainty. While these investors advocate for sustainability, they may also prioritize financial stability during uncertain periods. We find that firms with significant Big 3 or UN-PRI ownership show stronger reductions in SCIs under environmental political risk. Thus, both carbon intensity and ESG investor importantly influence how firms navigate sustainability commitments amid political uncertainty.

Finally, we exploit cross-country variation to examine the impact of societal beliefs and political institutions on SCI investment behavior under uncertainty. Using survey data, we find that in countries with weak pro-environmental norms and less concern about climate change, firms face less public pressure and can reduce SCIs without reputational consequences, whereas firms in environmentally conscious societies are more likely to maintain their green investments. Similarly, political institutions play a key complementary role. When sorting firms by country-level political stability or corruption indices, we find that those in politically unstable or highly corrupt environments face higher risks of policy reversals and regulatory uncertainty, leading them to cut SCIs. Together, these results highlight the crucial role of societal norms and political stability in fostering long-term corporate sustainability investments.

Our findings build on and refine prior research in several ways. First, the literature on investment under uncertainty typically treats uncertainty as a uniform factor (e.g., Bloom, Bond, and van Reenen, 2007; Julio and Yook, 2012; Gulen and Ion, 2016), broadly dampening investment across all categories in a way consistent with real options theory and risk-aversion frameworks. In contrast, our study demonstrates that environmental political uncertainty exerts a *compositional effect* on corporate investment, rather than simply reducing overall levels. Specifically, we show that while environmental political uncertainty reduces green investments, it leads to an increase in non-green investments, revealing a substitution effect that prior investment models do not capture. Further, our study isolates environmental political uncertainty as a distinct driver of investment behavior. This specificity allows us to better understand how firms navigate investment decisions in response to evolving envi-

ronmental policies. In addition, we implement a novel IV approach to causally identify the effect of environmental political uncertainty on investment choices.

Second, we contribute to the growing sustainability literature in finance, particularly in the areas of corporate investment under environmental uncertainty and the financial implications of ESG-related risks. While prior research has examined the effects of climate policy risks on asset prices (e.g., Bolton and Kacperczyk, 2023; Ilhan, Sautner, and Vilkov, 2021) and the role of ESG factors in cost of capital and firm valuation (e.g., Giese, Lee, Melas, Nagy, and Nishikawa (2019)), our study extends this literature by focusing on SCIs, and specifically how environmental political risk shapes corporate green investment decisions. Our findings have implications for investors evaluating climate transition risks, policymakers designing stable regulatory environments, and firms navigating long-term sustainability commitments in an uncertain policy landscape.

Although an extensive literature exists on the relationship between political uncertainty and corporate investment, few studies explore how political risk specifically affects sustainability-related investments. Wang, Wurgler, and Zhang (2023) examine how environmental subsidy uncertainty, driven by weather fluctuations, affects green R&D in Chinese firms. Cohen, Gurun, and Nguyen (2020) show that carbon-intensive firms pioneer green patent production in terms of quantity, quality, and uniqueness. Sautner et al. (2023) find that green patent intensity is related to corporate climate change exposure derived from earnings calls. Wiedemann (2023) shows that firms with greater responsible institutional investments engage more in green investments, measured mainly by green debt, and Albuquerque, Kruttli, Ma, and Watugala (2024) examine how polluting firms strategically accelerate investment before regulatory shocks (the Green Paradox as in Cullen, Mansur, and Meyer, 2023).

Our study differs in several key ways. First, we take a broader perspective, analyzing how environmental political risk shapes corporate green investment decisions globally, which is important given that climate change is a global phenomenon. Second, we examine total green investment, distinguishing between green CAPEX and green R&D, where our main results are driven by green CAPEX. This is important, as R&D represents only 20% of total green investments globally, and in our sample, sustainable CAPEX is 4.5 times larger than sustainable R&D. This distinction also allows us to test differential predictions of investment theories. Third, we explore how systemic political uncertainty—arising from regulatory shifts, geopolitical events, and long-term policy commitments—affects firms' green investment decisions across multiple jurisdictions, where broader political

risks influence financial markets, investor confidence, and strategic planning. This distinction is important, as firms operating across different jurisdictions must navigate not only local policy inconsistencies but also broader political risks that influence financial markets, investor confidence, and strategic decision-making. Fourth, our use of firm-level environmental political uncertainty exposure, measured via textual analysis from earnings calls, provides granular evidence on how specific environmental uncertainties impact capital allocation. In particular, the broad, economy-wide trends and shocks to uncertainty passes through to firms unevenly depending a complex and endogenous mix of local, industry, and firm-level regulatory treatment and factors. As a result, there is substantial dispersion and volatility in firm-level environmental political uncertainty that is meaningfully different from aggregate shifts in the political system (Hassan et al., 2019).

Finally, our results have important policy implications for regulators and investors aiming to foster a low-carbon economy. If environmental political uncertainty discourages SCIs while leaving non-SCIs relatively unaffected, policymakers must consider how inconsistent or unpredictable environmental policies might undermine corporate sustainability efforts. Instead of speeding up the green transition, unpredictable policies may inadvertently push firms toward short-term investments with quick returns and minimal regulatory risk. For investors, our findings suggest that firms facing high environmental political risk may shift their investment strategies in ways that could misalign with sustainability objectives. Institutional investors and asset managers with ESG mandates should recognize that environmental political uncertainty can be a material risk factor affecting firms' ability to meet sustainability targets.

2 Data and Sample Construction

Data on corporate sustainable investments is obtained from Corporate Knights Inc. (CK), a sustainable-economy media and research B Corp founded in 2002. CK produces global sustainability rankings, research reports and financial product ratings based on corporate sustainability performance. It assesses all publicly-traded companies with over US$1 billion in revenue across up to 25 key performance indicators, including sustainable investment, revenue, and racial and gender diversity. Its data sources include annual reports, sustainability reports, proxy/management circulars, and direct engagement with companies.

Sustainable investment is defined as total corporate investment directed towards projects and research categorized as 'sustainable.' CK provides a breakdown of total investment into capital expenditures and R&D and uses its Sustainable Economy Taxonomy in classifying investments as sustainable. This taxonomy is informed by a synthesis of the sources including Climate Bonds Taxonomy (Climate Bonds Initiative), EU Taxonomy for Sustainable Activities, Sustainability Accounting Standards Board (SASB) reporting standards, and TCFD recommended climate opportunity metrics. This is compared to a green dictionary-based approach used to identify green corporate investment among Italian firms in Accetturo, Barboni, Cascarano, Garcia-Appendini, and Tomasi (2022) and Chinese firms in Wang, Wurgler, and Zhang (2023).[7]

As reported in Table 1, information on sustainable investments from this dataset is available for 9,444 firm-year observations with non-missing data on sustainable investments. This dataset includes 2,517 unique firms from 37 countries spanning 2019 through 2022. Table 1 further displays a country breakdown of this sample for SCI and non-SCI. It shows that the average SCI ratio is 1.538% relative to firm assets. Most of this green investment is in green capital expenditures that makes up over four-fifths of this ratio. In dollar terms, the total green investment is $562 billion in 2022 up from $370 billion in 2019. Over our sample period, we observe an upward trend in these investments over time for most countries. In terms of sample composition, US firms make up 28% of the sample, with total green investment ratio of 0.802% relative to firm assets.

[Table 1 here]

To analyze the relation with firm-level environmental political uncertainty, we also merge it with political risk measures derived from earnings conference call data (Hassan et al., 2019). Requiring conference calls and including baseline controls reduces the sample size to 4,570 firm-years, but focuses our analysis on large and the most relevant companies that regularly communicates with investors. This baseline dataset includes 1,282 unique firms from 37 countries. Throughout the paper, we also merge this dataset with Compustat Global, FactSet, and

[7]Other sources include the Environmental Goods and Services Sector (Eurostat), the China Green Bond Endorsed Project Catalogue, the Green Bond Principles, and other private-sector rating agencies with sustainability taxonomies. Additionally, the taxonomy incorporates consultation with industry experts and feedback from government agencies to ensure comprehensive coverage of all relevant sub-sectors and a clear definition of sustainability. The CK Sustainable Economy Taxonomy is available at https://www.corporateknights.com/wp-content/uploads/2021/12/Corporate-Knights-Clean-Taxonomy-4.0.xlsx. For non-financial companies, sustainable investments are defined as any investments aligned with the CK Taxonomy. For financial sector companies, sustainable CAPEX includes investments that enhance operational sustainability, such as greening bank branches or purchasing EVs, and sustainable R&D refers to research and development focused on sustainable finance solutions, such as developing new wealth-management platforms to support values-aligned investing.

LSEG for financial, institutional investor, and ESG-specific data, respectively, which creates minor fluctuations in number of firm-year observations as seen in Table 2

[Table 2 here]

3 Does Environmental Political Uncertainty Affect SCIs?

Our central objective is to study the consequences of environmental political uncertainty for sustainable corporate investments around the world. In Section 3.1, we start by estimating standard panel regressions in a global sample of SCI (and non-SCI) on measures of environmental political uncertainty extracted from earnings conference calls. Section 3.2 proposes a novel shift-share IV estimation strategy to assess causality. Lastly, Section 3.3 investigates whether these effects are driven by the intensive or extensive margin.

3.1 Main Results

Before empirically examining the behavior of sustainable corporate investments, we pose competing predictions. On one hand, the extensive theoretical literature on investment under uncertainty predicts that *any kind of uncertainty* should lower investment at the firm level (e.g., Bernanke (1983), Dixit and Pindyck (1994), or Bloom, Bond, and van Reenen (2007)). However, for several reasons, sustainable corporate investment behavior may deviate from that in standard models. First, we find that SCIs are relatively small proportions of overall investment and thus are possibly compartmentalized from overall investment decisions under uncertainty. So, while standard investment models generally do not distinguish between types of uncertainty, firms should functionally cut investment related to its type of political risk. Second, green-washing – a deceptive practice by companies to exaggerate their environmental appeal (Delmas and Burbano (2011)) – may provide offsetting incentives to main SCIs under uncertainty. Together, these two points imply that the behavior of SCI and non-SCI investment under environmental and non-environmental uncertainty ultimately requires examination of the data.

To test these predictions, for investment (SCI or non-SCI) by firm i in year $t+1$, we estimate the following

panel regression,

$$\text{Investment}_{i,t+1} = \gamma_1 \text{E-PRisk}_{i,t} + \gamma_2 \text{PRisk}_{i,t} + \gamma_3 \text{Non-PRisk}_{i,t} + \lambda \mathbf{X_{i,t}} + \text{FEs} + \epsilon_{i,t}, \tag{1}$$

where $\text{E-PRisk}_{i,t}$ is the firm's environmental political uncertainty in year t, $\text{PRisk}_{i,t}$ ($\text{Non-PRisk}_{i,t}$) is overall political (non-political) uncertainty, and $\mathbf{X_{i,t}}$ is a possible set of controls. Across all specifications, we saturate Eq. (1) with firm, country×year and industry×year fixed effects to control for constant firm effects (such as carbon-intensiveness) and any time-varying country and industry unobserved effects (such as regulations and shocks) that can distinctly affect investment related activity in our estimation. For inference, we report t-statistics based on robust standard errors clustered by firm.[8]

Table 3 reports on our main results for SCI and non-SCI. Column (1) reports our baseline specification with a basic set of controls. The inclusion of overall political and non-political uncertainty as controls means that we interpret the coefficient on E-PRisk as the effect of environmental political uncertainty on next year's investment controlling for all other aspects of political uncertainty. We observe that heightened E-PRisk reduces total sustainable investments with significance at the 5% level ($t = -2.57$). In contrast, controlling for E-PRisk, the coefficients on PRisk and Non-PRisk are insignificant, implying that all other kinds of non-environmental political and non-political uncertainty do not affect SCIs.

[Table 3 here]

We sharpen these interpretations in three important ways. First, news about uncertainty often accompanies news about the level. Thus, following Hassan et al. (2019), we augment the regression with political and non-political sentiment. Second, we also add in the climate change exposure and sentiment measures of Sautner et al. (2023) as E-PRisk may simply proxy for overall environmental and climate exposure and not necessarily the political aspect. Third, although we include firm fixed effects, other distinct time-varying firm effects may confound E-PRisk. Therefore, similar to Gad et al. (2024), to isolate the effect of E-PRisk, we include a battery

[8] In untabulated tests, we also include CEO pay duration as a robustsness check to control for CEOs' incentives, as they can overinvest in sustainable projects to increase their compensation and reputation as ESG leaders at the expense of shareholder value. We find our main results are not sensitive to CEO incentive controls, even though the sample size is drastically reduced due to the unavailability of pay duration for some firms.

of firm-level controls in $\mathbf{X_{i,t}}$ that help explain investment: firm size as measured by the natural log of market capitalization (Log(MCAP)), market-to-book (Log(MB)), profitability (Return-on-Assets or ROA), an indicator for cash constrained (Cash Constrained), leverage (Debt Ratio), domestic and foreign ownership, "generic" firm risk as measured by return volatility (SD(RET)), and ESG scores. For presentation purposes, we suppress the coefficients on these additional controls as indicated by "Other Controls" at the bottom of Table 3, but report the full table in Internet Appendix Table IA.1.

The specification augmented with these three sets of additional controls in Column (2) shows a robust and sizeable decline in SCI related to E-PRisk. Economically, a one standard deviation increase in E-PRisk is associated with a -0.06×17.46 = -1.05 or -0.105% drop in SCI relative to the firm's total assets. This is a 1.05/10.84 = 9.69% drop relative to the sample mean SCI. In dollar terms evaluated at the world average total assets, this represents a $0.105\%\times(67.12\times1000)$ = \$70.48 million cut in total SCI. Columns (3) and (4) further decompose total SCI into physical investment (i.e., capital expenditures) and R&D and show that sustainable CAPEX rather than R&D account for the bulk of the cuts related to E-PRisk. In a similar back-of-envelope calculation, Column (3) implies a one standard deviation increase in E-PRisk is associated with a 0.070% drop in sustainable CAPEX, which is a 8.42% drop relative to its sample mean and a \$46.98 million dollar CAPEX cut.

To test for compartmentalization, the remaining columns of Table 3 repeat our tests so far with non-SCI. Consistent with firm SCI behavior being distinct from typical investment, we observe mostly insignificant relations between non-SCI and E-PRisk, PRisk, or Non-PRisk, respectively. Such results support several possibilities that are hard to separate. Our preferred interpretation is that SCI behavior is compartmentalized from overall investment decisions, and thus an insignificant relation for non-SCI and E-PRisk. However, acknowledging our relatively short sample period, we may simply have no statistical power to explain overall investment, though the type matching between SCI and E-PRisk should be sufficiently powerful (and hence we detect a negative relation). We cautiously rule out insufficient power and side with our preferred interpretation as we do find negative and one marginally significant and negative coefficient on Non-PRisk, consistent with the findings of the broader investment under uncertainty literature.[9]

[9]The investment literature also finds that a prominent predictor of investment is past investment. To address this issue, in untabulated results, we also regress changes in sustainable CAPEX on E-PRisk and similarly find a negative and significant coefficient ($t = -2.32$). We focus on the level of investment in our main analyses because computing changes requires losing a year of observations in our short 4-year sample period.

3.2 IV for Environmental Political Risk

Ex-ante, investment decisions and environmental political risk may be endogenously determined due to possible omitted variables, reverse causality, or strategic firm actions. To address the endogeneity in our main findings, we propose a shift-share (or Bartik (1991)) instrumental variables estimation strategy based on the differential impact of country-level climate disaster shocks for firm-level environmental political risk.

Specifically, motivated by the fact that firms have heterogeneous exposure to aggregate political risk, we follow Hassan et al. (2019) and construct a firm-level rolling 2-year quarterly environmental "political risk beta" by estimating,

$$\text{E-PRisk}_{i,q} = \alpha + \beta_{\text{E-PRisk},i}\overline{\text{PRisk}}_q + \epsilon_{i,t}, \tag{2}$$

where is the world average $\overline{\text{PRisk}}_q$ in year-quarter q and the 2-year window used in the estimation ends in year-quarter q.[10] With these time-varying environmental political risk exposures, our shift-share instrument is then defined as,

$$\text{IV}_{i,t} = \underbrace{\beta_{\text{E-PRisk},i,t-1}}_{\text{Share}} \times \underbrace{\Delta\text{Disasters}_{c,t}}_{\text{Shift}}, \tag{3}$$

where $\beta_{\text{E-PRisk},i,t-1}$ is the most recent environmental "political risk beta" in year $t-1$, and $\Delta\text{Disasters}_{c,t}$ is a climate disaster shock measured by year-to-year changes in the number of climate disasters for country c in year t.[11] This instrument exploits the interaction of two sources of variation: First, the cross-sectional predetermined (i.e., lagged) variation in heterogeneous exposure to aggregate political risk, and second, the time-series exogenous shock induced by country-specific climate disaster shocks.

Therefore, we identify causal effects on SCI using the heterogeneous impact of an aggregate exogenous shock as in Borusyak, Hull, and Jaravel (2022) instead of exogeneity in the shares as in Goldsmith-Pinkham, Sorkin, and Swift (2020). Specifically, Borusyak, Hull, and Jaravel (2022) show that shift-share IV moment conditions are

[10] Although we use the world average in our main specifications, we find nearly identical results using betas relative to country-specific political risk averages.

[11] Results are robust to using shocks relative to 3- or 5-year moving averages.

satisfied when shock-level orthogonality is satisfied. In our setting, this means that we need exposure-weighted country-level shocks to be exogenous. We argue that is plausibly the case: At the shock level, an extensive line of literature (e.g., Cortés and Strahan, 2017; Correa et al., 2023) on the unexpected effects of natural disasters on financial markets supports this contention. Our use of changes in disasters accounts for potential predictability in the level of disasters.

Our inclusion of country×year fixed effects in all specifications addresses two additional threats to identification. First, it controls for the fact that political risk beta exposures don't sum to 1 i.e., $(\sum_{i \in c} \beta_{\text{E-PRisk},i,t-1} \neq 1)$, which resolves the "incomplete shares" concern in Borusyak, Hull, and Jaravel (2022) that IV estimates are biased by systematically different levels of political risk exposures in each country.[12] Second, it helps to satisfy IV exclusion as country×year fixed effects absorb any indirect effect on E-PRisk from aggregate country-level time-varying disasters, and bases the identification solely on the interaction effect of heterogeneous risk exposures and the aggregate shocks for explaining E-PRisk.

To check for IV relevance, Panel A of Table 4 reports on first-stage regressions of E-PRisk on the IV, with control variables as in Eq. (1). Column (1) shows our proposed IV indeed is positively and significantly correlated with E-PRisk. Column (2) adds in additional firm-level controls, resulting in an positive correlation that is significant at the 5% level ($t = 2.54$). The combination of the positive coefficients on the interaction IV and $\beta_{\text{E-PRisk},i,t-1}$ shows, consistent with Hassan et al. (2019)'s findings, that heterogenous exposures to aggregate political risk on average accounts for a portion of firm-level environmental political risk. Adding in the interaction IV further reveals that disaster shocks largely drive this implied average effect as in the absence of disaster shocks the coefficient on $\beta_{\text{E-PRisk},i,t-1}$ by itself is insignificant though still positive.

[Table 4 here]

The remaining columns in Panel A explore when we decompose disaster shocks by whether disasters are unexpectedly more severe (i.e., Positive) or less severe (i.e., Negative). Consistent with the intuition that environmental political uncertainty should be driven by unexpectedly severe shocks, we observe significant and positive increases in E-PRisk during positive shocks but not during negative shocks.

[12] Specifically, Borusyak, Hull, and Jaravel (2022) recommend adding the lagged country-level total exposure as a control variable, which is naturally absorbed by country×year fixed effects.

Panel B of Table 4 reports on second-stage IV regressions of SCI or non-SCI on instrumented E-PRisk, as denoted by $\widehat{\text{E-PRisk}}$. At the 1% level, we find that higher $\widehat{\text{E-PRisk}}$ results in lower total SCI (Column (1), $t = -3.12$) that is almost all accounted for by cuts in sustainable capital expenditures (Column (2), $t = -3.53$). Interestingly, in Columns (2) and (3) we also find *higher* non-SCI in response to $\widehat{\text{E-PRisk}}$. Consistent with Panel A, the remaining columns of Panel B show that these consequences for SCI and non-SCI hold when we use positive shocks to construct the instrument, while in untabulated tests, we find no effect when instrumenting with negative shocks.

Importantly, given the similarity in magnitude but opposing signs on the coefficients for SCI and non-SCI across the board, we interpret the results as supportive of a substitution hypothesis: In response to the environmental political uncertainty induced by unexpected climate disasters, firms are saliently deterred from related sustainable investments and substitute these freed up resources into regular but less sustainable investments. This substitution effect – an *increase in investment due to uncertainty* – presents an interesting contrast with prevailing investment literature that generally reports a negative relationship between investment and uncertainty.[13]

To emphasize that our IV is an exogenous shock, we conduct a falsification test. We plot in Figure 1 the IV estimates from using either the 1-year lead or lag of the interaction IV. In the top panel we observe that there is neither a lead nor lag effect for sustainable CAPEX, while there is indeed a contemporaneous (relative to the shock year) cut in sustainable CAPEX and substitution into regular CAPEX. In the bottom panel, we consistently observe no effects on R&D.

Lastly, we note that aggregate disasters shock the overall political environment though it most saliently contribute to E-PRisk. Thus, a final threat to identification (via the IV exclusion criteria) is the possibility that disaster shocks affect *other* types of political uncertainty, which may heterogeneously impact SCI via $\beta_{\text{E-PRisk},i,t-1}$ exposure. For example, Hassan et al. (2019) also constructs technological political risk that, in our IV setting, could capture a scenario in which disaster shocks politically impact the adoption of green technologies. Therefore, we include as one-by-one controls in our IV regressions each of the other seven political risk topics from Hassan et al. (2019) and a residual PRisk measure constructed from a regression of overall PRisk on all of the PRisk topics. In Internet Appendix Table IA.2, we find that the $\widehat{\text{E-PRisk}}$ effect is robust to these additional controls.

[13] An important exception is the case of R&D where uncertainty can increase its growth value e.g., Atanassov, Julio, and Leng (2024).

Overall, our novel shift-share IV estimation shows that firm-level environmental political uncertainty causes firms to cut SCI. In comparison with our main results where non-SCI do not respond to E-PRisk, we further find evidence for substitution of SCI into non-SCI with high $\widehat{\text{E-PRisk}}$. We explore this hypothesis in more detail in the next subsection and in Section 4.

3.3 Intensive vs. Extensive Margin

A natural follow-up question is whether these effects manifest along the intensive or extensive margins. Understanding whether environmental political uncertainty impedes firms from investing in SCI at all or whether it simply reflects cuts in existing SCI is informative for policymaking when designing effective interventions for mitigating environmental political risk as well as for economic modeling. For this analysis and the rest of the paper, we 1) focus on the effect on sustainable CAPEX, unless otherwise noted, as that accounts for the bulk of the total SCI sensitivity to E-PRisk, and 2) report both IV and OLS estimates for identification and external validity, respectively.

Panel A of Table 5 investigates this issue by replacing our main dependent variable of interest in Eq. (1) with an indicator for whether a firm has non-zero total SCI. In Columns (1) and (2), we find that both IV and OLS regressions detect insignificant effects on the likelihood of SCI adoption by firms in the presence of E-PRisk. In contrast, along the intensive margin using the sub-sample of firms with pre-existing SCI, we find in Columns (3) and (4) sizeable cuts in sustainable CAPEX due to E-PRisk. Consistent with the implications of the intensive margin being more important, the statistical significance of our results ($t = -6.79$ for $\widehat{\text{E-PRisk}}$ and $t = -3.16$ for E-PRisk) are much higher in this sub-sample than in the main sample.

[Table 5 here]

Panels B and C of Table 5 complement the SCI findings in Panel A by examining the substitution effect. Given firms' probability of making sustainable investment is uncorrelated with E-PRisk, an important testable implication is that firms can only cut and substitute SCI if they have existing SCI. Panel B tests this economic constraint and finds support: the former two columns reveal that substitution into sustainable CAPEX occurs only along the intensive margin, while the latter two columns indicate no substitution among firms with zero

total SCI. Panel C checks for and rejects the possibility that freed up resources from sustainable CAPEX cuts pass-through to simply cash or other forms of non-SCI investment such as R&D or even mergers and acquisitions.

Altogether, these results paint a consistent picture: the effect of E-PRisk for SCI and the substitution into non-SCI occurs only for firms with existing SCI, while E-PRisk does not impact the decision to make sustainable investments.

4 Relation to Models of Investment under Uncertainty

We next conduct cross-sectional sub-sample analysis to further assess the nature of SCI behavior under environmental political uncertainty. To organize, we "split" our investigations of E-PRisk into cross-sectional tests on the role of uncertainty (or "Risk", here in Section 4), and then on the role of environmental and political beliefs (or "E-P", in subsequent sections). Our examination of the cross-sectional effects of risk is based on the predictions of models of firm investment under uncertainty that highlight the dual roles of asset redeployability and financial constraints.

4.1 Asset Redeployability

The redeployability channel highlights that economically specialized assets are more adversely affected by economic uncertainty (Kim and Kung (2017)). In essence, less redeployable assets are those that cannot easily repurpose or liquidate during uncertain times, making firms cautious and leading to reduced investment. In contrast, firms with highly redeployable assets are able to flexibly manage uncertainty. As a result, we expect the effects of E-PRisk to concentrate in firms that hold less redeployable assets.

To test this proposition, we use the asset redeployability score, provided by Kim and Kung (2017), that measures the extent to which assets are deployed and salable across industries. We focus on the industry measure rather than the US-only firm-level measure in order to extend redeployability to an international sample. After merging to our data, the sample average redeployability is 0.39, which matches the average reported for US firms by Kim and Kung (2017). However, the variability measured by standard deviation is higher in our setting at 0.15 vs. 0.06. We then split our sample into more or less redeployable sub-samples based on the sample cross-sectional

median of lagged redeployability each year.

Table 6 reports on the results. Comparing Columns (1) and (2) with (3) and (4), we observe that indeed the sensitivity of sustainable CAPEX to E-PRisk is driven by firms in less redeployable industries. Highlighting the importance of redeployability, the statistical significance in Columns (3) and (4) are also much higher than in our main tests ($t = -5.81$ for $\widehat{\text{E-PRisk}}$ and $t = -3.43$ for E-PRisk). Comparing Columns (5) and (6) with (7) and (8), we also detect substitution into regular CAPEX only in the case of unexpected disaster shocks for firms in less redeployable industries.

[Table 6 here]

That substitution can occur even for firms in less redeployable industries demonstrates a difference between the related concepts of asset redeployability and substitution: the former refers to the extent to which assets have alternative uses across projects, *a characteristic of the asset*, while the latter refers to the ability to flexibly pivot to another different project when economic conditions change, *an operational characteristic of the firm* (e.g., Gu, Hackbarth, and Johnson (2018). So, asset substitution by firms can occur even when the asset is not very redeployable. Such pivots may prove more challenging and costly, but our evidence on it underscores the sizeable impact of environmental political uncertainty on SCI.

4.2 Financial Constraints

We next examine the role of financial constraints (e.g., Hennessy, Levy, and Whited (2007)), an important friction that contributes to investment irreversibility and the real effects of political uncertainty. How it influences the effect of environmental political uncertainty on SCI is unclear. On one hand, uncertainty should be more costly for financially constrained firms because they want to avoid risky bets that may worsen their constraints, face higher costs of capital when switching investments, and are more risk averse due to their limited ability to recover from bad economic states. On the other, Gilchrist, Sim, and Zakrajšek (2014) provide compelling micro-evidence on the interaction of uncertainty and financial constraints, concluding that the effect of uncertainty on investment operates through the financial constraint channel. Thus, one can alternately expect that constrained firms, whose credit spreads are already high, are insensitive to heightened environmental political uncertainty.

To explore this tension, we follow standard practice in the literature and compute the Size-Age or "SA" Index of Hadlock and Pierce (2010) to proxy for financial constraints. We adopt this measure as it is a robust measure that is readily available for an international sample of firms.[14] We then split our sample into more or less constrained sub-samples based on the sample cross-sectional median of lagged SA Index each year.

We report results in Table 7, and find the negative SCI-EPRisk sensitivity concentrates among unconstrained firms. In the first four columns, we observe negative (insignificant) coefficients for less (more) constrained firms. Among these less constrained firms, the statistical significance in Columns (3) and (4) are also much higher than in our main tests ($t = -7.10$ for $\widehat{\text{E-PRisk}}$ and $t = -3.43$ for E-PRisk). In the last four columns, we also continue to find asset substitution into non-sustainable CAPEX. These results echo the findings of Kim and Kung (2017) that also document concentrated effects of uncertainty among unconstrained firms.[15] More broadly, they support the economic mechanism proposed by Gilchrist, Sim, and Zakrajšek (2014) that uncertainty operates through the financial constraints channel. Thus, only unconstrained firms with low credit spreads have the "room" to let environmental political uncertainty impact their SCI plans.

[Table 7 here]

5 Carbon Intensive Firms and Institutional Investors

5.1 Carbon-intensity

In this subsection, we examine the impact of carbon-intensiveness on the relationship between green investments and environmental political uncertainty. High carbon-intensive firms are more exposed to potential regulatory changes, such as carbon pricing, emissions caps, or clean energy mandates. If these firms expect stricter policies, they might preemptively invest in SCIs to prepare for compliance. However, under political uncertainty, they may delay SCIs until there is more clarity on future regulations.

We use the level of CO2 emissions to identify firms in carbon-intensive industries. Table 8 shows that when environmental political uncertainty rises, firms with higher carbon intensity significantly reduce SCIs, as indicated

[14] For example, Hadlock and Pierce (2010) note that this measure is extremely highly correlated with the WW index constructed from a structural model of investment (Whited and Wu (2006)).

[15] See Online Appendix Table 2 of Kim and Kung (2017) for this result.

by negative and significant coefficient estimates in the first two columns. This suggests that high-carbon firms, which are more exposed to potential regulatory costs, are particularly sensitive to political uncertainty and choose to delay or cut back on green investments. These firms also redirect capital away from SCIs toward non-SCIs under uncertainty, as suggested by a positive and significant coefficient estimate of 0.47 ($t = 2.34$ for $\widehat{\text{E-PRisk}}$ in column (5). This substitution effect suggests that when facing unclear regulatory signals, firms prioritize investments in traditional, core business activities rather than uncertain sustainability projects.

[Table 8 here]

In contrast, other firms show a much weaker relationship between environmental political uncertainty and SCIs, suggesting they are less reliant on political stability to continue investing in sustainability. Overall, Table 8 highlights that carbon-intensive firms are particularly sensitive to environmental political risk, reducing SCIs more aggressively than low-carbon firms and potentially substituting into non-SCIs.

5.2 ESG Investors

Long-term ESG-focused investors are explicitly committed to sustainability goals, and may pressure firms to continue SCIs even under political uncertainty, discouraging firms from shifting capital toward non-SCIs by engaging privately with portfolio firms (Dimson, Karakas, and Li, 2015), casting votes on environmental and social proposals (Dikolli, Frank, and Guo, 2022), and subtly shaping governance structures to enhance corporate responsiveness to investor concerns. On the other hand, they tend to have a broad, long-term market exposure and may be less inclined to push firms toward risky green investments during uncertain periods. Prior research on corporate ESG activities indicates that both Big 3 investors and socially responsible investors can influence firms to strengthen their ESG practices (e.g., Azar et al., 2021; Dikolli, Frank, and Guo, 2022; Kim, Wan, Wang, and Yang, 2019). Accordingly, we disaggregate total institutional ownership along the dimensions of the Big 3 (BlackRock, Vanguard, State Street) and UN-PRI signatories.

Table 9 reports that firms with higher Big 3 or UN-PRI ownership reduce SCIs more significantly in response to environmental political risk than other firms. Further, they substitute away from SCIs toward non-SCIs under environmental political uncertainty. The findings suggest that Big 3 and UN-PRI institutional investors

encourage firms to prioritize financial stability over green investment commitments during uncertain times. They also indicate that such investors shape not only whether firms reduce SCIs under uncertainty, but also whether they reallocate capital toward non-SCIs.

[Table 9 here]

6 Role of Social Norms

We next examine how country-level social norms with regards to climate change influence the relationship between environmental political risk and sustainable corporate investments. Previous studies show a strong impact of cultural values on corporate ESG activities and institutional investors' decisions (e.g., Dyck, Lins, Roth, and Wagner, 2019; Starks, 2023; Ilhan, Krueger, Sautner, and Stark, 2023) In environments with weak pro-environmental social norms, firms may not face strong public or consumer backlash (e.g., brand damage, consumer boycotts, and reputational risks) for cutting green investments, making it easier to reduce SCIs.

In Table 10, we use two variables to proxy for a country's societal norms. The first one comes form the World Values Survey, a composite measure of the society's perceptions of the climate change as used in (Dyck et al., 2019). Panel A reports results from this proxy. The first four columns show that firms in countries with weaker environmental norms reduce SCIs aggressively in response to E-PRisk whereas no such effect is observed in countries with strong pro-environmental social norms. While countries with strong environmental norms tend to attract more ESG-conscious investors and more likely to adopt sustainability as part of their corporate culture, which may pressure firms to maintain SCIs, our countryXyear fixed effects capture such effects perfectly. The evidence in panel A suggests that societal expectations reinforce corporate green commitments, making firms less likely to abandon SCIs despite political uncertainty.

[Table 10 here]

In panel B, we use an alternative proxy from the International Public Opinion on Climate Change survey by Yale School of the Environment based on the extent to which people are more or less worried about climate change as a threat. The results mirror those in panel A, where firms operating in countries with stronger environmental

social norms are less likely to reduce SCIs under E-PRisk, whereas firms in countries with weaker environmental norms are more likely to cut or substitute away from SCIs.

Overall, these results suggest that societal expectations reinforce corporate green commitments, making firms less likely to abandon SCIs despite political uncertainty. Countries with strong environmental norms help buffer SCIs from political uncertainty, making corporate green investments more stable over time. these findings also imply that policymakers and investors in countries where environmental awareness is low may need to provide stronger incentives (e.g., financial penalties for emissions, green subsidies) to counteract the lack of social pressure.

7 Political Norms

There is a vast literature on investor protection and corporate behavior documenting that that investor protection is a key determinant of corporate investment policies (e.g., Shleifer and Vishny, 1993; Shleifer and Vishny, 1997; Acemoglu, Johnson, and Robinson, 2001). In particular, political stability allows firms to be more confident in policy continuity, reducing the risk of sudden regulatory shifts that could make investments unprofitable. Firms in politically unstable countries face higher risks of policy reversals, expropriation, and economic disruptions, making them more likely to delay, scale back, or cancel long-term projects (Julio and Yook, 2012; Pastor and Veronesi, 2013).

Thus, we examine, in Table 11 the role of political stability in determining the relation between green investments and environmental political risk. Panel A of Table 10 shows that weak institutions amplify SCI reductions and increase substitution into Non-SCIs. Specifically, we observe that firms in countries with weaker political institutions reduce SCIs more aggressively in response to heightened E-PRisk. They also swith to projects not related to green investments afterwards.

[Table 11 here]

We also use corruption as another important factor in firms' investment decisions, which increases uncertainty, raising transaction costs, and reducing the expected returns on long-term projects (e.g., Mauro, 1995; Wei, 2000). In environments where bribery and rent-seeking behaviors are prevalent, firms may be reluctant to commit capital to investments that require regulatory stability, fearing that future policy changes or arbitrary government actions

could erode profitability (e.g., Shleifer and Vishny, 1993; Acharya, Amihud, and Litov, 2011).Panel B of Table 10 shows that the results in panel A are robust to this alternative measure of political investment environment. Firms in countries with less corruption practices exhibit a weaker reduction in SCIs under E-PRisk.

These results suggest that the strength of a country's political institutions significantly influences how firms respond to environmental political uncertainty. Firms in strong institutional settings maintain SCIs more effectively, while those in weak institutional environments cut SCIs more aggressively and substitute into non-SCIs. Ensuring regulatory stability and policy enforcement is critical to fostering long-term corporate sustainability investments.

8 Conclusion

Uncertainty can inadvertently slow corporate action on environmental issues, as firms hesitate to commit to long-term sustainability projects amid unclear or volatile regulatory landscapes. Instead of accelerating the green transition, unpredictable policies may have the unintended consequence of reinforcing short-term decision-making, where firms favor investments with immediate returns and lower regulatory risks. This hesitation could delay progress toward climate goals, ultimately undermining global sustainability efforts.

Our study provides strong evidence that environmental political uncertainty significantly dampens sustainable corporate investments (SCIs), leading firms to reallocate capital away from green initiatives and toward conventional projects. Using a shift-share instrumental variable approach, we establish a causal link between environmental political risk and SCI reductions, showing that heightened uncertainty drives firms to prioritize investments with higher asset redeployability and lower regulatory exposure. This effect is particularly pronounced among financially unconstrained firms, highlighting the role of capital flexibility in mitigating uncertainty-driven investment shifts. Moreover, these results are especially evident in countries with weaker societal norms regarding climate change, suggesting that firms in such environments may be less inclined to commit to long-term sustainability investments when faced with political uncertainty.

Uncertainty can cause firms to delay or scale back actions aimed at addressing environmental concerns, as the lack of regulatory clarity increases the perceived risks associated with SCIs. These findings align with real options

theory (e.g., McDonald and Siegel, 1986), which suggests that SCIs differ from traditional investments due to their greater dependence on policy incentives (e.g., subsidies, carbon pricing), longer investment horizons, and higher irreversibility. For instance, a firm investing in electric vehicle charging infrastructure has limited flexibility to re-purpose these assets if policies shift, whereas a firm investing in conventional machinery faces fewer constraints in reallocating capital.

Our findings contribute to the broader literature on investment under uncertainty and corporate sustainability by demonstrating the nuanced ways in which firms respond to environmental political risk. While traditional investment theories predict a uniform decline in investment amid uncertainty, we document a substitution effect, where firms reallocate resources rather than merely cutting capital expenditures. This distinction is crucial for policymakers and investors aiming to foster a stable and predictable green investment landscape.

Ultimately, our study underscores the critical role of environmental political risk in shaping the future of corporate sustainability efforts. As climate-related policies and regulations continue to evolve, ensuring a stable and predictable policy environment will be essential to sustaining the momentum of global green investment. Given the urgency of climate change and the vast sums of capital being directed toward addressing it, future research could explore critical questions such as the emissions and valuation effects of SCIs, as well as the behavioral aspects of corporate decision-making under uncertainty in the context of sustainability.

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Figures and Tables

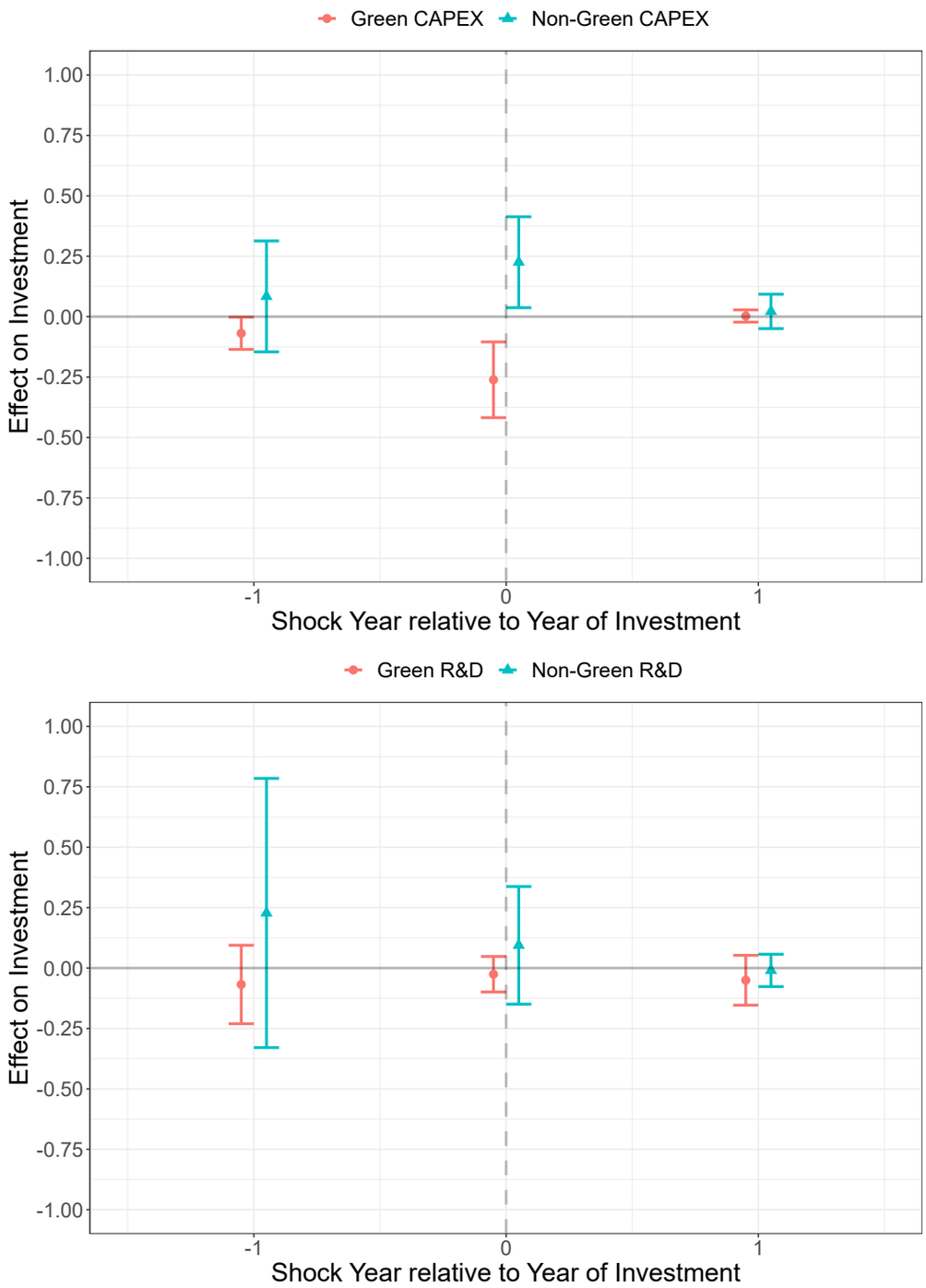


Figure 1: A Falsification Test of the IV Shock

This figure plots the second-stage IV coefficient and its 95% confidence interval for when we instrument environmental political risk with past, contemporaneous, and future shift-share shocks. The top (bottom) figure plots the response for capital expenditures (research and development) investments.

Table 1: Firm-level Sustainable Corporate Investments by Country
This table reports the distribution of firm size and investment by country from 2019 to 2022. We report the top 30 countries by number of firm-years (Obs.), these firms' size measured by book assets (Assets), and the breakdown of their total investment by sustainable (Green) vs. non-sustainable (Non-Green) and capital expenditures (CAPEX) vs. research and development (R&D).

			Green (% of Assets ×10)			Non-Green (% of Assets ×10)		
Country	Obs.	Assets ($Bil)	Total Inv.	CAPEX	R&D	Total Inv.	CAPEX	R&D
United States	2,643	65.16	8.02	5.22	2.80	65.53	35.76	29.77
Japan	1,113	85.26	4.05	3.18	0.87	64.83	45.22	19.61
China	961	61.60	30.09	25.05	5.04	82.35	57.41	24.95
Canada	447	80.99	11.52	10.97	0.55	50.08	42.53	7.55
United Kingdom	412	139.27	9.10	8.54	0.56	58.46	35.55	22.80
India	409	23.75	45.67	45.13	0.54	158.85	148.69	9.74
Taiwan	369	32.08	13.47	9.69	3.78	137.99	88.73	49.26
South Korea	353	49.40	11.27	8.47	2.80	84.63	63.64	20.53
France	294	139.14	14.31	12.79	1.52	55.93	41.39	14.54
Germany	286	95.09	14.08	9.95	4.13	63.75	39.55	24.21
Switzerland	194	68.12	7.30	6.53	0.77	180.26	30.52	149.74
Brazil	193	36.57	35.09	33.99	1.10	109.11	52.72	55.46
Hong Kong	170	14.95	20.87	18.24	2.62	61.06	49.77	11.29
Sweden	163	34.86	15.38	9.98	5.41	39.27	26.33	12.94
Italy	140	122.05	35.64	35.42	0.22	49.79	36.98	12.81
Saudi Arabia	136	39.53	8.78	6.38	2.40	67.44	64.35	3.09
Netherlands	134	78.17	12.40	9.22	3.19	220.30	97.96	122.35
Malaysia	123	25.35	15.86	15.86	0.00	235.59	116.59	119.01
Thailand	113	6.44	25.06	22.86	2.20	128.93	115.23	13.70
Spain	101	168.53	53.87	53.35	0.52	62.85	38.39	24.46
Ireland	92	28.49	4.58	3.15	1.43	53.45	29.31	24.14
Norway	84	33.87	10.31	10.31	0.00	46.85	39.74	7.11
Mexico	79	20.70	6.38	5.91	0.47	78.75	76.26	1.32
Russia	75	76.64	51.37	51.37	0.00	1588.06	1548.58	39.48
Finland	70	49.75	21.34	18.68	2.65	113.01	35.84	77.17
Israel	70	35.08	61.65	58.48	3.17	65.39	28.22	37.17
Denmark	60	54.65	22.28	18.10	4.18	104.45	30.96	73.49
Singapore	35	15.25	10.26	6.68	3.58	81.63	55.28	26.35
South Africa	27	31.23	3.52	3.52	0.00	58.37	58.34	0.03
Belgium	26	13.80	2.77	2.77	0.00	65.41	64.65	0.76
Other Countries	72	9.34	17.02	16.54	0.48	89.32	49.36	39.96
World	9,444	67.12	15.38	13.06	2.32	93.90	64.22	29.62

Table 2: Summary Statistics

This table reports sample summary statistics on firms' investment, political risk and sentiment, and other characteristics from 2019 to 2022. Obs., Mean, SD, Median, Q0.10, Q0.25, Q0.75, and Q0.90 report on the sample observations, average, standard deviation, median, the 10th, 25th, 75th, and 90th percentiles, respectively.

	Obs.	Mean	SD	Median	Q0.1	Q0.25	Q0.75	Q0.9
Investment Measures								
Total Green Investment	4570	10.84	57.67	0.01	0.00	0.00	1.72	27.30
Green CAPEX	4570	8.29	38.44	0.00	0.00	0.00	1.03	21.36
Green R&D	4570	2.55	41.48	0.00	0.00	0.00	0.00	0.00
Total Non-Green Investment	4570	95.47	443.59	51.04	8.63	25.66	92.37	157.94
Non-Green CAPEX	4570	64.73	366.52	30.56	5.06	13.73	57.45	105.81
Non-Green R&D	4570	30.74	181.95	1.95	0.00	0.00	28.85	82.20
Political Risk and Exposure Measures								
E-PRisk	4570	4.53	17.46	1.84	0.09	0.60	4.25	9.49
$\beta_{\text{E-PRisk}}$	3758	0.02	0.53	0.01	-0.15	-0.04	0.09	0.22
PRisk	4570	0.13	0.23	0.07	0.00	0.02	0.15	0.29
Non-PRisk	4570	0.76	1.18	0.43	0.02	0.14	0.94	1.71
PSentiment	4570	1.38	1.31	1.32	-0.02	0.61	2.09	2.88
Non-PSentiment	4570	13.95	14.52	12.52	-0.59	5.71	20.73	31.11
Other Firm- and Country-level Variables								
CC Exposure	4360	2.40	4.09	0.67	0.09	0.24	2.33	7.57
CC Sentiment	4360	0.50	1.09	0.14	-0.11	0.00	0.53	1.63
Market Capitalization ($Bil)	4494	33.88	95.05	12.97	3.10	6.69	29.05	68.22
Market-to-Book	4444	2.70	8.56	1.36	0.59	0.84	2.57	5.07
ROA	4411	0.12	0.11	0.11	0.04	0.08	0.16	0.23
Cash Constrained	4570	0.47	0.50	0.00	0.00	0.00	1.00	1.00
Total Debt Ratio	4570	0.32	0.21	0.31	0.08	0.19	0.43	0.54
Domestic Ownership (%)	4570	27.40	31.07	11.77	0.00	0.00	61.10	75.85
Foreign Ownership (%)	4570	13.86	14.36	11.90	0.00	0.00	19.56	32.33
Return SD	4423	0.33	0.32	0.26	0.11	0.17	0.38	0.60
ESG Score	4457	61.26	17.90	64.01	34.86	49.36	75.28	82.68
Disasters (N)	4187	16.77	12.95	20.00	2.00	4.00	23.00	43.00
Disaster Damages	4187	50.28	53.87	27.59	0.00	1.47	90.18	160.26
Re-deployability Score	3050	0.39	0.15	0.39	0.23	0.31	0.43	0.49
SA Index	4469	0.12	1.77	1.00	-2.49	-2.49	1.43	1.76
CO2 Intensity	3668	72.61	4370.13	0.05	0.01	0.02	0.30	1.09
Big-3 Ownership	4570	9.28	9.88	4.79	0.00	0.00	19.40	23.96
UN PRI Ownership	4570	20.40	18.70	15.50	0.00	0.00	37.96	47.28
Control of Corruption Index	4550	1.14	0.70	1.29	-0.29	1.04	1.48	1.88
Political Stability Index	4550	0.32	0.53	0.26	-0.47	0.01	0.79	1.02
World Values ES Index	4382	0.53	0.07	0.53	0.43	0.53	0.55	0.60
Climate Worries Index	4423	0.74	0.08	0.68	0.68	0.68	0.79	0.88

Table 3: Environmental Political Risk and Investment

This table reports on results from regressions of investment on environmental political risk as described in Eq. (1). The dependent variable at time $t+1$ is firms' total, capital expenditure, or R&D investment. The key variable of interest is E-PRisk in year t, which is environmental political risk measured from firms' conference calls. Columns (1)–(4) and (5)–(8) focus on Green and Non-Green investments, respectively. Columns (2)–(4) and (6)–(8) include other controls (e.g., firm size) that are omitted for presentation purposes. See Appendix Table IA.1 for the full table. t-statistics in parentheses are computed from the variance-covariance matrix clustered by firm. *, **, and *** indicate statistical significance at the ten-, five-, and one-percent level, respectively.

	Green				Non-Green			
Dep Var:	Total Investment		CAPEX	R&D	Total Investment		CAPEX	R&D
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
E-PRisk	-0.05^{**}	-0.06^{***}	-0.04^{***}	-0.02	-0.08	-0.06	-0.03	-0.03
	(-2.57)	(-2.64)	(-3.04)	(-1.00)	(-0.61)	(-0.74)	(-0.43)	(-0.51)
PRisk	3.28	3.26	2.80	0.46	0.41	0.86	4.64	-3.78
	(1.46)	(1.46)	(1.59)	(0.34)	(0.03)	(0.08)	(0.51)	(-0.76)
Non-PRisk	0.24	-0.23	-0.67	0.44	-0.74	-2.31	-5.92^{*}	3.61
	(0.35)	(-0.31)	(-1.05)	(1.22)	(-0.21)	(-0.56)	(-1.67)	(1.57)
PSentiment		0.76	0.72	0.04		4.28	4.29	-0.004
		(1.44)	(1.49)	(0.18)		(0.92)	(0.93)	(-0.004)
Non-PSentiment		-0.06	-0.01	-0.06		0.74^{*}	0.82^{**}	-0.07
		(-0.87)	(-0.15)	(-0.98)		(1.83)	(2.11)	(-0.59)
CC Exposure		-0.61	-0.20	-0.41		-5.03	-6.71^{*}	1.67
		(-1.20)	(-0.49)	(-1.35)		(-1.14)	(-1.89)	(0.63)
CC Sentiment		0.02	-0.40	0.41		20.14^{***}	11.80^{**}	8.34^{*}
		(0.01)	(-0.37)	(0.92)		(2.64)	(2.02)	(1.71)
Firm FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Country×Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Industry×Year FEs	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Other Controls	No	Yes	Yes	Yes	No	Yes	Yes	Yes
N	4,570	3,996	3,996	3,996	4,570	3,996	3,996	3,996
Adjusted R^2	0.23	0.22	0.53	-0.06	0.52	0.71	0.76	0.24

Table 4: Shift-Share Instrumental Variable Regressions

This table reports on results from instrumental variable regressions of investment on environmental political risk. Panel A reports on first-stage regressions of E-PRisk$_{i,t}$ on the interaction of firm-level environmental political risk beta ($\beta_{\text{E-PRisk},i,t-1}$) and country-level climate disaster shocks (Shock$_{c,t}$) as described in Eqs. (2) and (3), respectively. Panel B reports on second-stage regressions of firms' total or capital expenditure investment in year $t+1$ on $\widehat{\text{E-PRisk}}$, which is E-PRisk$_{i,t}$ instrumented with $\beta_{\text{E-PRisk},i,t-1} \times \text{Shock}_{c,t}$. Other controls (e.g., PRisk, Non-PRisk, firm size, etc.) consistent with the OLS regression described in Eq. (1) are omitted for presentation purposes. t-statistics in parentheses and IV F-statistics are computed from the variance-covariance matrix clustered by firm. *, **, and *** indicate statistical significance at the ten-, five-, and one-percent level, respectively.

Panel A: First-stage Regressions

Shock:	ΔDisasters		Positive Shocks		Negative Shocks	
Dep Var:	E-PRisk$_{i,t}$					
	(1)	(2)	(3)	(4)	(5)	(6)
$\beta_{\text{E-PRisk},i,t-1} \times \text{Shock}_{c,t}$	1.68*	1.47**	1.51**	1.28**	6.51	6.48
	(1.96)	(2.54)	(1.98)	(2.38)	(1.29)	(1.63)
$\beta_{\text{E-PRisk},i,t-1}$	4.14	4.74	1.12	2.19	16.25	17.33
	(1.27)	(1.60)	(0.50)	(0.90)	(1.25)	(1.61)
Firm FE	Yes	Yes	Yes	Yes	Yes	Yes
Country×Year FE	Yes	Yes	Yes	Yes	Yes	Yes
Industry×Year FEs	Yes	Yes	Yes	Yes	Yes	Yes
Other Controls	No	Yes	No	Yes	No	Yes
N	3,395	3,081	3,395	3,081	3,395	3,081
Adjusted R^2	0.02	0.28	−0.01	0.26	0.03	0.30
IV $F-$statistic	3.83**	6.45**	3.92**	5.64**	1.67	2.64

Panel B: Second-stage Regressions

Shock:	ΔDisasters				Positive Shocks			
	Green		Non-Green		Green		Non-Green	
Dep Var:	Tot. Inv.	CAPEX	Tot. Inv.	CAPEX	Tot. Inv.	CAPEX	Tot. Inv.	CAPEX
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
$\widehat{\text{E-PRisk}}$	-0.26^{***}	-0.25^{***}	0.34^{*}	0.26^{**}	-0.27^{***}	-0.31^{***}	0.44^{*}	0.28^{**}
	(-3.12)	(-3.53)	(1.92)	(2.38)	(-3.10)	(-3.16)	(1.77)	(2.27)
$\beta_{\text{E-PRisk}}$	0.13	0.74	-0.25	0.70	0.20	1.01	-0.72	0.57
	(0.11)	(1.28)	(-0.11)	(0.42)	(0.14)	(1.41)	(-0.27)	(0.30)
Firm FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Country×Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Industry×Year FEs	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Other Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
N	3,081	3,081	3,081	3,081	3,081	3,081	3,081	3,081
Adjusted R^2	0.12	0.88	0.73	0.72	0.12	0.87	0.73	0.72

Table 5: Intensive vs. Extensive Margins of Green Investment
This table reports on the results of IV and OLS regressions along the intensive and extensive margins of green investment. Panel A examines the extensive margin effect of environmental political risk for an indicator for non-zero green investment in Columns (1)–(2), and the intensive margin effect for Green CAPEX in the sub-sample of non-zero green investment in Columns (3)–(4). Panel B examines the effects on Non-Green CAPEX in the intensive margin sub-sample and its complementary sub-sample with zero green investment. Panel C examines if the intensive margin effect of E-PRisk on green investment creates substitution into cash, non-green R&D, and non-green M&A. Other controls (e.g., PRisk, Non-PRisk, firm size, etc.) consistent with the OLS regression described in Eq. (1) are omitted for presentation purposes. t-statistics in parentheses are computed from the variance-covariance matrix clustered by firm. *, **, and *** indicate statistical significance at the ten-, five-, and one-percent level, respectively.

Panel A: Intensive vs. Extensive Margin

	Extensive Margin		Intensive Margin	
Dep Var:	I(Green >0)		Green CAPEX	
	(1)	(2)	(3)	(4)
$\widehat{\text{E-PRisk}}$	-0.04		-0.21^{***}	
	(-0.29)		(-6.79)	
E-PRisk		0.01		-0.04^{***}
		(0.55)		(-3.16)
Firm FE	Yes	Yes	Yes	Yes
Country×Year FE	Yes	Yes	Yes	Yes
Industry×Year FEs	Yes	Yes	Yes	Yes
Other Controls	Yes	Yes	Yes	Yes
N	3,062	3,376	1,639	1,825
Adjusted R^2	0.61	0.61	0.88	0.88

Panel B: Effects on Non-Green CAPEX

	Intensive Margin		No Green Inv.	
Dep Var:	Non-Green CAPEX			
	(1)	(2)	(3)	(4)
$\widehat{\text{E-PRisk}}$	0.20^{***}		-11.52	
	(2.87)		(-0.05)	
E-PRisk		0.04^{*}		0.03
		(1.80)		(0.30)
Firm FE	Yes	Yes	Yes	Yes
Country×Year FE	Yes	Yes	Yes	Yes
Industry×Year FEs	Yes	Yes	Yes	Yes
Other Controls	Yes	Yes	Yes	Yes
N	1,639	1,825	1,421	1,547
Adjusted R^2	0.47	0.51	0.91	0.99

Panel C: Other Potential Outlets for Substitution

	Intensive Margin					
Dep Var:	Cash		Non-Green R&D		Non-Green M&A	
	(1)	(2)	(3)	(4)	(5)	(6)
$\widehat{\text{E-PRisk}}$	0.02		0.03		0.02	
	(0.16)		(0.16)		(0.32)	
E-PRisk		0.01		-0.07		0.05^{**}
		(0.30)		(-1.04)		(2.22)
Firm FE	Yes	Yes	Yes	Yes	Yes	Yes
Country×Year FE	Yes	Yes	Yes	Yes	Yes	Yes
Industry×Year FEs	Yes	Yes	Yes	Yes	Yes	Yes
Other Controls	Yes	Yes	Yes	Yes	Yes	Yes
N	1,586	1,773	1,639	1,825	1,639	1,825
Adjusted R^2	0.70	0.71	0.56	0.28	0.25	0.21

Table 6: Role of Asset Re-deployability
This table reports on the results of IV and OLS regressions for sub-samples split on the asset re-deployability measure of Kim and Kung (2017). Sub-samples are determined by the median of lagged asset re-deployability by year. Other controls (e.g., PRisk, Non-PRisk, firm size, etc.) consistent with the OLS regression described in Eq. (1) are omitted for presentation purposes. t-statistics in parentheses are computed from the variance-covariance matrix clustered by firm. *, **, and *** indicate statistical significance at the ten-, five-, and one-percent level, respectively.

Dep Var:	Green CAPEX				Non-Green CAPEX			
	More Reployable		Less Reployable		More Reployable		Less Reployable	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
$\widehat{\text{E-PRisk}}$	1.82		-0.26^{***}		-6.02		0.29^{***}	
	(0.98)		(-5.81)		(-0.73)		(3.37)	
E-PRisk		0.03		-0.03^{***}		0.01		-0.02
		(0.74)		(-3.43)		(0.14)		(-0.90)
Firm FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Country×Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Industry×Year FEs	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Other Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
N	920	1,018	1,138	1,261	920	1,018	1,138	1,261
Adjusted R^2	0.02	0.79	0.85	0.87	0.43	0.86	0.98	0.98

Table 7: Role of Financial Constraints
This table reports on the results of IV and OLS regressions for sub-samples split on the financial constraints measure of Hadlock and Pierce (2010). Sub-samples are determined by the median of lagged financial constraints (i.e., the Size-Age or SA Index) by year. Other controls (e.g., PRisk, Non-PRisk, firm size, etc.) consistent with the OLS regression described in Eq. (1) are omitted for presentation purposes. t-statistics in parentheses are computed from the variance-covariance matrix clustered by firm. *, **, and *** indicate statistical significance at the ten-, five-, and one-percent level, respectively.

Dep Var:	Green CAPEX				Non-Green CAPEX			
	More Constrained		Less Constrained		More Constrained		Less Constrained	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
$\widehat{\text{E-PRisk}}$	0.35^{*}		-0.21^{***}		-0.03		0.21^{***}	
	(1.94)		(-7.10)		(-0.06)		(3.87)	
E-PRisk		-0.02		-0.03^{***}		-0.87		0.05^{***}
		(-0.36)		(-3.43)		(-1.45)		(3.25)
Firm FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Country×Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Industry×Year FEs	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Other Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
N	1,515	1,670	1,513	1,663	1,515	1,670	1,513	1,663
Adjusted R^2	0.84	0.82	0.91	0.93	0.75	0.64	0.81	0.81

Table 8: High vs. Low Emission Firms
This table reports on the results of IV and OLS regressions for sub-samples split on firms' carbon emissions intensity. Sub-samples are determined by the median of lagged carbon emissions intensity (i.e., firms' CO2 emissions scaled by revenues) by year. Other controls (e.g., PRisk, Non-PRisk, firm size, etc.) consistent with the OLS regression described in Eq. (1) are omitted for presentation purposes. t-statistics in parentheses are computed from the variance-covariance matrix clustered by firm. *, **, and *** indicate statistical significance at the ten-, five-, and one-percent level, respectively.

Dep Var:	Green CAPEX				Non-Green CAPEX			
	More CO2		Less CO2		More CO2		Less CO2	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
$\widehat{\text{E-PRisk}}$	-0.30^{***}		0.19		0.47^{**}		-0.12	
	(-4.84)		(1.06)		(2.34)		(-0.28)	
E-PRisk		-0.04^{***}		-0.03		-0.07		0.18^{**}
		(-3.41)		(-1.19)		(-0.66)		(2.23)
Firm FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Country×Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Industry×Year FEs	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Other Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
N	1,406	1,529	1,132	1,288	1,406	1,529	1,132	1,288
Adjusted R^2	0.87	0.90	0.84	0.86	0.66	0.55	0.61	0.61

Table 9: Role of Institutional Ownership

This table reports on the results of IV and OLS regressions for sub-samples split on firms' institutional ownership. In Panel A (B), sub-samples are determined by the median of lagged Big-3 ownership, i.e., BlackRock, Vanguard, and State Street (UN PRI ownership i.e., signatories of the Principles for Responsible Investment) by year. Other controls (e.g., PRisk, Non-PRisk, firm size, etc.) consistent with the OLS regression described in Eq. (1) are omitted for presentation purposes. t-statistics in parentheses are computed from the variance-covariance matrix clustered by firm. *, **, and *** indicate statistical significance at the ten-, five-, and one-percent level, respectively.

Panel A: Big-3 Ownership

Dep Var:	Green CAPEX				Non-Green CAPEX			
	High Big-3 Own.		Low Big-3 Own.		High Big-3 Own.		Low Big-3 Own.	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
$\widehat{\text{E-PRisk}}$	-0.24^{***}		1.40		0.20^{***}		-7.20	
	(-5.12)		(0.66)		(3.13)		(-0.59)	
E-PRisk		-0.04^{***}		-0.02		0.05^{*}		-4.96^{**}
		(-2.59)		(-0.39)		(1.88)		(-2.45)
Firm FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Country×Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Industry×Year FEs	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Other Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
N	2,040	2,220	1,041	1,174	2,040	2,220	1,041	1,174
Adjusted R^2	0.79	0.83	0.89	0.93	0.57	0.58	0.70	0.61

Panel B: UN-PRI Ownership

Dep Var:	Green CAPEX				Non-Green CAPEX			
	High UN-PRI Own.		Low UN-PRI Own.		High UN-PRI Own.		Low UN-PRI Own.	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
$\widehat{\text{E-PRisk}}$	-0.23^{***}		0.84		0.22^{***}		2.86	
	(-4.82)		(0.65)		(2.87)		(0.45)	
E-PRisk		-0.05^{**}		0.04		0.05^{**}		-6.07^{**}
		(-2.50)		(0.72)		(2.15)		(-2.39)
Firm FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Country×Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Industry×Year FEs	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Other Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
N	2,080	2,270	1,001	1,124	2,080	2,270	1,001	1,124
Adjusted R^2	0.79	0.81	0.93	0.94	0.58	0.59	0.69	0.62

Table 10: Role of Country-level Social Norms

This table reports on the results of IV and OLS regressions for sub-samples split on country social norms of the firms domicile. In Panel A (B), sub-samples are determined by the median of lagged survey-based climate perception (climate worry) indices by year. Other controls (e.g., PRisk, Non-PRisk, firm size, etc.) consistent with the OLS regression described in Eq. (1) are omitted for presentation purposes. t-statistics in parentheses are computed from the variance-covariance matrix clustered by firm. *, **, and *** indicate statistical significance at the ten-, five-, and one-percent level, respectively.

Panel A: World Values ES Index

Dep Var:	Green CAPEX				Non-Green CAPEX			
	High WV-ES		Low WV-ES		High WV-ES		Low WV-ES	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
$\widehat{\text{E-PRisk}}$	0.47		-0.23^{***}		-0.16		0.22^{**}	
	(0.71)		(-3.88)		(-0.33)		(2.20)	
E-PRisk		-0.15^{**}		-0.04^{**}		0.19^{***}		-0.08
		(-2.04)		(-2.30)		(2.72)		(-0.94)
Firm FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Country×Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Industry×Year FEs	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Other Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
N	703	1,098	2,378	2,898	703	1,098	2,378	2,898
Adjusted R^2	0.56	0.63	0.91	0.53	0.78	0.73	0.71	0.76

Panel B: Yale Survey on Climate Worries

Dep Var:	Green CAPEX				Non-Green CAPEX			
	More Worried		Less Worried		More Worried		Less Worried	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
$\widehat{\text{E-PRisk}}$	-2.00		-0.26^{***}		-5.56		0.36^{**}	
	(-1.36)		(-3.31)		(-1.13)		(2.26)	
E-PRisk		-0.02		-0.06^{***}		-0.08		-0.03
		(-0.36)		(-3.02)		(-0.63)		(-0.28)
Firm FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Country×Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Industry×Year FEs	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Other Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
N	765	1,192	2,316	2,804	765	1,192	2,316	2,804
Adjusted R^2	0.89	0.88	0.74	0.41	0.70	0.64	0.74	0.76

Table 11: Role of Country-level Political Institutions
This table reports on the results of IV and OLS regressions for sub-samples split on country political norms of the firms domicile. In Panel A (B), sub-samples are determined by the median of lagged political stability (control of corruption) indices by year. Other controls (e.g., PRisk, Non-PRisk, firm size, etc.) consistent with the OLS regression described in Eq. (1) are omitted for presentation purposes. t-statistics in parentheses are computed from the variance-covariance matrix clustered by firm. *, **, and *** indicate statistical significance at the ten-, five-, and one-percent level, respectively.

Panel A: Political Stability

Dep Var:	Green CAPEX				Non-Green CAPEX			
	More Stable		Less Stable		More Stable		Less Stable	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
$\widehat{\text{E-PRisk}}$	0.04		-0.24^{***}		-0.35		0.25^{**}	
	(0.11)		(-3.89)		(-0.54)		(2.27)	
E-PRisk		-0.09^{*}		-0.06^{***}		0.06		-0.09
		(-1.77)		(-2.74)		(1.08)		(-0.74)
Firm FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Country×Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Industry×Year FEs	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Other Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
N	942	1,520	2,139	2,476	942	1,520	2,139	2,476
Adjusted R^2	0.79	0.74	0.92	0.49	0.77	0.81	0.73	0.76

Panel B: Control of Corruption

Dep Var:	Green CAPEX				Non-Green CAPEX			
	Less Corrupt		More Corrupt		Less Corrupt		More Corrupt	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
$\widehat{\text{E-PRisk}}$	0.34		-0.25^{***}		-0.19		0.25^{**}	
	(0.85)		(-3.64)		(-0.47)		(2.40)	
E-PRisk		-0.08		-0.05^{**}		0.11^{*}		-0.10
		(-1.42)		(-2.57)		(1.92)		(-0.91)
Firm FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Country×Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Industry×Year FEs	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Other Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
N	783	1,329	2,298	2,667	783	1,329	2,298	2,667
Adjusted R^2	0.66	0.66	0.91	0.52	0.82	0.85	0.72	0.76

Appendix for
"Green Corporate Investments and Environmental Political Uncertainty"

A.1 Variable Definitions

Investment Measures	
Total Green Investment$_{i,t}$	Firm i's total sustainable investment in year t.
Green CAPEX$_{i,t}$	Firm i's sustainable capital expenditure investment in year t.
Green R&D$_{i,t}$	Firm i's sustainable research and development investment in year t.
Total Non-Green Investment$_{i,t}$	Firm i's total non-sustainable investment in year t.
Non-Green CAPEX$_{i,t}$	Firm i's non-sustainable capital expenditure investment in year t.
Non-Green R&D$_{i,t}$	Firm i's non-sustainable research and development investment in year t.
Political Risk and Exposure Measures	
E-PRisk$_{i,t}$	Firm i's environmental political risk level in year t. The measure is constructed by Hassan et al. (2019) from firms' conference call transcripts based on a bag-of-words approach.
$\beta_{\text{E-PRisk},i,t}$	Firm i's environmental political risk beta in year t, estimated using 2-year rolling window regressions of E-PRisk on aggregate political risk as in Eq. (2).
PRisk$_{i,t}$	Firm i's overall political risk level in year t. The measure is constructed by Hassan et al. (2019) from firms' conference call transcripts based on a bag-of-words approach.
Non-PRisk$_{i,t}$	Firm i's overall non-political risk level in year t. The measure is constructed by Hassan et al. (2019) from firms' conference call transcripts based on a bag-of-words approach.
PSentiment$_{i,t}$	Firm i's overall political sentiment level in year t. The measure is constructed by Hassan et al. (2019) from firms' conference call transcripts based on a bag-of-words approach.
Non-PSentiment$_{i,t}$	Firm i's overall non-political sentiment level in year t. The measure is constructed by Hassan et al. (2019) from firms' conference call transcripts based on a bag-of-words approach.
Other Firm- and Country-level Variables	
CC Exposure$_{i,t}$	Firm i's climate change exposure in year t. The measure is constructed by Sautner et al. (2023) from firms' conference call transcripts based on a bag-of-words approach.
CC Sentiment$_{i,t}$	Firm i's climate change sentiment (positive minus negative words) in year t. The measure is constructed by Sautner et al. (2023) from firms' conference call transcripts based on a bag-of-words approach.
Market Capitalization$_{i,t}$	Firm i's market capitalization measured by shares outstanding times price in year t.

Market-to-Book$_{i,t}$	Firm i's market capitalization divided by book value of assets in year t.
ROA$_{i,t}$	Firm i's return on assets measured as net income divided by total assets in year t.
Cash Constrained$_{i,t}$	An indicator for if firm i is cash constrained in year t.
Total Debt Ratio$_{i,t}$	Firm i's ratio of total debt to total assets in year t.
Domestic Ownership$_{i,t}$	Firm i's institutional ownership from domestic investors in year t.
Foreign Ownership$_{i,t}$	Firm i's institutional ownership from foreign investors in year t.
Return SD$_{i,t}$	Firm i's return standard deviation in year t.
ESG Score$_{i,t}$	Firm i's ESG score in year t.
Disasters$_{c,t}$	The number of country-level disasters that hit the headquarter country of domicile for firm i in year t.
Disaster Damages$_{c,t}$	The damages of country-level disasters that hit the headquarter country of domicile for firm i in year t.
ESG Score$_{i,t}$	Firm i's ESG score in year t.
Re-deployability$_{i,t}$	The industry-level asset re-deployability score from Kim and Kung (2017) in year t.
SA Index$_{i,t}$	The Size-Age index for financial constraints constructed following Hadlock and Pierce (2010) in year t.
COS Intensity$_{i,t}$	Firm i's total CO2 emissions scaled by revenues in year t.
Big-3 Ownership$_{i,t}$	Firm i's percentage institutional ownership from BlackRock, Vanguard, and State Street in year t.
UN PRI Ownership$_{i,t}$	Firm i's percentage institutional ownership from investors who are signatories on the United Nations Principles of Responsible Investment in year t.
Control of Corruption Index$_{i,t}$	Firm i's control of corruption index based on its headquarter country of domicile in year t.
Political Stability$_{i,t}$	Firm i's political stability index based on its headquarter country of domicile in year t.
World Values ES Index$_{i,t}$	Firm i's World Values ES index based on its headquarter country of domicile in year t.
Climate Worries Index$_{i,t}$	Firm i's climate worries index based on its headquarter country of domicile in year t.

A2.Corporate Statements on Sustainable Investments

Below, we present several examples of corporate statements regarding their sustainable investments, as found in their recent annual reports and news articles.

- **ROCKWOOL Group**: ROCKWOOL's 2022 Annual Report underscores its dedication to decarbonization: "We continue investing in developing new and improved technologies to ensure we meet our ambitious decarbonisation goals."
- **Microsoft Corporation**: "Microsoft is investing in carbon removal technologies to achieve negative emissions by 2030."
- **IKEA**: "IKEA has committed to significant investments aimed at reducing its carbon footprint, achieving a 30.1% reduction in emissions since 2016."
- **Siemens AG**: "Siemens is committed to achieving carbon neutrality by 2030. Our investments in energy-efficient technologies and renewable energy sources are pivotal to this goal."
- **Lockheed Martin Corporations**: "We invested $3.4 billion in Independent Research and Development and capital investments to accelerate the capabilities that our customers need and for our operations to meet those needs."
- **Nordic Investment Bank (NIB)**: "R&D investments (EUR 477 million, 14%), green buildings (EUR 363 million, 10%), and energy generation (EUR 357 million, 10%). This will allow for the integration of more renewables, the mass deployment of sustainable mobility, and the creation of cleaner, more efficient energy systems."
- **Metso Outotec**: "Our investments in sustainable technologies aim to improve energy efficiency and reduce emissions in the minerals processing industry."
- **American Water Works Company**: "Investing in sustainable water management ensures we provide safe, clean, and reliable water services for future generations."
- **AGL Energy**: "AGL has invested significantly in grid-scale batteries, renewables, and enhancing flexibility in their existing thermal units to address the challenges and opportunities of Australia's energy transition."
- **Regenerative Agriculture Principles**: "We are working with farmers to adopt regenerative agriculture practices, which improve soil health, enhance biodiversity, and sequester carbon."
- **H&M**: "H&M has invested in recycled polyester firm Syre, aiming to create scalable, recyclable polyester for H&M and the wider fashion industry.
- **Apple**: "Apple has committed to reducing their greenhouse gas emissions by 2030, investing more into renewable energy and integrating sustainability into their core operations.
- **Intel**: "Intel has been investing in reducing its manufacturing environmental footprint for over two decades. We aim to achieve net-zero greenhouse gas emissions for Scopes 1 and 2 by 2040 and have already achieved 99% renewable electricity usage globally."
- **Walmart**: "Walmart aims to achieve zero emissions by 2040, investing in renewable energy and sustainable practices across our supply chain."
- **Tesla Inc.**: "Tesla's mission is to accelerate the world's transition to sustainable energy through investing in electric vehicles and renewable energy products."

IA.1 Internet Appendix Tables

Table IA.1: Full Table: Environmental Political Risk and Investment

This table reports the full set of variable coefficients for Table 3 of the main paper. t-statistics in parentheses are computed from the variance-covariance matrix clustered by firm. *, **, and *** indicate statistical significance at the ten-, five-, and one-percent level, respectively.

	Green				Non-Green			
Dep Var:	Total Investment		CAPEX	R&D	Total Investment		CAPEX	R&D
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
E-PRisk	−0.05**	−0.06***	−0.003*	−0.02	−0.08	−0.06	−0.03	−0.03
	(−2.57)	(−2.64)	(−1.91)	(−1.00)	(−0.61)	(−0.74)	(−0.43)	(−0.51)
PRisk	3.28	3.26	−0.17	0.46	0.41	0.86	4.64	−3.78
	(1.46)	(1.46)	(−0.88)	(0.34)	(0.03)	(0.08)	(0.51)	(−0.76)
Non-PRisk	0.24	−0.23	0.05	0.44	−0.74	−2.31	−5.92*	3.61
	(0.35)	(−0.31)	(1.11)	(1.22)	(−0.21)	(−0.56)	(−1.67)	(1.57)
PSentiment		0.76	0.02	0.04		4.28	4.29	−0.004
		(1.44)	(0.69)	(0.18)		(0.92)	(0.93)	(−0.004)
Non-PSentiment		−0.06	0.0001	−0.06		0.74*	0.82**	−0.07
		(−0.87)	(0.04)	(−0.98)		(1.83)	(2.11)	(−0.59)
CC Exposure		−0.61	0.02	−0.41		−5.03	−6.71*	1.67
		(−1.20)	(0.75)	(−1.35)		(−1.14)	(−1.89)	(0.63)
CC Sentiment		0.02	0.02	0.41		20.14***	11.80**	8.34*
		(0.01)	(0.33)	(0.92)		(2.64)	(2.02)	(1.71)
Log(MCAP)		4.55	0.09	1.47		5.15	18.18*	−13.02
		(0.84)	(0.57)	(0.30)		(0.38)	(1.78)	(−1.46)
Log(MB)		−6.55	−0.10	−8.13		−19.12	−26.29	7.17
		(−1.04)	(−0.60)	(−1.44)		(−0.97)	(−1.50)	(0.85)
ROA		−25.65	0.26	−0.75		−170.99	−122.77	−48.22
		(−0.70)	(0.66)	(−0.02)		(−1.43)	(−1.29)	(−1.23)
Cash Constrained		−14.92	−0.04	−10.63		−6.57	0.15	−6.72
		(−1.21)	(−0.16)	(−0.87)		(−0.38)	(0.01)	(−0.53)
Debt Ratio		−47.38*	−0.91	−36.83		22.53	47.97	−25.44
		(−1.73)	(−0.94)	(−1.31)		(0.48)	(1.39)	(−0.81)
Domestic Ownership		0.05	−0.03*	−0.09		−0.70	0.38	−1.07
		(0.38)	(−1.79)	(−1.01)		(−0.70)	(0.76)	(−1.30)
Foreign Ownership		−0.10	0.01	−0.01		−0.54	−0.05	−0.50
		(−0.65)	(0.49)	(−0.13)		(−0.53)	(−0.08)	(−0.67)
SD(Ret)		16.04*	0.35	11.64		34.84	48.11*	−13.26
		(1.70)	(0.86)	(1.25)		(1.16)	(1.83)	(−0.89)
ESG Score		0.14	0.002	0.33		−0.26	0.13	−0.39
		(0.42)	(0.19)	(1.04)		(−0.27)	(0.27)	(−0.47)
Firm FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Country X Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Industry X Year FEs	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
N	4,570	3,996	2,066	3,996	4,570	3,996	3,996	3,996
Adjusted R^2	0.23	0.22	0.76	−0.06	0.52	0.71	0.76	0.24

Table IA.2: Robustness: Controlling for other Political Risk Topics
This table reports the results of the second-stage IV regressions controlling for other political risk topics. *t*-statistics in parentheses are computed from the variance-covariance matrix clustered by firm. *, **, and *** indicate statistical significance at the ten-, five-, and one-percent level, respectively.

Dep Var:	Green CAPEX							
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
$\widehat{\text{E-PRisk}}$	-0.23^{***}	-0.21^{***}	-0.27^{***}	-0.34^{*}	-0.25^{***}	-0.22^{***}	-0.29^{**}	-0.40^{*}
	(-3.05)	(-3.20)	(-2.86)	(-1.77)	(-3.20)	(-3.15)	(-2.21)	(-1.88)
Economic PRisk	0.32							
	(1.59)							
Trade PRisk		0.02						
		(0.78)						
Institutions PRisk			0.45					
			(1.44)					
Health PRisk				0.51				
				(0.95)				
Security PRisk					0.33^{*}			
					(1.83)			
Tax PRisk						0.11^{*}		
						(1.67)		
Technology PRisk							0.79	
							(1.11)	
Residual PRisk								-41.33
								(-1.18)
Firm FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Country×Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Industry×Year FEs	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Other Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
N	3,113	3,113	3,113	3,113	3,113	3,113	3,113	3,113
Adjusted R^2	0.89	0.89	0.88	0.88	0.88	0.89	0.88	0.87