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Stock Market Reactions to Climate Risk Events: A Systematic Literature Review and Research Agenda

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ABSTRACT

As global warming intensifies, climate risks' impact on firm value has become a critical concern for academia and investors. This systematic literature review analyzes 50 event studies in this research field, classifying them by climate risk type. The analysis indicates that physical risk events predominantly result in negative abnormal stock returns for affected firms, whereas transition risk events tend to penalize the stock prices of carbon-intensive firms and reward those of low-carbon ones. The review's findings emphasize the role of investor overreaction, driven by salience bias, as a significant factor beyond traditional market efficiency considerations. Four propositions are derived, and eight research opportunities to address gaps in the understanding of stock market reactions to climate risk events are identified. This review encourages investors and firms alike to enhance climate risk management and advances research by synthesizing the current field through a theory-guided organizing framework that considers a range of factors influencing investor responses to salient climate risks.

1 | Introduction

The impact of climate risks on firm value has become a prominent topic in climate finance research and the stock market. The rising global mean temperature and the increasing frequency and severity of extreme weather events are attracting societal attention (Ramelli et al. 2021), prompting countries to increasingly adopt national and international policies to meet the Paris Agreement targets for combating global warming (Pham et al. 2019). Consequently, investor interest in understanding the effects that these regulatory changes, rising temperatures, and extreme weather events have on firm value is growing (Stroebel and Wurgler 2021).

Climate risks have already begun to be reflected in firm value and, increasingly, researchers aim to understand whether and how investors integrate these risks into their investment decisions (Krueger et al. 2020). Many investors underestimate climate risks and thus do not manage them properly (Stroebel and Wurgler 2021), possibly because of the challenges they face in identifying and measuring their impact (Bua et al. 2024). Accordingly, the stock market seems to be inefficient in its corresponding pricing of climate risks (Liesen 2015), and investors believe that climate risks are insufficiently reflected in stock prices (Bauer et al. 2024).

This systematic literature review is the first to examine the immediate effects of multiple climate risk types on the stock market. Kathiravan et al. (2021) conducted a systematic review on how weather factors such as temperature, cloud cover, and rainfall influence stock market behavior, highlighting the role of investor sentiment in financial decision making. Our review expands on this behavioral finance perspective by moving beyond weather-induced mood effects to analyze how distinct climate risk types—physical and transition—systematically affect stock prices through event study evidence. Bouzzine (2021) provided a systematic literature review of stock price reactions to environmental pollution events, showing how markets respond to discrete pollution-related shocks. Our review complements this work by shifting the scope from localized environmental accidents to global climate risk events, thereby capturing both physical and transition risks that are systemic in nature. Venturini (2022) reviewed how climate change can be treated as an additional source of market *risk*, synthesizing evidence on how physical and transition risks affect asset pricing through both top-down and bottom-up approaches. Our approach establishes an extended perspective on how climate risks are incorporated into firm value (risk *and* return) by isolating the immediate market consequences of physical and transition risks in event study evidence. Zhou et al. (2023) reviewed the impacts of natural disasters and physical climate risks on the financial sector, synthesizing evidence on banking, insurance, stock and bond markets, and international capital flows. Our review substantiates this macro-level perspective by zooming into firm-level event studies. Lastly, Comite et al. (2025) conducted a systematic literature review on accounting for climate change, tracing how research agendas and influential actors shifted after milestones such as the Paris Agreement and the EU Green Deal. Our review concretizes this narrative inquiry by reviewing the empirical evidence on how the climate risks that are debated in academic and professional accounting circles are actually priced in stock markets.

Previous empirical research has primarily focused on climate risks in the context of asset pricing models, and a prominent debate in this field revolves around whether investing in green stocks yields positive returns for investors in the long run (Pástor et al. 2021). While this is a significant concern for long-term investors, the short-term effects of climate risk drivers remain underexamined.

Event studies that investigate stock market reactions to climate risks can be grouped according to the two distinct climate-related risk drivers: *physical climate risks* and *climate transition risks* (Venturini 2022). *Physical risks* can be subdivided into acute and chronic risks. *Transition risks* arise from the required (economic) adjustments for moving towards decarbonization (ECB 2020). Transition risks are recognized as major climate risks in the short term, whereas physical ones are expected to be dominant in the long term (Krueger et al. 2020; Stroebel and Wurgler 2021).

As the impact of climate risks on the stock market increases, how investors will react to them remains an open question. To address this, we review the literature in this emerging research field and pose the following research question: *How do investors react to climate-related events, categorized into physical and transition risks?* By posing this research question, we aim to identify patterns in stock price reactions and to determine whether certain portfolios are preferred. Furthermore, we seek to reveal whether there is a difference in reactions to the various types of climate risk.

Our multistep search process resulted in a final sample of 50 event studies, which we categorize by climate risk type and factors influencing stock market reactions. Over the last 5 years, the number of studies per year has been steadily increasing, with most focusing on transition risks. Physical risk events tend to lead to negative stock market reactions for firms in the affected region. In terms of market reactions to transition risks, increasing climate policies and regulations tend to lead to the penalization of *brown stocks* and the remuneration of *green stocks*. The reviewed studies distinguish between green and brown stocks by industry affiliation and/or firms' individual environmental responsibility.

This systematic literature review examines the short-term effects of climate risks on stock markets, offering valuable insights for both academia and practitioners. We present the first systematic literature review in this young research field, filling a gap in our understanding of investor behavior in response to salient climate risks. We contribute to research by analyzing the research field through our theory-guided organizing framework for investor reactions to climate risk events, deriving four propositions, and proposing eight avenues for future research. Investors and firm managers may recognize the negative implications of climate risks for stock prices and the corresponding need to hedge firms' exposure to climate risks. Investors can leverage the synthesized findings, which show the short-term outperformance of green stocks and underperformance of brown stocks during transition risk events, to develop effective investment strategies. However, strategies for hedging against physical risks, such as extreme weather events, remain an unresolved challenge.

2 | Theoretical Foundations

2.1 | Event Study Methodology: How to Measure Investor Response

The event study methodology is a suitable method for measuring stock price reactions to climate risk events. Event studies enable the quantification of the importance investors place on individual pieces of climate change information (Venturini 2022). Climate risk events have a macroeconomic character because they can impact entire industries and markets. To measure short-term investor reactions to climate risk events, researchers can apply the event study methodology as proposed by MacKinlay (1997). This typically involves the following steps: (1) defining events, event windows, and portfolios; (2) estimating normal returns; (3) calculating abnormal returns; (4) testing the portfolios for statistical significance with parametric and nonparametric tests; and (5) conducting multivariate regression analyses.

First, researchers conducting event studies need to define events of interest and the corresponding event date. The time window around the event date should include the period of the strongest attention to this particular event. Event windows should be as short as possible to reduce the risk of confounding events (McWilliams and Siegel 1997). By applying multiple event windows to detect potential anticipation, direct, or lagged effects, researchers can ascertain whether investor reactions are more likely driven by new information or by surrounding media or public attention (Schuster et al. 2023). Portfolios can be constructed based on stock indices, with firms categorized, for example, by corporate environmental performance grades or industry affiliation (Birindelli and Chiappini 2021).

Second, researchers need to compute the normal returns using either a multifactor model, such as the three-factor model (Fama and French 1992), or the market model, which assumes a linear relationship between the respective stock returns and the market return (Brown and Warner 1980). Normal returns are the expected returns assumed to occur in the absence of the event. Multifactor models are more effective at mitigating the potential correlation of abnormal returns caused by industry commonality, especially in small samples. Model coefficients are estimated from the estimation window, which should conclude at least 20 days prior to the event dates to ensure that the event remains unanticipated (MacKinlay 1997).

Third, to evaluate whether a climate risk event has a significant impact on stock returns or causes certain investor behavior, researchers need to calculate the daily abnormal returns for each firm as the residual between the estimated and actual stock returns. Thereafter, the daily abnormal returns need to be accumulated for the event windows for each firm to produce cumulative abnormal returns (MacKinlay 1997).

Fourth, researchers can test the statistical significance of the impact of climate risk events by performing parametric tests on the cumulative abnormal returns. To evaluate the average effect of climate risk events on portfolios, the mean of the stocks' cumulative abnormal returns can be computed. For robustness checks, researchers should consider nonparametric tests such as those by Wilcoxon (1992) or Kolari and Pynnonen (2011). Statistically significant cumulative abnormal portfolio returns indicate that climate risk events had a corresponding positive or negative effect on the respective stock portfolios.

Fifth, researchers can investigate the determinants of the direction and magnitude of stock market reactions to climate risk events in greater detail by conducting additional multivariate regression analyses based on firms' abnormal returns (Jain 1982). This allows the verification of the effects of portfolio clustering based on industry affiliation or environmental performance by regressing abnormal returns on the respective variables.

2.2 | Climate Risk Events: A Taxonomy

Climate risks entail physical risks and transition risks (Figure 1) (Gambhir et al. 2021; Venturini 2022). Physical risks arise from climate-related events (or *weather-related* as climate's short-term state) that damage assets, disrupt operations, or impair supply chains (Liu et al. 2023). These physical risks unfold as *acute* physical risks and *chronic* physical risks. Chronic physical risks include phenomena such as rising global mean temperature and sea-level rise. Acute physical risks encompass extreme weather events such as heatwaves, extreme rain, and storms, along with their consequences, such as droughts, flooding, and wildfires (ECB 2020; Venturini 2022). The growing threats from physical risks have intensified the demand for a low-carbon transition, which in turn creates climate transition risks.

Climate transition risks entail all risks related to the policy changes, technological innovations, and shifts in consumer and investor preferences that arise from efforts to mitigate climate change (Bua et al. 2024; Venturini 2022). First, climate policies aim to decrease greenhouse gas emissions in an attempt to reach the net-zero target of the Paris Agreement (Venturini 2022).

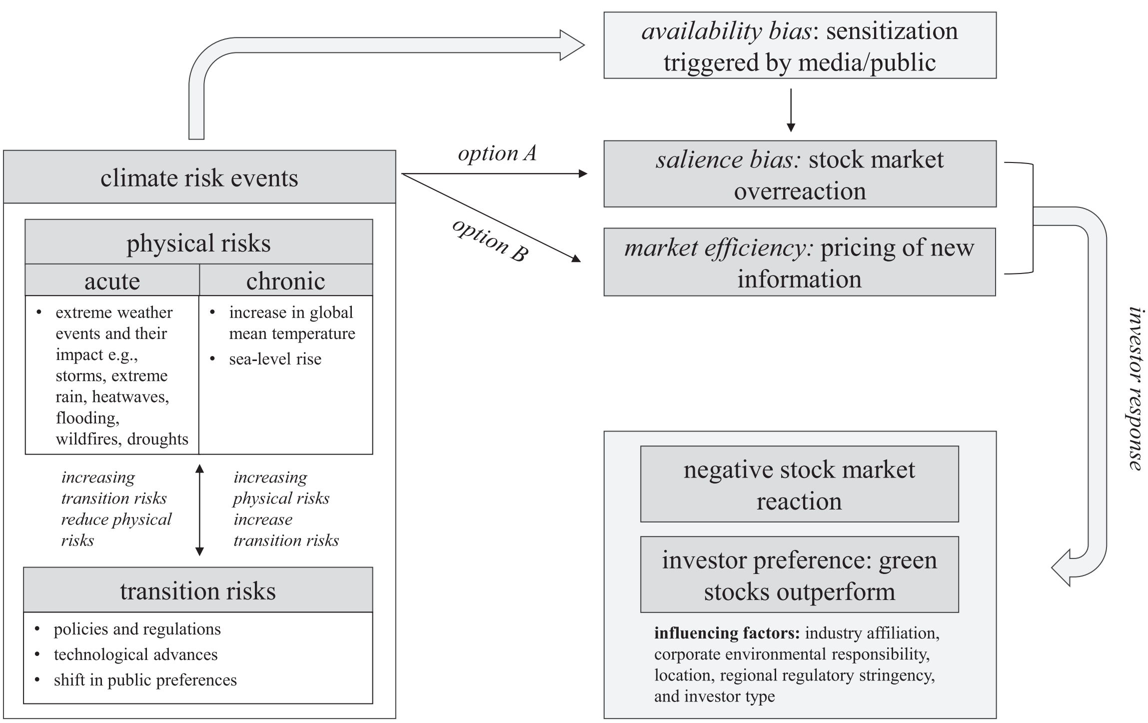

FIGURE 1 | Theory-guided organizing framework. This figure illustrates the theoretical framework that structures the effects of different climate risk events on investors. It highlights two core mechanisms: negative stock market reactions and the relative outperformance of green stocks. The framework further incorporates the role of media and public attention, showing that investor responses can arise from salience bias and/or the incorporation of new information. The framework also includes five additional factors influencing stock market reactions to climate risk events.

Effective mitigation policies could significantly raise industry and consumer prices for high-carbon products and could directly restrict their sale (Semieniuk et al. 2021; Venturini 2022). Second, technological advances include cost-saving innovations contributing to making fossil fuels obsolete. Third, preference changes may lead to consumers/investors demanding sustainable products/assets (Semieniuk et al. 2021; Venturini 2022). In turn, increasing transition risks may mitigate physical risk, highlighting their interplay (Bua et al. 2024).

2.3 | Asset Pricing Mechanisms: How Climate Risk Affects Stock Returns

The extant event study literature on climate risk draws on two main schools of thought to explain stock market reactions (Figure 1): a behavioral finance perspective emphasizing salience bias (Option A), and a neoclassical perspective grounded in the efficient market hypothesis (Option B).

The semistrong form of the efficient market hypothesis (Option B) holds that stock prices adjust without delay to all publicly available information (Fama 1991). Contemporary valuation models define firm value as the present value of expected future distributions to shareholders—alternatively cash flows, economic profit, or dividends—discounted to present values at a rate that reflects risk (Wahlen et al. 2022). New disclosures of physical or transition risks cause investors to reassess expected cash flows and discount rates, which in turn lowers firm valuations and stock prices. A further explanation for muted stock price responses is that firms highly exposed to physical risks may have already incorporated these risks into their valuations, leaving less room for additional market adjustments.

Climate risk events may convey new information that is incorporated by investors in their stock valuations (Griffin et al. 2019). For instance, Bolton and Kacperczyk (2021) and Ilhan et al. (2021) highlight that carbon-intensive stocks have higher returns because investors demand compensation for holding the carbon risk. Pástor et al. (2021) explain that investors derive nonpecuniary utility from sustainability, leading to them accepting lower returns for green preferences. This consideration confirms that green stock returns should be lower than those of brown stocks in equilibrium (Pástor et al. 2021). Besides the nonpecuniary reasons, investors accept lower returns as a trade-off for hedging stock values against increasing climate change risks (Engle et al. 2020).

The alternative line of reasoning draws on behavioral finance (Option A in Figure 1). It argues that investor reactions are shaped less by rational valuation and more by cognitive biases, particularly the salience bias. Salience bias lets individuals assign disproportionate weight to vivid, prominent, or attention-grabbing information in their decisions, even if that information is not a most reliable indicator of preceding risk or eventual outcome (Ge et al. 2024). Bordalo et al. (2012) suggest that investors tend to focus on the most prominent aspects of a situation, particularly those that stand out from the norm.[1] This way, salience bias may lead to stock market overreactions (underreactions) during periods of high (low) media and public attention to risky events that carry new information (Figure 1).

Both theoretical perspectives converge on two broad predictions (Figure 1, bottom right). First, climate risk events trigger negative market reactions because they increase perceived uncertainty and risk exposure (Fama 1991). Complementarily, public attention to climate change leads to investor overreaction and short-term price declines (Ge et al. 2024; Huynh and Xia 2023). Second, green stocks tend to outperform brown stocks during such periods. This effect can be argued either as neoclassical, rational hedging against climate risk (Engle et al. 2020; Li et al. 2021), or investor preference for sustainability under heightened salience (Choi et al. 2020; Pástor et al. 2021). Green firms gain relative value when climate concerns dominate the media (Ardia et al. 2023; Huynh and Xia 2023). While magnitudes vary across fuzzy physical and concise transition risks (Bua et al. 2024)—rises in transition (physical) risks are associated with increases (decreases) in green (brown) stock returns—the theoretical expectation remains consistent: Climate risk events depress overall market value while strengthening the relative position of green firms. In detail, the proposed investor response may be influenced by various factors beyond the characteristics of the climate risk event, as well as media and public attention. These additional factors include industry affiliation (Antoniuk and Leirvik 2021), corporate environmental responsibility (Schuster et al. 2023), location (Bourdeau-Brien and Kryzanowski 2017), regional regulatory stringency (Birindelli et al. 2023), and investor type (e.g., institutional vs. retail, short-term vs. long-term) (Blanco et al. 2024).

Thereby, this review develops a theory-guided organizing framework that draws on both efficient market and behavioral finance perspectives to structure event-study evidence on climate risks. The framework disciplines interpretation by showing how identical climate events generate different stock market reactions, depending on assumptions about valuation updates (efficient market hypothesis) and investor attention (salience). Its scope is limited to short-term stock market responses identified in event studies and does not extend to a general theory of climate finance.

3 | Methodology and Sample Selection

This systematic literature review encompasses event studies focusing on stock market reactions to climate risk events. As previously defined, climate risk events are events associated with physical or transition risks. Event studies are designed to capture short-term investor reactions. However, climate-related risks tend to materialize over extended periods, especially physical risks. As highlighted by Bouzzine (2021), employing multiple event windows or multievent designs (e.g., Bouzzine and Lueg 2020) can address potential information leakage, anticipation, or reinforcement effects but raise the challenge of confounding events. As suggested later in this review, this methodological trade-off also helps understand why transition risks—which typically manifest as sudden regulatory or policy shocks—yield more consistent results in event studies than physical risks, whose impacts are more diffuse and gradual.

In conducting this systematic literature review, we followed transparency and reproducibility criteria aligned with the Preferred Reporting Items for Systematic Reviews and

Meta-Analyses (PRISMA) framework (Page et al. 2021). The sample selection process is based on five distinct steps. The cut-off date for the database search is June 20, 2024.

First, we searched the Scopus and Web of Science databases. We did not restrict the search to a specific timeframe in order to ensure high output. Our broad search string is based on the definition of climate risk events outlined in Section 2.2.[2] The initial output consisted of $N = 1057$ studies.

Second, we removed duplicates resulting in $n = 825$ studies.

Third, to guarantee that the studies were published in a reputable journal, we limited ourselves to the Academic Journal Guide (AJG) from 2021. The UK-based Chartered Association of Business Schools (CABS) updates the AJG every 3 years through a transparent, field-based review process in which leading subject experts evaluate journals on quality and rigor. In contrast to citation-driven lists that mainly reflect popularity, the AJG provides quality control by emphasizing scholarly contribution and methodological robustness. Covering over 1700 journals across business, economics, sociology, and related fields, it also ensures interdisciplinarity while maintaining a consistent benchmark of research quality. Restricting our sample to AJG-ranked journals therefore balances inclusivity with the assurance that the studies reviewed meet the academic standards that the CABS describes in its explanatory guide. All rated journals (1, 2, 3, 4, or 4*) were eligible for inclusion. After this selection step, the sample resulted in $n = 432$ studies.

Fourth, we screened the abstracts of the 432 studies to evaluate whether they focused on climate risk-related macro events measuring stock price reactions using event study methodology (MacKinlay 1997). Studies on earthquakes, which are not primarily linked to climate change (Fan et al. 2021), and those on weather mood (Saunders 1993) rather than climate shocks were excluded. After this step, the sample comprised $n = 41$ studies.

Fifth, we followed the ancestor search approach (Atkinson et al. 2015), i.e., checking the references of the included studies for further relevant literature: This identified an additional nine studies which were also published in AJG-ranked journals but had not been included in the original dataset. This resulted in a final sample of $n = 50$ studies.

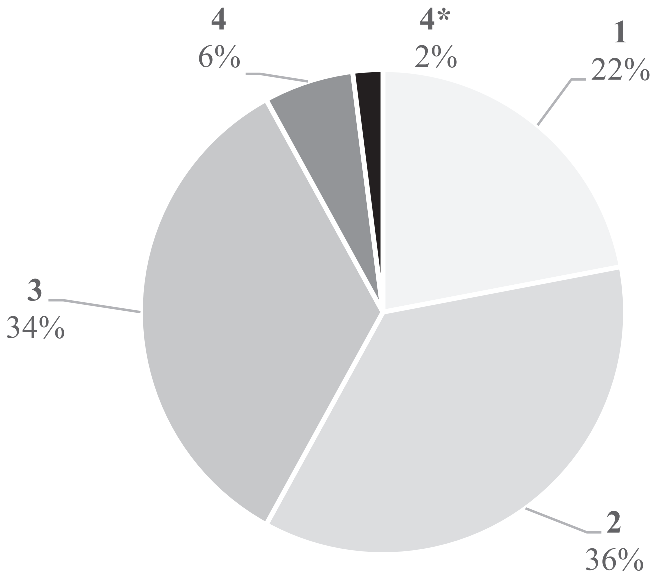

FIGURE 2 | AJG 2021 journal rating. This chart shows the distribution of journal ratings according to the AJG 2021. The ratings range from 1 to 4*, with 4* indicating the highest quality journals.

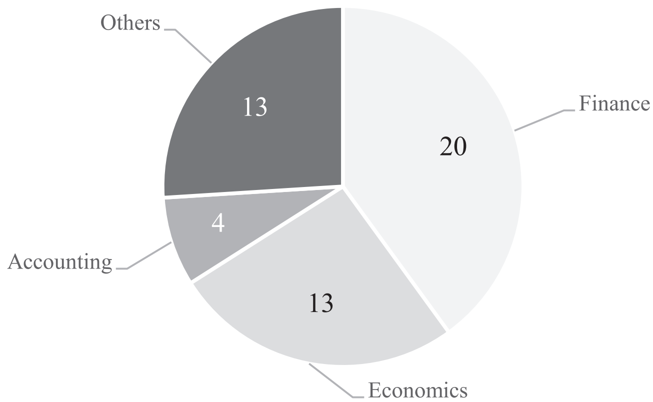

FIGURE 3 | Journal research fields. This chart shows the distribution of journal fields according to the AJG 2021. Research fields with more than three studies are listed individually, while the remaining fields are grouped together under "Others."

4 | Results

4.1 | Bibliometric Analysis

Figures 2–5 and Tables 1–2 present the bibliometric analysis of the studies. Figure 2 shows that the majority of journals included in the systematic literature review have AJG ratings of 1 or 2. Only 8% have a rating of 4 or 4*. Figure 3 reveals that most of the journals included in the review are from the research fields of finance (20 studies), economics (13 studies), and accounting (4 studies), representing approximately 75% of the total. Although event studies are predominantly conducted in these disciplines, the sample reveals a lack of studies in sustainability fields. Figure 4 shows that the study samples predominantly focus on Europe (14 studies) and the US (11 studies). This geographic concentration reflects institutional environments in which climate risks are more likely to translate into observable stock market reactions, given stronger regulatory frameworks, higher disclosure requirements, and greater investor attention to climate-related information. One-quarter of all studies investigate global stock portfolios (12 studies). Other regions include China (5 studies) and Australia (4 studies). Figure 5 shows the annual and cumulative publications of the final sample, categorized by climate risk type. Only two studies were published before 2011, confirming the newness of this research field. Since 2019, the number of studies published each year has increased significantly, peaking at 14 studies in 2023. The trend suggests a further increase in the coming years. Most studies investigate transition risks. Interestingly, transition risks have only been investigated since 2013, indicating that the transition to a low-carbon economy is an even more recent topic (for transition risk drivers, see Figure 1).

Table 1 lists the journals with a minimum of two studies. Only the *International Review of Financial Analysis* (4 studies) and *Applied Economics* (3) have more than two studies in the final sample of this systematic literature review, indicating that journal concentration is limited. Table 2 presents authors with more than one publication in the final sample, including the number of studies and respective citations. Vikash Ramiah leads with five published studies and the highest number of citations.

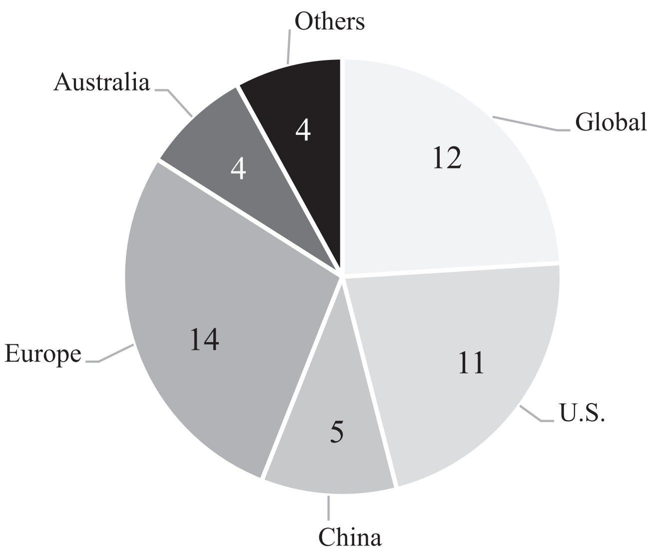

FIGURE 4 | Sample origins by region. This chart shows the distribution of regions among the studies included in the final sample.

4.2 | Content Analysis

The content analysis identifies systematic patterns in stock market reactions to climate risk events according to our theory-guided organizing framework developed in Section 2.3. A *valuation mechanism* grounded in the efficient market hypothesis explains reactions through revisions of expected cash flows and discount rates, whereas a *salience mechanism* explains reactions through attention-driven amplification of perceived risk (Fama 1991; Bordalo et al. 2012; Pástor et al. 2021). These mechanisms structure the synthesis by explaining why transition risk events generate sharper and more differentiated abnormal returns than physical risk events, and why portfolio differentiation between green and brown firms conditions statistical significance. The analysis groups studies by climate risk type because risk type determines the dominant pricing mechanism operating in capital markets. Tables 3–5 summarize the underlying evidence by mapping portfolio structures, event types, and observed stock market reactions across transition, physical, and mixed climate risks. Geographic context conditions both valuation and salience mechanisms, as differences in regulatory credibility, media intensity, and capital market structure shape whether climate-related events are perceived as economically relevant and trigger investor responses.

4.2.1 | Transition Risks: How Shareholder Value Shifts From Brown Stocks to Green Stocks

Transition risk studies display comparatively strong and systematic abnormal returns because policy and regulatory

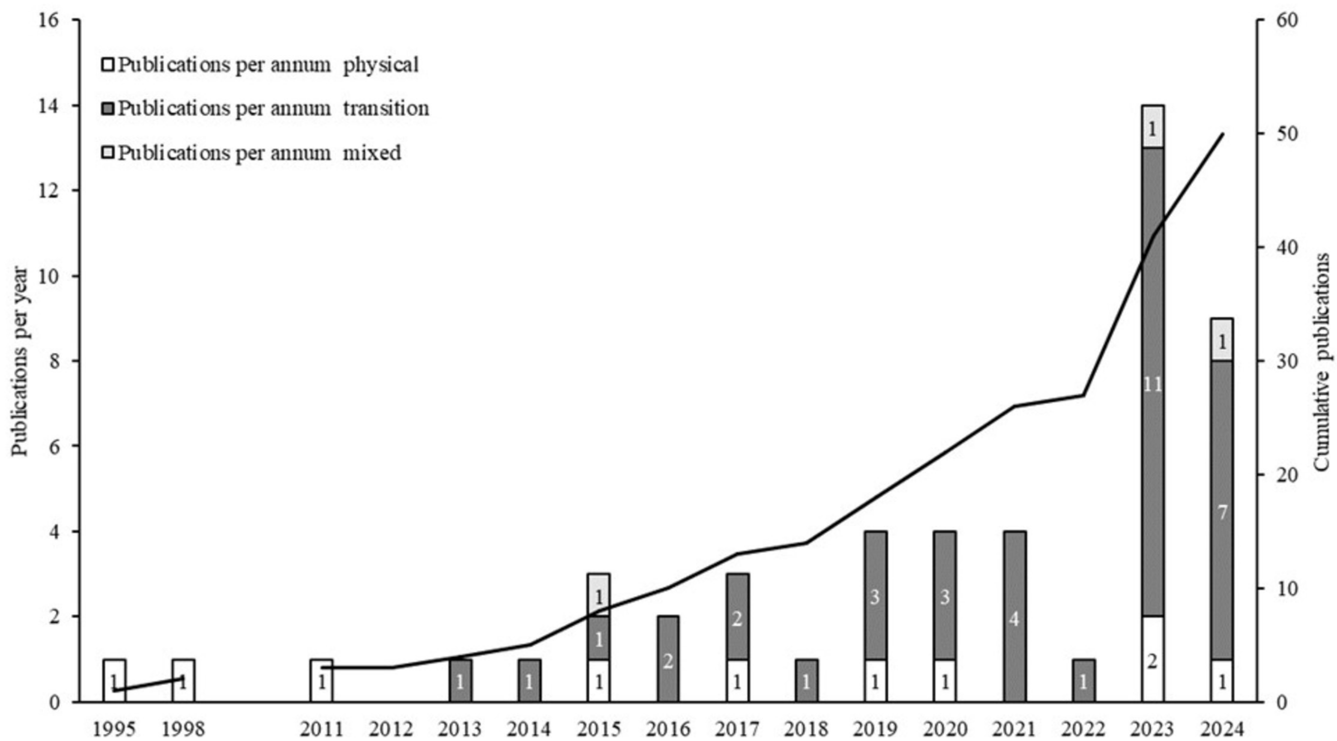

FIGURE 5 | Studies per year and risk type. This diagram shows the annual and cumulative distribution of studies in the final sample, categorized by climate risk type: physical risks, transition risks, or mixed risks (including both transition and physical risks). The line is interrupted because of no relevant studies being published between 1996 and 2011.

TABLE 1 | Journals with a minimum of two studies.

Journal	Studies	Citations	AJG rating 2021
International Review of Financial Analysis	4	127	3
Applied Economics	3	110	2
Energy Economics	2	189	3
Corporate Social Responsibility and Environmental Management	2	95	1
Journal of Corporate Finance	2	85	4
Pacific Basin Finance Journal	2	70	2
Journal of Cleaner Production	2	58	2
Accounting & Finance	2	47	2
Finance Research Letters	2	41	2

Note: This table shows the ranking of journals that have a minimum of two studies included in the final sample, along with their cumulative citations (reference date: September 17, 2024; retrieved from Google Scholar) and AJG 2021 journal rating.

TABLE 2 | Authors with a minimum of two studies.

Author	Affiliation	Studies	Citations
Vikash Ramiah	University of Wollongong	5	427
Imad Moosa	University of South Australia	4	376
Vineeta Kumari	Magadh University	3	25
Dharen Kumar Pandey	Magadh University	3	22
Reinhold P. Lamb	University of North Florida	2	275
Le Luo	University of Newcastle	2	135
Huy Pham	Ton Duc Thang University	2	116
Elisa Ossola	European Commission	2	95
Giuliana Birindelli	University of Pisa	2	82
Yajie Chen	Southwestern University of Finance and Economics	2	41
Mario Schuster	Leuphana University Lüneburg	2	8
Rainer Lueg	Leuphana University Lüneburg	2	8
Sophie Constance Bornhöft	Leuphana University Lüneburg	2	8
Yassin Denis Bouzzine	Leuphana University Lüneburg	2	8

Note: This table shows the ranking of authors with a minimum of two studies included in the final sample, along with their cumulative citations (reference date: September 17, 2024; retrieved from Google Scholar).

events constitute discrete information shocks that directly affect expected cash flows and discount rates, while portfolio construction (green vs. brown) conditions statistical significance. The evidence reviewed below should therefore be read as valuation-driven repricing amplified by salience, with heterogeneity arising primarily from differences in regulatory stringency, portfolio definitions, and investor composition.

The base expectation in the transition risk literature is that climate policy and regulatory announcements depress stock returns by increasing perceived risk and required discount rates. This cluster of transition risk studies confirms negative market reactions to transition risk events, particularly for carbon-intensive industries, relying on comparable event definitions and valuation-based abnormal return models (Alessi et al. 2023; Birindelli and Chiappini 2021; Cho et al. 2024; Diaz-Rainey et al. 2021; Han et al. 2019; Harrison et al. 2024; Luo and Tang 2014; Mueller et al. 2023; Qian et al. 2020; Ramiah et al. 2013; Ramiah et al. 2015). The magnitude and statistical significance of these effects vary systematically with event design and portfolio construction, with sharper reactions reported in studies using narrow event windows and explicit differentiation between carbon-intensive and low-carbon firms.

TABLE 3 | Results of the event studies on transition risk.

Study	Sample index (stock market index)	Sample period	Portfolio structure	Climate risk event	Stock market reaction	Green stocks outperform	Contextual variables
1. Alessi et al. (2023)	Several European stock exchanges	2006–2020	Climate risk exposure/environmental responsibility (NACE)	Supranational policy event; regulation; shift in public preferences	Negative	Not tested	Corporate environmental responsibility
2. Antoniuk and Leirvik (2021)	MSCI, S&P 500, Russell 2000, Russell 3000, FTSE	2009–2016	Industry affiliation	Supranational policy event; presidential election	Negative	Yes	Industry affiliation
3. Berkman et al. (2019)	Russell 3000	2015–2017	Climate risk exposure/environmental responsibility (CERES)	Supranational policy event; presidential election; regulation	Positive as reduced government commitment lowered expected regulatory costs for polluting firms	Not tested	Corporate environmental responsibility
4. Birindelli and Chiappini (2021)	Stoxx Europe 600	2013–2018	Industry affiliation; climate risk exposure/environmental responsibility (Refinitiv/LSEG)	Supranational policy event; regulation	Negative	Not tested	Industry affiliation; corporate environmental responsibility
5. Birindelli et al. (2023)	Stoxx Europe 600, NYSE, CSI300, NIFTY500	2021	Industry affiliation; regional regulatory stringency; climate risk exposure/environmental responsibility (Refinitiv/LSEG)	Supranational policy event; regulation	Negative	Not tested	Industry affiliation; corporate environmental responsibility; regional regulatory stringency
6. Borghesi et al. (2022)	Stoxx 100 All Europe	2019–2021	Climate risk exposure/environmental responsibility (Refinitiv/LSEG)	Supranational policy event	Positive as regulation signaled fiscal stimulus; green firms gain directly, brown firms via spillovers	Not tested	Corporate environmental responsibility
7. Chatjuthamard et al. (2024)	CRSP value-weighted index	2016	Climate risk exposure	Presidential election	Negative	Not tested	—

(Continues)

TABLE 3 | (Continued)

Study	Sample index (stock market index)	Sample period	Portfolio structure	Climate risk event	Stock market reaction	Green stocks outperform	Contextual variables
8. Chen et al. (2024)	Shanghai Stock Exchange	2008–2022	Industry affiliation	Supranational policy event; regulation	Negative	Yes	Industry affiliation
9. Cho et al. (2024)	Korean Stock Market	2015–2021	Undefined	Presidential election	Negative	Not tested	—
10. Diaz-Rainey et al. (2021)	S&P 500, S&P 400, S&P 600, S&P/ TSX Composite, Russell 3000, NYSE, AMEX, NASDAQ, TSX, NYSE/Area	2014–2018	Industry affiliation; location	Supranational policy event; regulation; presidential election	Negative	Not tested	Industry affiliation; location; investor type
11. Ge et al. (2024)	CSI 300 Index	2021	Industry affiliation; investor type	Supranational policy event	Negative	Not tested	Industry affiliation
12. Genovese (2021)	Global stock market index, NYSE, the Renewable Energy Industrial Index	2005–2010	Industry affiliation	Supranational policy event	Negative	Not tested	Industry affiliation
13. Han et al. (2019)	ASX 200 return as the proxy	2011	Industry affiliation	Regulation	Negative	Not tested	Industry affiliation
14. Harrison et al. (2024)	Stoxx Europe 600	2013–2021	Industry affiliation	Regulation	Negative	Not tested	Industry affiliation
15. Jiang and Luo (2018)	HS300 (correlated with other 9 foreign stock market indexes)	2009–2011	Industry affiliation	Supranational policy event	Positive as regulation was expected to be stricter	Not tested	Industry affiliation
16. Koch et al. (2016)	Intercontinental Exchange European Climate Exchange	2008–2014	Undefined	Regulation	Negative	Not tested	—
17. Kordsachia et al. (2023)	CRSP Index	2002–2019	Undefined	Shift in public preferences	Negative	Not tested	—
18. Kruse et al. (2024)	MSCI ACWI	2015	Climate risk exposure/ environmental responsibility (FTSE)	Supranational policy event	Positive (for green stocks)	Yes	Corporate environmental responsibility

(Continues)

TABLE 3 | (Continued)

Study	Sample index (stock market index)	Sample period	Portfolio structure	Climate risk event	Stock market reaction	Green stocks outperform	Contextual variables
19. Kumari et al. (2024)	S&P Global Oil Index (SPGOI)	2021	Industry affiliation; location	Supranational policy event	Mixed, negative except in resilient, developed markets	Not tested	Industry affiliation; location
20. Liu et al. (2023)	companies from A-share (excluding the ChiNext Board and the SME Board) in China	2021	Industry affiliation	Supranational policy event	Mixed, negative except firms with diverse suppliers or stable supplier ties (more resilient).	Not tested	Industry affiliation
21. Luo and Tang (2014)	Australian Securities Exchange top 200, New Zealand 50 market index, Tokyo market index, S&P500, FTSE100, Chinese A share market index	2011	Industry affiliation	Regulation; domestic policy event	Negative	Not tested	Industry affiliation
22. Mueller et al. (2023)	Stoxx Europe 600	2019	Climate risk exposure/ environmental responsibility (Refinitiv/LSEG)	Supranational policy event; regulation	Negative	Not tested	Corporate environmental responsibility
23. Mukanjari and Sterner (2023)	S&P 500, MSCI All Country World Index, Dow Jones US Coal, Stowe Global Coal, Dow Jones US Oil&Gas, World Solar Energy, Ardour Solar Energy, S&P Global Clean Energy	2015–2021	Industry affiliation	Supranational policy event; presidential election	Negative	Yes	Industry affiliation
24. Neszveda and Siket (2023)	Euro Stoxx 50	2010–2020	Climate risk exposure/ environmental responsibility (Refinitiv/LSEG)	Supranational policy event	Negative	Yes	Corporate environmental responsibility

(Continues)

TABLE 3 | (Continued)

Study	Sample index (stock market index)	Sample period	Portfolio structure	Climate risk event	Stock market reaction	Green stocks outperform	Contextual variables
25. Pandey et al. (2023)	S&P Global Clean Energy Index	2021	Index listing	Supranational policy event	Mixed; negative except for firms in strong-policy countries (high CCPI) or with solid ESG/size show less negative or mild positive reactions.	Yes	—
26. Pandey et al. (2024)	BIST 100	2020–2022	Undefined	Supranational policy event	Negative	Not tested	—
27. Pham et al. (2019)	DAX30	2013–2017	Industry affiliation	Supranational policy event	Negative	Not tested	—
28. Pham et al. (2020)	French stock price index	2003–2013	Industry affiliation	Supranational policy event; regulation	Negative	Not tested	Industry affiliation
29. Pham et al. (2023)	NASDAQ OMX Green Economy Index	2014–2022	Industry affiliation	Supranational policy event; regulation; presidential election	Positive (for green stocks)	Yes	Industry affiliation
30. Qian et al. (2020)	ASX All Ordinaries Index	2009–2014	Undefined	Domestic policy event; regulation	Negative	Not TESTED	—
31. Ramelli et al. (2021)	Stoxx Europe 600	2019	Industry affiliation	Shift in public preferences	Negative	Not tested	Industry affiliation
32. Ramiah et al. (2013)	ASX 200	2005–2011	Industry affiliation	Supranational policy event	Negative	Not tested	Industry affiliation
33. Ramiah et al. (2015)	S&P 500, 45 country (FTSE) indices and FTSE All-World index	1996–2011	Industry affiliation	Presidential election; regulation	Negative	Not tested	Industry affiliation
34. Ramiah et al. (2016)	London Stock Exchange	2003–2012	Industry affiliation	Supranational policy event	Positive if lax policies or demand effects created winners; polluters often unaffected because of cost pass-through	Not tested	Industry affiliation; corporate environmental responsibility

(Continues)

TABLE 3 | (Continued)

Study	Sample index (stock market index)	Sample period	Portfolio structure	Climate risk event	Stock market reaction	Green stocks outperform	Contextual variables
35. Schuster et al. (2023)	Stoxx Europe 600, S&P 500	2019–2022	Climate risk exposure/ environmental responsibility (Refinitiv/LSEG)	Shift in public preferences	Negative	Not tested	—

Note: This table presents information about the final sample ($n = 50$) of this systematic literature review across the following categories: study, sample index (stock market index), sample period, portfolio structure, climate risk event, stock market reaction, green stocks outperform, and contextual variables. The results are separated into three panels according to the climate risk type. The findings are presented in greater detail when studies distinguish stock market reactions based on specific portfolios, events, regions, or contextual factors. In the absence of such differentiation, the result is reported as a generalized overall finding.

This pattern may turn positive, however, when studies differentiate between green and brown firms. For example, Antoniuk and Leirvik (2021) document negative stock market reactions to salient transition risk information for most industries, with the exception of clean energy. Similarly, Chen et al. (2024) and Mukanjari and Sterner (2023) confirm that renewable energy firms receive positive stock price reactions while stocks in carbon-intensive industries experience negative reactions to regulatory and supranational policy events that revise expectations about future cash flows. This subset of the literature observes similar outperformance of green firms, typically in designs that explicitly contrast green and brown portfolios to isolate valuation effects, that is, Borghesi et al. (2022), Kruse et al. (2024), Neszveda and Siket (2023), Pandey et al. (2023), and Pham et al. (2023). Another stream of studies shows that the strength of these reactions depends on contextual factors, highlighting how variation in institutional setting and investor composition conditions valuation and salience mechanisms, such as industry (Pham et al. 2019), periods (Genovese 2021), regulatory events (Koch et al. 2016; Qian et al. 2020), board structures (Kumari et al. 2024), policy events (Pandey et al. 2024), investor type (Blanco et al. 2024; Ge et al. 2024), and regulatory stringency across jurisdictions (Birindelli et al. 2023). Ge et al. (2024) also note that retail investors are more prone to salience bias and short-term overreaction than institutional investors.

The few studies that document positive market reactions to transition risks are readily explained, as they typically identify such effects only for green firms whose long-term commitments were rewarded (Kruse et al. 2024; Pham et al. 2020), for cases in which investors anticipated fiscal support accompanying regulation (Borghesi et al. 2022; Tamechika and Okuda 2017), or for regulatory announcements that proved less stringent than expected (Berkman et al. 2019; Jiang and Luo 2018; Ramiah et al. 2016), thereby generating the inverse but economically consistent response.

A distinct evidence pool examines shifts in public preferences, focusing on Fridays for Future as a high-salience setting in which attention-driven pricing effects can be isolated (Alessi et al. 2023; Kordsachia et al. 2023; Ramelli et al. 2021; Schuster et al. 2023). While Alessi et al. (2023), Kordsachia et al. (2023), and Schuster et al. (2023) report an overall negative stock market response to climate activism, Ramelli et al. (2021) find that carbon-intensive firms in particular experienced negative market reactions to the first Global Climate Strike following heightened public and media attention. Despite the overall negative stock market reactions, Schuster et al. (2023) confirm that brown stocks underperformed relative to the market when salience increased through concentrated public attention. Overall, transition risk events generate more frequent and statistically significant abnormal returns because policy shocks create discrete valuation updates under efficient markets and simultaneously heighten salience through media attention and regulatory visibility. Heterogeneity in effect size and significance across transition risk studies primarily reflects differences in portfolio construction, regulatory context, and estimation choices, rather than inconsistent market responses to transition risks themselves.

TABLE 4 | Results of the event studies on physical risk.

Study	Sample index (stock market index)	Sample period	Portfolio structure	Climate risk event	Stock market reaction	Green stocks outperform	Contextual variables
36. Addoum et al. (2023)	AMEX, Nasdaq, NYSE	2018–2021	Industry affiliation	Extreme temperature	Insignificant	Not tested	Industry affiliation
37. Blanco et al. (2024)	CRSP value-weighted index	1980–2013	Investor type	Extreme weather events such as hurricanes and flooding	Negative	Not tested	Industry affiliation; location; investor type
38. Bourdeau-Brien and Kryzanowski (2017)	US-traded stocks from CSRP database	1990–2014	Location	storm; flooding; extreme temperature; winter weather; wildfire	Insignificant	Not tested	Location
39. Chen et al. (2023)	Shanghai A-Share Composite Index	2014–2021	Industry affiliation	Storm; flooding	Negative	Not tested	Industry affiliation
40. Lamb (1995)	CRSP Index	1992	Industry affiliation; location	Hurricane	Negative	Not tested	Industry affiliation; location
41. Lamb (1998)	CRSP Index	1989, 1992	Location	Hurricane	Negative	Not tested	—
42. Lanfear et al. (2019)	NYSE, NYSE MKT (formerly AMEX), NASDAQ	1990–2017	KPI	Hurricane	Negative	Not tested	—
43. Malik et al. (2020)	CRSP database, US firms	1960–2015	Industry affiliation; location	Extreme temperature; storm; flooding; wildfire	Negative	Not tested	Industry affiliation
44. Muller and Kräussl (2011)	S&P 500, US Fortune 500	2004	Undefined	Hurricane	Negative	Not tested	—
45. Robinson and Bangwayo-Skeete (2017)	Barbados (BSE), Bahamas (BISX), Eastern Caribbean (ECSE), Guyana (GASCI), Jamaica (JSE), and Trinidad and Tobago (TTSE) stock exchanges	2007–2008	Undefined	Hurricane	Negative	Not tested	—

(Continues)

TABLE 4 | (Continued)

Study	Sample index (stock market index)	Sample period	Portfolio structure	Climate risk event	Stock market reaction	Green stocks outperform	Contextual variables
46. Tamechika and Okuda (2017)	TOPIX	2009–2010	Undefined	Domestic policy event	Positive as regulation signaled fiscal stimulus; green firms gain directly, brown firms via spillovers	Not tested	—
47. Yamasaki (2015)	TOPIX	1979–2013	Industry affiliation	Typhoon	Positive as shareholders of insurance companies expect to receive higher premiums in the future	Not tested	Industry affiliation; location; investor type

Note: This table presents information about the final sample ($n = 50$) of this systematic literature review across the following categories: study, sample index (stock market index), sample period, portfolio structure, climate risk event, stock market reaction, green stocks outperform, and contextual variables. The results are separated into three panels according to the climate risk type. The findings are presented in greater detail when studies distinguish stock market reactions based on specific portfolios, events, regions, or contextual factors. In the absence of such differentiation, the result is reported as a generalized overall finding.

TABLE 5 | Results of the event studies on mixed climate risk.

Study	Sample index (stock market index)	Sample period	Portfolio structure	Climate risk event	Stock market reaction	Green stocks outperform	Contextual variables
48. Boungou and Urom (2023)	Stoxx Europe 600, DJ Banks Titans 30, Refinitiv bank price indexes for the G20 countries	2011–2019	Index listing	Climate news; multiple extreme weather events such as flooding and droughts; national and supranational policy events	Negative	Not tested	—
49. Griffin et al. (2015)	Datastream Energy Index	2009–2013	Industry affiliation	Climate news	Negative	Not tested	—
50. Teutrine et al. (2024)	Stoxx Europe 600	2018–2023	Climate risk exposure/environmental responsibility (Refinitiv/LSEG); industry affiliation	Climate news	Negative	Not tested	—

Note: This table presents information about the final sample ($n = 50$) of this systematic literature review across the following categories: study, sample index (stock market index), sample period, portfolio structure, climate risk event, stock market reaction, green stocks outperform, and contextual variables. The results are separated into three panels according to the climate risk type. The findings are presented in greater detail when studies distinguish stock market reactions based on specific portfolios, events, regions, or contextual factors. In the absence of such differentiation, the result is reported as a generalized overall finding.

4.2.2 | Physical Risks: Small and Unsystematic Penalties in the Capital Market

Stock market reactions to physical risk events are markedly weaker and more heterogeneous because most events convey limited new information beyond anticipated geographic exposure and rarely trigger revisions of expected cash flows or discount rates. The following studies should thus be interpreted through the lens of anticipation and exposure-based valuation, where differences in event design, industry focus, and location explain why many effects are insignificant or sector-specific. This comparatively thinner and more descriptive evidence base reflects the structure of the underlying literature. Physical risk studies predominantly operationalize exposure through geography and sector, which limits the scope for green–brown portfolio differentiation and poses methodological challenges for identifying valuation effects when risks are anticipated, diffuse, and weakly salient.

Addoum et al. (2023), Bourdeau-Brien and Kryzanowski (2017), and Robinson and Bangwayo-Skeete (2017) find primarily insignificant stock market reactions to extreme weather events such as storms, floods, and extreme temperatures for listed firms in the affected locations, consistent with muted stock price responses to anticipated risks. These insignificant results are closely tied to event-study design choices, as geographically predictable exposure and longer event windows limit revisions of expected cash flows and discount rates at the announcement date. Chen et al. (2023) find insignificant market reactions to storms and floods in the insurance and banking industries, but negative market reactions for security firms when events trigger localized valuation updates. Blanco et al. (2024) found that institutional investors tend to sell stocks of firms headquartered near areas affected by extreme weather events as new information raises short-term risk perceptions. Lamb (1995), Lanfear et al. (2019), and Muller and Kräussl (2011) further emphasize the negative impact of hurricanes on stock returns, reinforcing the notion that physical risk exposure is significantly influenced by geographical factors that condition investor anticipation. Malik et al. (2020) highlight different stock market reactions to meteorological disasters across various industries. Their findings indicate a negative reaction for local banks, whereas nonlocal ones experience positive reactions, reflecting heterogeneous valuation effects driven by exposure differences. Additionally, the construction, insurance, and healthcare industries demonstrate positive stock market reactions, reflecting varying sensitivities to such events depending on the sector's exposure and role in disaster recovery and mitigation that temporarily alters expected cash flows. Yamasaki (2015) is the only study that finds positive stock returns after natural disasters. For Japanese insurance firms, typhoons increased demand for insurance services, which lifted their stock prices in the short term through upward revisions of expected cash flows. However, longer-lasting events imposed financial costs, so the overall effect of typhoons was negative once valuation revisions incorporated anticipated losses. Heterogeneity in physical risk findings thus arises from differences in event persistence, sectoral exposure, and the degree to which risks are anticipated, rather than from fundamentally different pricing logics.

4.2.3 | Mixed Risks: Seeing Climate Events and Policy Interact

Mixed risk studies combine physical shocks with transition-related expectations, activating both valuation updates and attention-driven mechanisms, which lead to less uniform stock market responses. The evidence summarized below should be read as conditional repricing in which heterogeneity reflects whether physical events primarily revise cash-flow expectations directly or operate indirectly by accelerating anticipated regulatory responses.

Boungou and Urom (2023) examine the banking industry and show that transition risk events (national and supranational policy events) lead to positive stock price reactions, and physical risk events (climate news) to negative ones as investors revise valuations in response to risk-specific information. Variation across mixed risk studies largely reflects identification challenges, as physical shocks and policy expectations overlap in time, making valuation revisions sensitive to sectoral exposure and the timing of information release. This finding may be limited to the banking industry, because Griffin et al. (2015) and Teutrine et al. (2024) find that climate news can trigger negative market reactions for both transition and physical risk events when heightened salience dominates valuation effects. Teutrine et al. (2024) observe a tendency toward negative stock market reactions across all levels of corporate emissions responsibility but find positive reactions at the industry level for alternative energy firms consistent with heterogeneous revisions of expected cash flows across sectors. Heterogeneity in mixed risk evidence reflects whether physical shocks primarily trigger sector-specific cash-flow revisions or operate indirectly by accelerating expectations about regulatory and policy responses.

4.2.4 | Green vs. Brown Stocks: Why Transition Risk Studies Are More Often Significant

Transition risk studies often report significant results, whereas physical risk studies more frequently yield insignificant effects. Transition risks generate stronger market responses because clear and date-specific policy announcements convey new information that triggers valuation revisions, whereas chronic physical risks diffuse across time and space and limit surprise. Another pattern for the significant results of transition studies is that they typically differentiate between green and brown stocks, which sharpens the detection of market responses, whereas physical risk studies in our sample never make this distinction. This pattern indicates that statistical significance in climate risk event studies is not inherent to risk type but emerges from portfolio design choices that align valuation exposure with the information content of the event. The analysis highlights the tendency for increasing transition risks leading to the underperformance of brown stocks (firms operating in carbon-intensive industries and those with low environmental responsibility) and the outperformance of green stocks (firms operating in renewable energy and those with high environmental responsibility). This pattern reflects revisions of expected cash flows and discount rates that penalize carbon exposure and reward environmental responsibility. These findings align with the theoretical foundation (Figure 6). The majority of the reviewed studies differentiate portfolios according to industries (Antoniuk and Leirvik 2021; Birindelli and Chiappini 2021; Birindelli et al. 2023; Chatjuthamard et al. 2024; Chen et al. 2024; Diaz-Rainey et al. 2021; Diaz-Rainey et al. 2023; Ge et al. 2024; Genovese 2021; Han et al. 2019; Harrison et al. 2024; Jiang and Luo 2018; Kumari et al. 2024; Liu et al. 2023; Luo and Tang 2014; Mukanjari and Sterner 2023; Pham et al. 2019; Pham et al. 2020; Pham et al. 2023; Ramelli et al. 2021; Ramiah et al. 2013; Ramiah et al. 2016; Ramiah et al. 2015), followed by corporate environmental responsibility (Alessi et al. 2023; Berkman et al. 2019; Birindelli and Chiappini 2021; Birindelli et al. 2023; Borghesi et al. 2022; Kruse et al. 2024; Mueller et al. 2023; Neszveda and Siket 2023; Schuster et al. 2023).

In contrast, studies on physical risks commonly do not differentiate between portfolios based on green or brown stocks, resulting in generally insignificant or negative stock market effects because anticipated exposure limits valuation updates. The lack of portfolio differentiation in physical risk studies may stem from the assumption that physical risk exposure does not depend on firms' environmental performance, but rather on their geographical and sectoral vulnerabilities that shape investor expectations ex ante and reduce the scope for repricing at the event date. Policies related to climate change create concrete and measurable disadvantages for carbon-intensive firms, while physical risks are more diffuse and location-specific. However, because prominent physical risks also increase transition risks (Figure 6), heterogeneity in observed stock market reactions can arise when portfolio differentiation by carbon exposure (green vs. brown) conditions valuation responses even to physical shocks. Overall, green–brown portfolio differentiation sharpens stock market reactions because carbon exposure directly conditions expected cash-flow penalties under valuation logic and intensifies investor attention under salience when climate risks become focal.

4.2.5 | Just a Game of Methods? The Lack of Theory in Event Studies on Climate Risk

As outlined by our framework, these patterns show that climate risk pricing strengthens when valuation relevance and investor attention align, and weakens when risks diffuse across time, space, or expectations. Forty-eight of the 50 studies showed statistically significant stock market reactions to climate risk events, confirming that the impact of these risks on stock returns aligns with the theory-guided organizing framework. Figure 6 applies the framework introduced in Figure 1 to the 50 examined studies.

We find that merely 13 of the 50 reviewed studies explicitly rely on theoretical foundations of either market efficiency or cognitive biases. Notably, only two studies explain their results based on behavioral finance theory and salience bias, as presented in Option A of Figure 6 (Ge et al. 2024; Ramiah et al. 2013). Figure 6 illustrates that five studies find that the combined influence of media and public attention can cause overreactions in

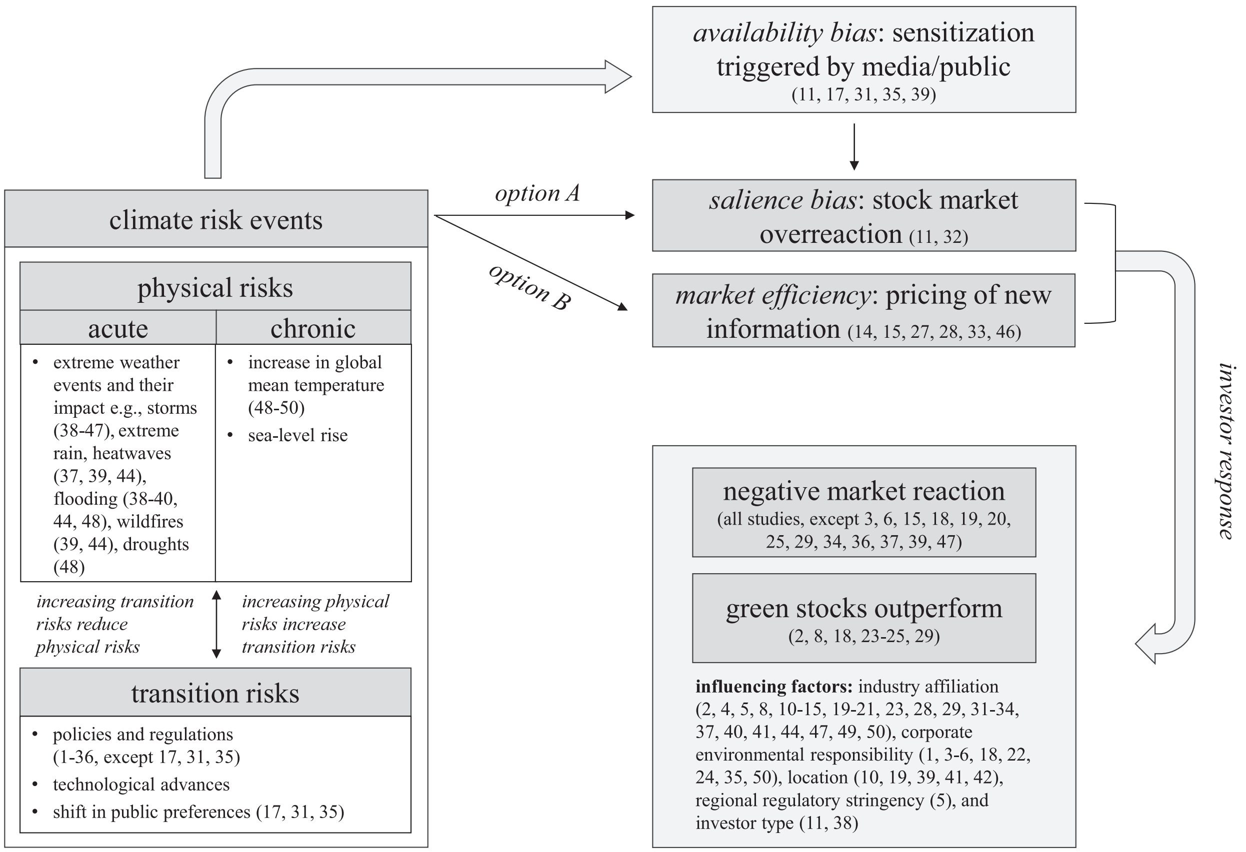

FIGURE 6 | Mapping of studies within the theoretical framework. This figure maps the studies listed in Tables 3–5 (with their respective numbers in brackets) onto the theoretical framework, showing their placement within the categories of climate risks and investor response.

the stock market (Bourdeau-Brien and Kryzanowski 2017; Ge et al. 2024; Kordsachia et al. 2023; Ramelli et al. 2021; Schuster et al. 2023). Interestingly, all studies investigating shifts in public preferences related to the Fridays for Future movement incorporate the relevance of public attention (Kordsachia et al. 2023; Ramelli et al. 2021; Schuster et al. 2023). Finally, six studies explain stock market reactions using the efficient market hypothesis (Harrison et al. 2024; Jiang and Luo 2018; Pham et al. 2019; Pham et al. 2020; Ramiah et al. 2015; Robinson and Bangwayo-Skeete 2017), indicating that new information triggers investor responses (Fama 1991), as presented in Option B of the theoretical framework (Figure 6). Across risk types, the literature prices climate events most clearly when valuation relevance and investor attention coincide, and least clearly when risks remain diffuse, anticipated, or weakly salient.

5 | Discussion

5.1 | Synthesis

This systematic literature review aims to answer the research question: *How do investors react to climate-related events, categorized into physical and transition risks?* Across this sample, event-study designs vary systematically along several dimensions that shape the magnitude, timing, and statistical significance of reported abnormal returns. Studies differ in event window length, estimation models (market vs. multifactor models), and the level of analysis (portfolio-based vs. firm-level designs), while only a minority complement standard event-study tests with cross-sectional analyses of abnormal returns. These design choices matter because climate risks differ in their information content, anticipation, and salience, implying that heterogeneity in reported results partly reflects methodological variation rather than contradictory market responses. Across the reviewed evidence, analytical depth differs systematically between transition and physical risk studies, reflecting differences in data availability and event identifiability rather than selective emphasis by our review. Transition risk studies more often employ portfolio-based and event-specific designs, whereas physical risk studies are constrained by geographically defined exposure, anticipation effects, and limited scope for portfolio differentiation.

The empirical regularities synthesized in this review are therefore most robust in market-based financial systems with strong regulatory enforcement, high disclosure standards, and active investor attention to climate-related information. While the underlying mechanisms are conceptually general, the strength and visibility of stock market reactions are likely to vary across institutional contexts with different regulatory regimes and capital market structures. The synthesis below therefore interprets empirical findings through both the nature of the underlying climate risk and the event-study designs used to capture investor reactions.

5.1.1 | Propositions on Physical Risk Events

Physical climate risk events reduce firm value because increased uncertainty raises discount rates and weakens expected cash flow. From a theoretical perspective, both valuation models and behavioral finance predict negative investor responses to physical climate risk events. In asset pricing, higher risk raises discount rates and lowers firm value (Wahlen et al. 2022). Extreme weather such as floods, storms, or heatwaves increases uncertainty about future cash flows, so negative stock price reactions are consistent with market efficiency. Behavioral finance attributes these reactions to salience and availability bias. Salience bias makes investors overweight vivid disasters, and availability bias reinforces this by making recent events loom large in memory (Bordalo et al. 2012; Davidai and Gilovich 2016; Tversky and Kahneman 1992). Both mechanisms exert downward pressure on stock prices through discount rate adjustments. For chronic physical risk in particular, anticipation and gradual exposure lead investors to incorporate risk continuously into discount rates, which limits sharp reactions to single events (Krueger et al. 2020).

The empirical evidence mirrors these theoretical predictions. Across 15 studies, most report negative—or insignificant (Addoum et al. 2023; Bourdeau-Brien and Kryzanowski 2017)—market reactions. Event studies rarely detect new information sufficient to trigger strong valuation revisions. No study finds positive stock market effects from firms benefiting directly from disasters. The only exception is Yamasaki et al. (2024), who report short-term gains for Japanese insurance firms after typhoons, explained by higher expected premium income. This sector-specific response reflects investor anticipation of temporary cash-flow increases rather than a repricing of physical risk: Physical risk events are either priced in with muted responses or penalized with negative returns. For chronic physical risk in particular, the evidence remains largely inconclusive, as studies struggle to detect significant market responses to slow-moving hazards within the short windows of event study designs (Addoum et al. 2023).

Proposition 1a. *Physical climate risk events lead to negative stock market reactions when investors perceive these events as more severe than anticipated.*

Proposition 1b. *Physical climate risk events lead to muted stock market reactions when investors perceive these events as severe as anticipated.*

Proposition 1c. *Chronic physical risks lead to inconsistent (muted) stock market reactions when their diffuse and long-term nature makes them methodologically less amenable to detection in short-term event studies.*

5.1.2 | Propositions on Transition Risk Events

Transition risk events penalize carbon-intensive firms because regulation raises their cost of capital and reduces expected cash flows. From a theoretical perspective on firms and industries, transition risk events penalize firms with higher carbon intensity because regulation increases their cost of capital and reduces expected cash flows (Bolton and Kacperczyk 2021; Pástor et al. 2021). In equilibrium, investors anticipate regulatory exposure and reallocate capital toward firms with lower transition risk, consistent with rational pricing of systematic risk and socio-emotional preferences for sustainability (Pástor et al. 2021). Green industries and firms with strong environmental responsibility therefore function as hedges against transition risk through lower expected regulatory penalties.

Our analysis of empirical evidence strongly supports these theoretical arguments. On the industry level, numerous studies show that transition risk events trigger outperformance of green sectors and underperformance of carbon-intensive sectors (Antoniuk and Leirvik 2021; Chen et al. 2024; Mukanjari and Sterner 2023). Likewise, studies using firm-level environmental scores confirm that firms with superior responsibility experience smaller penalties—and in some cases even positive abnormal returns when transition risks intensify (Borghesi et al. 2022; Kruse et al. 2024; Neszveda and Siket 2023).

Proposition 2a. *Green industry affiliation serves as a hedge against transition risk events.*

Proposition 2b. *A firm's superior individual environmental responsibility serves as a hedge against transition risk events.*

Regulation and public attention reshape investor expectations by increasing the salience and valuation relevance of climate risks. From a theoretical perspective on external stakeholders, policymakers raise expected costs for carbon-intensive activities through regulatory measures such as carbon taxes, emission standards, or disclosure requirements, thereby creating incentives for capital to flow toward greener firms. This aligns with asset pricing logic, where higher expected regulatory costs for brown firms reduce their valuations (Wahlen et al. 2022). Public attention—especially in the form of intense media coverage—amplifies these effects by elevating climate risk salience in investment decisions (Bordalo et al. 2012; Tversky and Kahneman 1992).

Our analysis of empirical evidence finds clear support for both channels. Multiple studies show that transition risks tied to regulatory or policy actions lead to negative stock market reactions for carbon-intensive firms and positive reactions for green firms (Antoniuk and Leirvik 2021; Chen et al. 2024; Mukanjari and Sterner 2023). Likewise, studies on public attention demonstrate that stock market reactions are stronger when climate events attract significant media coverage (Ge et al. 2024; Huynh and Xia 2023; Schuster et al. 2023). Importantly, extant evidence indicates that *it is not climate activists themselves* who move markets, but the public attention they generate. For example, the Fridays for Future movement only triggered stock market reactions when protests were highly visible and widely reported in the media (Ramelli et al. 2021; Schuster et al. 2023). Therefore, empirical evidence only supports that investors react to the salience of climate concerns, but not to the original actions of activists. This underscores that regulation and public attention function as the two external drivers that reallocate capital from brown to green firms.

Proposition 3a. *Policymakers prompt investors to reallocate capital from brown to green firms.*

Proposition 3b. *Public attention prompts investors to reallocate capital from brown to green firms.*

5.1.3 | Propositions on Paradigm-Driven Interpretations of Investor Reactions

The interpretation of climate risk event studies depends on the theoretical paradigm that structures investor behavior. Based on the theoretical foundation presented in this review, it is not possible to conclusively determine whether investors react rationally or overreact to climate risk events because empirical findings reflect paradigm-specific assumptions. Studies relying on the efficient market hypothesis assume rational behavior and report heterogeneous results (e.g., Birindelli and Chiappini 2021; Kordsachia et al. 2023). In contrast, studies employing behavioral finance theory assume biased behavior and consistently find negative stock market reactions which they interpret as overreaction driven by salience and attention (Ge et al. 2024; Ramiah et al. 2013). Most studies leave their underlying behavioral assumptions implicit. Paradigm choice therefore conditions what constitutes evidence and how stock market reactions are interpreted. Comparisons across studies require attention to framing differences rather than direct aggregation of reported effect. This deserves its own propositions:

Proposition 4a. *Researchers who rely on the efficient market hypothesis tend to explain stock market reactions to climate risk events as differentiated responses to new information.*

Proposition 4b. *Researchers who adopt a behavioral finance perspective tend to explain stock market reactions to climate risk events as overreactions driven by salience and availability biases.*

Overall, this review highlights that evidence across subtypes of climate risk remains uneven with notable gaps on chronic physical and technological risks, as well as risk interactions (mixed risks). However, when clustering results into transition and physical risks, a consistent pattern emerges: Climate risk events generally trigger negative stock market reactions, underscoring the financial relevance of global warming. Heterogeneous findings across studies reflect differences in theoretical framing rather than contradictory evidence. This review therefore does not adjudicate between efficient market and behavioral finance explanations but uses both paradigms to discipline the interpretation of event study results. Apparent inconsistencies in reported effects often arise because identical events are interpreted through different, frequently implicit, assumptions about investor behavior.

5.2 | Research Gaps and Future Research Agenda

The following research gaps are derived directly from systematic patterns and omissions identified in the reviewed event studies.

5.2.1 | Technological Innovations

The reviewed event studies summarized in Tables 3–5 show that research on transition risks predominantly focuses on policy and regulatory events, while technological change appears only indirectly through portfolio composition. However, technological advancements are largely overlooked as potential drivers of stock market reactions. From a valuation perspective, innovations in renewable energy, storage, or carbon capture can fundamentally alter firms' expected cash flows and competitive positions, thereby creating both risks for carbon-intensive firms and opportunities for green firms. Our review shows that some studies implicitly capture such dynamics by focusing on renewable energy indices or alternative energy portfolios, which often react positively to climate-related events (e.g., Chen et al. 2024; Kruse et al. 2024; Mukanjari and Sterner 2023; Teutrine et al. 2024). However, none of the studies in our final sample explicitly operationalize technological breakthroughs as the event under investigation—such as strategically relevant patent announcements, or disruptive cost reductions in operations. Future research should therefore identify and isolate whether technological innovations generate patterns of stock market reactions that are distinct from physical or policy-driven transition risks. Such research could also examine whether innovations create more heterogeneous market responses, given that technology adoption diffuses gradually and interacts with industry structures and firm-specific capabilities (Rogers 1983).

5.2.2 | Chronic Physical Risks

The reviewed event studies summarized in Table 4 show that research on physical risks predominantly examines acute events such as hurricanes, heatwaves, and floods, which are salient, datable, and highly visible in media coverage, making them more likely to trigger immediate stock market responses. However, the acute physical risk studies in the final sample do not address extreme rainfall (Figure 6), leaving this area open for future research. In contrast, chronic physical risks, such as gradual sea-level rise, biodiversity loss, permafrost melt, or desertification, unfold over long horizons. From a valuation perspective, such risks should still increase discount rates and reduce firm values, yet their gradual nature makes them less likely to be incorporated into market pricing. From a behavioral perspective, salience bias (Bordalo et al. 2012; Ge et al. 2024) and availability bias (Davidai and Gilovich 2016; Tversky and Kahneman 1992) suggest that investors are prone to underreaction when risks are distant, abstract, or less vivid. This logic aligns with our Proposition 1c, which highlights muted market responses to chronic physical risks compared to acute ones. However, the existing literature provides almost no direct evidence on chronic physical risks. Future research could operationalize chronic physical risks indirectly through events that raise their salience, such as IPCC report releases (Teutrine et al. 2024), long-term insurance premium adjustments (Jarzabkowski et al. 2015), or disruptive policy announcements such as the *European Green Deal*. Because Stroebel and Wurgler (2021) predict that the effect of physical risks will dominate in the long run, future studies could assess whether persistent underreaction to chronic risks accumulates into systematic mispricing with implications for financial stability.

5.2.3 | Green Stocks Under Physical Risks

The reviewed event studies summarized in Table 4 show that portfolio differentiation between green and brown stocks is not applied in the context of physical risk events, despite being central to the analysis of transition risks. While reducing greenhouse gas emissions is crucial for shielding business models from mounting carbon policies and shifts in public preferences, the current literature suggests that exposure to physical risks is predominantly dependent on location (Bourdeau-Brien and Kryzanowski 2017). However, the findings of Huynh and Xia (2023) suggest that outperformance of green stocks can also occur in the context of physical risk events, highlighting the role of public attention, investor perceptions, and salience bias, as depicted in the framework (Figure 6). This stock market reaction may arise because transition and physical risks are interconnected, as also suggested in the framework (Figure 6). As physical risks intensify, they raise the salience of global warming and thereby increase the relevance of emissions-related firm characteristics. The salience of global warming and its physical impacts heightens the importance of reducing greenhouse gas emissions. Accordingly, we recommend that future research extend portfolio differentiation to physical risk event studies and distinguish green and brown stocks based on industry affiliation or firm-level environmental performance (Teutrine et al. 2024). Such designs would allow researchers to identify whether physical risks trigger heterogeneous stock market responses once transition-related firm characteristics become salient.

5.2.4 | ESG Data Source Bias

The content analysis summarized in Tables 3–5 shows that, while most studies classify climate risk portfolios based on industry affiliation, a smaller subset differentiates firms by individual environmental performance, relying predominantly on ESG ratings from a single provider. Specifically, seven of the 10 studies that differentiate the effects of transition risk events according to firms' environmental responsibility use the emissions score (Birindelli and Chiappini 2021; Birindelli et al. 2023; Mueller et al. 2023; Neszveda and Siket 2023; Teutrine et al. 2024) or the environmental pillar score (Borghesi et al. 2022; Schuster et al. 2023) provided by the London Stock Exchange Group (LSEG; formerly Refinitiv) as proxies (Tables 3–5). This concentration regarding LSEG ratings may bias the results, as Berg et al. (2022) have shown that different ESG rating providers can produce varying scores for the same firms. To enhance the robustness of the finding that green stocks outperform during transition risk events, it is crucial to assess a broad and nuanced understanding that firm managers and investors can rely on. It would be valuable to identify which ESG metrics are the most reliable and, thus, provide the most effective hedging against climate risks.

5.2.5 | Global South and Regulation

The reviewed studies summarized in Tables 3–5 rely primarily on European and US data, leaving large regions such as Southeast Asia, Africa, and Latin America underrepresented. This gap is significant because regional contexts determine both the salience of physical risks and the severity of transition risks. Regulatory frameworks differ widely: Highly regulated markets, such as Europe, impose clear penalties on carbon-intensive industries, while less stringent regimes in the US, China, or India can even reward such firms (Birindelli et al. 2023). These findings suggest that the same transition event may trigger *opposite* stock market reactions depending on jurisdiction. Beyond regulation, vulnerability to climate hazards also varies, with the Global South facing greater exposure to physical risks (Bohle et al. 1994) but remaining almost absent from the sample. This absence is problematic because financial markets in emerging economies may react differently to climate shocks, not only due to higher exposure but also due to lower capital market orientation and weaker disclosure infrastructures (Abaidoo and Agyapong 2022). Future research should therefore pursue two directions: comparative studies of industrialized and emerging countries to assess how regulatory stringency shapes transition risk reactions (e.g., Kunkel et al. 2025), and analyses of underrepresented regions to capture how vulnerability to physical risks interacts with less developed financial systems. Together, such research would offer a more global understanding of how climate risks affect capital markets.

5.2.6 | Investor Heterogeneity and Their Logics

The reviewed event studies summarized in Tables 3–5 rarely distinguish investor reactions by type, despite the theoretical framework suggesting that the degree and direction of stock market responses to climate risk events may vary across investors. The framework suggests that the degree and direction of stock market reactions to climate risk events may vary according to the type of investor. Institutional and retail investors differ in their time horizons, sophistication, and susceptibility to cognitive biases. For instance, salience bias is more likely to drive short-term overreactions among retail investors, whereas institutional investors are expected to respond in a more systematic and rational manner. However, only two studies distinguish between investor reactions by type (Blanco et al. 2024; Ge et al. 2024), leaving a major gap in understanding whether observed stock market responses reflect differences in investor composition rather than uniform market behavior. Beyond investors, firms are also subject to implicit and explicit claims from a wider set of stakeholders (Cornell and Shapiro 1987). These stakeholder claims can alter risk perceptions and capital market reactions, yet the event study literature has so far neglected their role. Future research should therefore examine whether heterogeneous investor groups and broader stakeholder pressures jointly shape market responses to climate risks.

Beyond investor heterogeneity, our review shows that findings often mirror the theoretical paradigm adopted: Efficient market studies frame results as rational adjustments, while behavioral finance studies emphasize overreactions. This *paradigm imprint* limits comparability across studies unless theoretical assumptions are made explicit. However, most studies focus narrowly on methods and neglect theory. Future research should therefore clarify why they assume the logics of investors' efficient or bias-prone (see Proposition 4).

5.2.7 | Methodological Shortcomings

The reviewed event studies summarized in Tables 3–5 reveal several recurring methodological limitations across the sample of 50 studies. The research field represented by the examined sample of 50 studies exhibits methodological shortcomings. According to Bouzzine (2021), event studies should include nonparametric as well as parametric test statistics and ideally use the three-factor model as the estimation model. However, most studies in the review only include parametric test statistics and rely on the market model for stock return estimation. Accordingly, future studies should also implement the listed methodological event study recommendations in this specific research field. Additionally, the final sample includes studies with quite long event windows. To align with the theorized market efficiency (Fama 1991), event studies should only use a short period for two reasons. First, the efficient market hypothesis suggests that market participants react immediately to new information (MacKinlay, 1997). Thus, a long period would dilute the results of the stock market effects. Second, long periods also increase the risk of encountering confounding events (McWilliams and Siegel 1997). Another methodological limitation is that many of the reviewed event studies do not include cross-sectional analyses of (cumulative) abnormal returns. While such analyses are not part of conventional event study methodology, they provide a valuable extension (Bouzzine, 2021). Cross-sectional analyses could enable future research to uncover more nuanced relationships between climate risk drivers and stock market reactions, as well as to establish causality. Moreover, this approach can help identify which factors listed in the framework are most relevant in driving stock market reactions and assess their impact. Based on the reviewed studies, we suggest focusing particularly on variables such as media coverage (Ge et al. 2024) (an external factor) and climate performance measures (firm-specific factors), such as emission reduction responsibility (Birindelli et al. 2023) or carbon intensity (Ramelli et al. 2021), to analyze variations in (cumulative) abnormal returns across stocks. Additionally, it would be interesting to examine whether these variables function as moderating or mediating factors in the effect of climate risk events on stock prices.

5.2.8 | Interdisciplinary Approaches (Horizontal and Vertical)

Our review summarized in Tables 3–5 shows that the literature on climate risk event studies is heavily concentrated in Finance, Economics, and Accounting, reflecting the origins of the event study methodology (MacKinlay, 1997). While this narrow disciplinary focus has produced valuable insights, it also constrains the range of questions asked and the interpretations offered. A *horizontal* expansion toward sustainability science and meteorology could deepen the understanding of how specific climate hazards translate into financial shocks (Schuster et al. 2025). Future research should also investigate contagion and spillover effects in capital markets from affected firms and industries to unaffected ones (Bouzzine and Lueg 2020).

Also, our analysis highlights the need for vertical interdisciplinarity: Very few studies consider how physical shocks can accelerate regulatory responses and thus trigger transition risks. In our sample, only three mixed risk studies attempt to capture such dynamics (Boungou and Urom 2023; Griffin et al. 2015; Teutrine et al. 2024). Future studies should establish more robust patterns of physical and transition risk interactions.

Overall, these eight gaps do not reflect broad calls for future research but design-specific limitations repeatedly observed in the existing event-study literature on climate risks.

5.3 | Contributions to Research

Previous research has predominantly focused on climate risks in the context of long-term asset pricing models. Our contribution to the field involves conducting a systematic literature review that specifically examines short-term stock market reactions to climate risks. Venturini (2022) has already structured the field in terms of physical and transition risks related to the stock market. However, we further contribute to the research field by conducting the first systematic database search of the literature and by offering a comprehensive analysis of existing research with a specific focus on event studies.

Additionally, this review conceptualizes a theory-guided organizing framework to explain investor reactions, integrating perspectives from behavioral finance theory, the influence of media and public attention, and the rational incorporation of information. This approach contributes to the debate on whether investor responses are driven by new information, in line with the efficient market hypothesis, or by behavioral overreactions influenced by salience bias. Studies such as Ge et al. (2024) and Schuster et al. (2023) highlight that salience bias and public attention related to transition risks drive stock market reactions, emphasizing the role of psychological patterns in investor behavior. In contrast, Blanco et al. (2024) conclude that investors rationally reassess the impact of physical risks during climate shocks. Given the lack of theoretical foundations in the reviewed literature, the proposed framework could serve as a valuable basis for future research to interpret and discuss event study findings in the context of climate risks. Additionally, the framework differentiates between climate risk types and incorporates various factors influencing investor reactions, which helps distinguish results and provide explanations. We synthesized the reviewed studies according to different categories and framework components, highlighting areas of focus in the research field (Figure 6). We further contribute to research by deriving four propositions from the findings, identifying eight major research gaps, and offering corresponding suggestions for future studies.

5.4 | Implications for Practice

Our research carries contributions for firms, investors, and policy makers.

For *firms*, our systematic literature review suggests several strategies to mitigate exposure to climate risks. Firms operating in brown industries, in particular, should aim to become sector leaders in environmental performance, as studies consistently show that companies with stronger ESG responsibility are less penalized and sometimes even rewarded during policy-driven transition events (Antoniuk and Leirvik 2021; Kruse et al. 2024). To strengthen resilience, firms can reduce exposure to carbon policies by improving emissions efficiency, enhancing ESG scores, and pursuing transparent disclosure practices. At the same time, location determines vulnerability to physical risks, implying that geographic diversification can lower exposure to localized shocks (Bourdeau-Brien and Kryzanowski 2017). Supply-chain resilience also matters, as firms with more diversified or stable supplier bases show more muted reactions to transition risk events (Liu et al. 2023). Finally, internal capabilities should be strengthened: Managers can implement employee training programs (Kunkel et al. 2025; Sult et al. 2024).

For *long-term investors*, this review highlights which firm characteristics are particularly vulnerable to specific types of climate risks. It finds that both physical and transition risks can lead to significant losses in firm value. While a firm's location may indicate its exposure to physical risks, the degree of alignment with the Paris Agreement in its strategy may reflect its exposure to transition risks. As part of their hedging strategies against climate risks, investors should consider corporate environmental responsibility and green industry affiliation, as our review shows these to be consistent determinants of outperformance. We acknowledge that financial instruments such as green bonds (Flammer 2021), carbon futures (Demiralay et al. 2022), or catastrophe-linked securities such as cat bonds (Polacek 2018) provide additional, concrete avenues for hedging climate risk exposure. While our systematic review does not analyze these instruments directly, they represent important complements to the portfolio-based strategies we identify. Future event study research could usefully control for their effectiveness in absorbing climate risks.

For *investors with a short-term investment horizon and intraday traders*, the findings of this systematic literature review hold greater significance than those derived from studies examining long-term asset pricing models due to the short-term focus of the reviewed event studies. Notably, existing research on asset pricing models suggests that green stocks tend to underperform over the long term (Ilhan et al. 2021; Pástor et al. 2021). However, our review supports Pástor et al. (2021) findings that green stocks tend to outperform when climate risks are salient, especially in the context of transition risks. The findings apply to green industries as well as firms with strong individual environmental performance, indicating that responsible sector leaders may mitigate the effects of industry affiliation. This is crucial knowledge for assembling a balanced portfolio that encompasses a broad spectrum of stocks from various industries. This review supports financial modeling by identifying the sources that lead to climate shocks in the market through the analysis and synthesis of all relevant event studies that have investigated the variety of climate risk events to date. Moreover, as climate risks tend to be underestimated (Stroebel and Wurgler 2021), the analyzed short-term investors' responses to salient climate risk events may represent overreactions as a compensatory effect. This highlights the need for better integration of climate risk exposures in financial modeling. Overall, investors should be aware of the potential for long-term underperformance of green stocks while also acknowledging their short-term hedging advantages, which should be integrated and differentiated in the strategies of both short-term and long-term investors.

Policymakers may conclude that investors are increasingly sensitized to climate risks, as 96% of the reviewed studies identify statistically significant stock market reactions to such events. On the one hand, the findings indicate that physical risks tend to trigger negative stock market reactions, highlighting the importance of policies and regulations aimed at mitigating these risks, as reflected by the theory-guided organizing framework (Figure 6). On the other hand, the analysis of transition risks, particularly those associated with policy and regulatory events, suggests that political pressure from governments is effective, as green portfolios often outperform while brown stocks underperform the market, both at the industry level and in terms of firms' individual environmental performance. This suggests that markets not only penalize brown industries but also reward green leaders within traditionally carbon-intensive industries, which is crucial for facilitating an economy-wide transition. These findings highlight the potential for policymakers to drive the transition to a decarbonized economy by using targeted policies and regulations to steer capital flows effectively. However, a significant barrier remains in the inconsistent implementation of climate policies at national levels, as the mismatches between international targets and national regulations create uncertainty for firms and investors. Consequently, supranational policy events trigger heterogeneous stock market reactions across countries with varying levels of regulatory stringency, as reported by Birindelli et al. (2023). To overcome these challenges, binding supranational environmental regulations could harmonize responses, reduce uncertainty, and facilitate a global green transformation of financial markets.

5.5 | Limitations

This systematic literature review has four major limitations. First, even systematic literature search approaches following the PRISMA framework are prone to bias in sample selection, particularly during article screening, despite our efforts to document decisions with justifications. Second, the selection process exclusively includes event studies published in journals listed in the AJG 2021, as these journals meet established quality criteria. Books, book chapters, and working papers are excluded since their quality cannot be reliably ensured or compared, given that they are not part of the AJG. Third, the empirical evidence synthesized in this review is geographically concentrated in Europe and the United States, which may limit the generalizability of the findings to institutional contexts with weaker regulatory enforcement, lower disclosure standards, or less developed capital markets. Fourth, event-study research with insignificant or weak effects may be subject to publication bias. On the same note, the reviewed sample includes numerous studies reporting muted or statistically insignificant stock market reactions—especially for physical risk events—indicating that nonfindings are routinely discussed in this literature. Nevertheless, this systematic review ensures comprehensive coverage of core literature and facilitates the comparison of high-quality research.

6 | Conclusions

The political pressure from the Paris Agreement, combined with increased public and media awareness of climate catastrophes, amplifies the threats to stock values posed by both transition and physical risks. This systematic literature review explores these threats to the stock market through theoretical lenses and analyzes empirical findings on the effects of various climate risk drivers on stock values, considering a range of influencing factors. When climate risks become salient to investors, stock values are likely to diminish. Therefore, investors should recognize the importance of hedging in this context. The reviewed literature suggests that green portfolios offer comparatively better protection.

Endnotes

[1] These events tend to be sensitization-triggered by the media/public (top right of Figure 1). Thereby, the salience bias is often complemented or preceded by the *availability bias* (Tversky and Kahneman 1992). Availability bias makes investors think an event is more likely just because it is easier to remember. What investors recall depends on what they see around them, and what they can easily remember from past experience (Dube-Rioux and Russo 2006). As a result, climate risk events that receive strong media attention become more available, which leads investors to overweight them in their decisions (Davidai and Gilovich 2016; Huynh and Xia 2023; Salman et al. 2021).

[2] For the search string, we relied on the following search terms being part of studies' title, abstract, or keywords: "event study" OR "market reaction*" OR "stock price reaction*" OR "stock price effect*" OR "stock market effect*" OR "investor reaction*" OR "market response" OR "investor response" OR "stock return*" OR "abnormal return*" AND "global warming" OR "climate risk*" OR "climate change" OR "climate transition" OR "transition risk*" OR "transitional risk*" OR "energy transition" OR "technolog* shift" OR "technolog* change" OR "technolog* risk*" OR "technolog* transition" OR "climate polic*" OR "climate regulation*" OR "preference change*" OR "preference shift" OR "green consumer*" OR "green investor*" OR "physical risk*" OR "extreme weather" OR "extreme event*" OR "natural disaster*" OR "flood*" OR "cyclone*" OR "bushfire*" OR "wildfire*" OR "heat" OR "heat wave*" OR "heatwave*" OR "hurricane*" OR "storm*" OR "rain" OR "drought*" OR "sea-level" OR "temperature."

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