Financial Markets, Institutions & Instruments

WILEY

ORIGINAL ARTICLE OPEN ACCESS

Unravelling the Impact of Ideological Diversity on Stock Returns Amidst Uncertainty

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Received: 11 April 2025 | **Revised:** 16 May 2025 | **Accepted:** 4 June 2025

Keywords: agency theory, Covid-19 | firm resilience, ideological diversity, upper echelon theory

ABSTRACT

Recently, the Covid-19 uncertainties have raised interest in identifying factors that influence firms' resilience. Existing Covid-19 research primarily focused on market reactions and lockdown impacts, overlooking the influence of ideological diversity of firms' directors on resilience. To address this gap, we examine personal contributions to the US Republican or Democratic parties by 11,741 directors from 328 S&P 500 firms, revealing their political ideologies. Our findings highlight that firms with diverse boards experience milder stock return declines during the Covid-19 outbreak, indicating a positive link between ideological diversity and firm performance. This study presents evidence of the significant impact of ideological diversity in corporate boardrooms, showcasing how it affects firms' resilience during times of extreme market uncertainty. Our findings emphasise the importance of revisiting the theories to explain the ideological diversity in shaping strategies to respond to uncertainty during unpredictable times. Based on social psychological theory alongside agency theory, the findings provide clear indications to practitioners that during future uncertainties, the ideological diversity of the board should be considered to optimise the board's potential to improve performance.

JEL Classification: G34, M14

1 | Introduction

Can diverse board ideologies determine firm resilience or in other words, determine corporate stock return during uncertainties? To examine this question, in this study we examine impact of varying ideologies among directors on firm performance[1] during the SARS-CoV-2 (hereafter, Covid-19) market crash. Previous research has focused on the consequences of financial uncertainty (e.g., Henry et al. 2024) and financial crises (Huang et al. 2020; Lins et al. 2017; Rajan and Zingales 1998). However, there exist conceptual shortcomings about how such events influence a firm's resilience,[2] which remains prominent during Covid-19. On 12 March 2020, the World Health Organization (WHO) declared the Covid-19 outbreak a pandemic. By August 2021, the virus had claimed 618,363 lives in the United States, with 36,152,620[3] reported cases. These events significantly disrupted global economic activity (Baldwin and di Mauro 2020) and worldwide financial markets (Cao et al. 2020). Amid the Covid-19 pandemic, the S&P 500 Index, a crucial US financial indicator, plummeted around 41% from 19 February 2020, to 23 March 2020, only to rebound with record-breaking values like 4436.75 on 10 August 2021 (Yilmazkuday 2021). Firm's resilience played a crucial role in determining the firm performance. But which factors influenced the firm's resilience is yet to be examined. Covid-19 crisis differs from previous ones due to rapid financial challenges, disruptions in value chains, and business operation constraints during restrictions (Amore et al. 2022; Ding et al. 2021). Studies have explored factors affecting firms' performance

during the Covid-19 pandemic, for example, family ownership (Amore et al. 2022), corporate governance (El-Chaarani et al. 2022), environment and social stocks (Abedifar et al. 2023), financial institutions (Agoraki et al. 2024) and corporate traits (Ding et al. 2021; Albuquerque et al. 2020; Cheng 2020; and others). These investigations aimed to identify influential variables and initial pandemic response strategies across countries and industries (Ding et al. (2021). Firms with higher cash reserves and lower debt are more resilient to Covid-19 effects (Fahlenbrach et al. 2020). As a result, when some firms faced losses, others innovated by introducing new products/services to meet evolving consumer needs due to the pandemic (Li et al. 2021). Thus, it is evident that firm resilience determines corporate performance, even during uncertainty. From previous research, we know that different external factors to firms influence its resilience. For example, strong corporate governance enables quick responses to economic changes (Huang et al. 2020). However, recent research showed mixed results on the link between corporate performance and governance mechanisms (Chijoke-Mgbame et al. 2020), where some firms enhance governance amid ongoing challenges (Ding et al. 2021). The above evidence raises a question about the capacity of the theories in explaining the share price movement during Covid-19. It is evident that the shareholder-centered concept of separating ownership from control should be applied to avoid conflict even during Covid-19 (Jensen and Meckling 1976). But external factors shaping board composition like, workplace environment, social context and internal aspects are tied to cognitive biases and can influence the firm resilience (Hudson and Morgan 2022). Despite recognising directors' impact on firm performance (Chin et al. 2013), studies often neglect directors' cognitive perspectives, as noted by Gupta and Wowak (2017) and Shropshire (2010), which can be explained by the Upper Echelons theory. Some top management teams (TMT) research acknowledges internal factors, such as board political ideology[4] on TMT pay (Weng and Yang 2024; Boeker and Gomulya 2020; Chin and Semadeni 2017; Gupta and Wowak 2017; Di Giuli and Kostovetsky 2014). Ideology is not just belief but an active force shaping behaviour and interactions, which can be important in firm resilience during uncertainty. Political orientations reflect visible aspects of ideology linked to social and economic attitudes (Bonica 2016; Chin et al. 2013; Jost et al. 2009). These studies have shown that political orientations can provide valuable insights into the underlying beliefs and values that shape an individual's worldview. The liberal-conservative continuum is widely used due to its consistent nature (Jost 2006) and alignment with traits (Gerber et al. 2011), preconceptions (Fatke 2017), and values (Carney et al. 2008). It is a versatile framework across disciplines (Jost et al. 2009), impacting corporate goals. However, little is known about board ideology during a pandemic. Moreover, while other forms of diversity like gender, ethnicity, and so forth. contribute significantly to inclusivity and representation, ideological diversity uniquely influences the cognitive and strategic dimensions of decision-making, making it an indispensable component of effective crisis management (Solomon and Hall 2023). Thus, this study explores whether diverse board ideologies influence S&P 500 stock prices in uncertainty and moderate Covid-19 exposure's impact. Analysing 316 S&P 500 firms' data from January 2020 to January 2021, we integrate agency and social psychology theories. Findings show Covid-19 exposure and sentiment influence the decline in stock in Q2-Q4 2020. We also find that firms with high ideological diversity have a 2% improved return in the period under review than firms with lower board ideological diversity, that is, firms with high directors' heterogeneity performed better than more homogenous firms. Our paper closely aligns with Kara et al. (2022), who measure boardroom diversity through women's representation. We adopt political ideology as a proxy for diverse board perspectives, strengthening oversight. This work is linked to the concept that personal values impact corporate behaviour, expanding on research highlighting individual preferences' influence on financial choices beyond rational profit pursuit. In our contribution, we provide evidence that individual directors' viewpoints, assessed by political ideology, also shape share price resilience in times of uncertainty. We further demonstrate that the findings are robust to alternative methods and tests.

This article expands on the existing literature and introduces new insights. First, it adds to the growing body of research examining the financial consequences of the Covid-19 pandemic and other infectious diseases on firm stock prices (Albuquerque et al. 2020; Cheng 2020; Donadelli et al. 2017; Ding et al. 2020; Gormsen and Koijen 2020; Hassan et al. 2020). Second, this empirical investigation also contributes to the literature on the importance of board ideology diversity (see e.g., Kim et al. 2013; Bernile et al. 2018) in financial decision-making, leading to higher firm performance, especially during an uncertain event like a pandemic. Consequently, boards must be aware of any diversity gap, its reason and the likelihood of resolving their diversity issues and use that knowledge in developing the financial strategy during uncertainty.

The rest of the paper is organized as follows: Sections 2 explains the theoretical framework used to develop hypotheses. Section 3 discusses the methodology followed by Section 4 that presents empirical results and analyses and includes robustness tests, and Section 5 concludes the paper.

2 | Theoretical Framework and Hypotheses Development

2.1 | Theoretical Framework: Political Ideology Diversity and Share Price Resilience

Corporate leaders such as, executives, directors and managers are often modeled as rational, profit-maximising agents (Francia et al. 2003). Yet, their decisions reflect not only economic imperatives but also diverse political ideologies that shape firm behaviour and outcomes (Francia et al. 2003). Since Seider's (1974) Marx-Mannheim analysis revealed ideological variation among US managers, spanning neo-classical profit motives to social responsibility, scholars have explored how political ideology influences firms. Two research streams dominate: one examines individual actors' ideologies and their intra-firm behaviour (Mizruchi 1990), while the other investigates how collective firm ideologies drive strategic choices (Francia et al. 2003). Building on these foundations, this study proposes that ideological diversity among corporate leaders affects share price resilience, the capacity of a firm's stock to withstand or recover from economic shocks—through channels such as lobbying expenses, network cohesion and risk preferences. Upper Echelon Theory (UET) anchors this framework, capturing how leaders' cognitive biases, rooted in

ideology, shape firm responses to uncertainty (Hambrick and Mason 1984).

2.1.1 | Ideology as a Bonding Mechanism: Channels of Influence

Political ideology acts as a bonding mechanism, ensuring alignment within and across firms (Burris et al. 2005; Mizruchi 1990). A primary channel is lobbying expenses, through which firms translate ideological priorities into policy influence. Conservative-leaning boards may lobby for deregulation or tax relief, signaling stability to investors and enhancing share price resilience during volatility (Hutton et al. 2014). Conversely, liberal-leaning firms might prioritise environmental or social regulations, potentially increasing costs but bolstering resilience via reputational capital among socially oriented stakeholders. Political action committee (PAC) contributions and campaign donations amplify this effect, with ideological alignment often clustering by geography, industry or interfirm ties (Mizruchi 1990). A second channel, network cohesion, emerges from interlocking directorates and political affiliations. Burris et al. (2005) demonstrate that shared ideologies among directors create cohesion across firms, even though indirect ties, while Stark and Vedres (2012) link director interlocks to strategic partnerships in Hungarian firms. These networks enable coordinated responses—such as joint lobbying or resource sharing—that buffer share prices against shocks.

However, excessive ideological homogeneity may limit adaptability, whereas diversity could foster resilience through innovative strategies, albeit at the risk of decision-making friction. The third channel, risk preferences, reflects how ideology shapes strategic posture. Conservative leaders prioritise accountability, streamlined governance and shareholder value, favouring outcome-based metrics and avoiding risky policies like high leverage or aggressive R&D (Tetlock 2000; Hutton et al. 2014). Liberal leaders, by contrast, emphasise process accountability and may pursue riskier, stakeholder-oriented initiatives (Tetlock et al. 2013). These preferences, embedded in board beliefs, influence managerial incentives and firm policies, directly impacting resilience (Gupta and Wowak 2017).

2.1.2 | Theoretical Grounding: Beyond Agency to Upper Echelons

Agency Theory traditionally frames shareholder-director conflicts as rational misalignments (Eisenhardt 1989), but it struggles to explain psychological or ideological influences, especially in uncertain contexts (Deutsch 2005; Westphal and Zajac 1995). During economy-wide crises, directors' decision-making often aligns with their views on societal governance (Jost et al. 2009), transcending economic rationality. UET addresses this gap, positing that leaders' cognitive frameworks here, political ideologies filter environmental cues and guide strategic choices (Hambrick and Mason 1984). For instance, conservative boards may hoard cash to weather downturns, while liberal boards invest in stakeholder trust, each affecting share price stability differently. Lobbying expenses, as a proactive channel, amplify these ideological effects by shaping the external environment, either mitigating regulatory risks or exposing firms to political backlash.

2.1.3 | Ideology Diversity and Share Price Resilience

While prior studies link political ideology to firm performance (e.g., Kim et al. 2013; Lee et al. 2014), its role in share price resilience remains underexamined. This framework contends that ideological diversity influences resilience through: (1) lobbying expenses, which signal stability or adaptability to investors; (2) network cohesion, which enhances coordination and resource access and (3) risk preferences, which dictate strategic responses to uncertainty. These channels interact dynamically: ideologically aligned leadership may excel at lobbying but falter in innovation, while diverse boards might struggle with consensus yet excel in adaptive governance. By integrating UET, this study illuminates how cognitive and ideological factors underpin a firm's capacity to maintain or recover share value amid turbulence, offering a novel lens on resilience in corporate finance.

2.2 | Hypotheses Development

Social psychology research indicates board diversity's role in cultural stress responses (Rodriguez et al. 2007). Literature shows that ideology shapes information perception and response and signals a possibility of being used in strategic decision making during an uncertain event (Brochet et al. 2019; Nguyen et al. 2017). However, there is lack of empirical evidence on how the diverse board ideology could influence the firm resilience during an extreme uncertain event like Covid-19. In literature we find some evidence of key facts about ideology. For example, people reinforce beliefs through like-minded interactions (Harrison et al. 2002), ideological differences create distinct subgroups in groups (Harrison et al. 2002; Van Knippenberg et al. 2004), ideologies shape beliefs more than evidence (Knight 2006) and ideology is deeply rooted and affects inter-group dynamics (Olthuis and van den Oever 2020). The above findings in literature give us a clear hint that ideology could influence the collective decision-making process by a firm's board. However, as cognitive bias impact board processes and communication (van Ees et al. 2009; Jiang et al. 2018), there is a possibility that heterogeneity in ideology could be a tool to hinder consensus among the board members (Carter et al. 2010; Delis et al. 2016; Salloum et al. 2019; Van Knippenberg et al. 2004; Westphal and Milton 2000). The above argument is well supported by the underlying assumptions of the upper echelon theory. Another stand of literature shows that greater boardroom diversity, including viewpoints, information, and intellectual capital, positively impacts decision-making (Baranchuk and Dybvig 2009; Luckerath-Rovers 2013; Ntim 2015). Based on the principles of Agency theory, ideological differences could prompt re-adapted initiatives and better strategic decisions (Simons et al. 1999; Young et al. 2017). Similarities within subgroups and differences between enhanced behavioural learning, team learning and performance could lead to higher inclusion and acceptance of ideological diversity to enhance firms' resilience (Gibson and Vermeulen 2003). The complementary effect of the agency theory and the upper echelon theory creates an ideal space to examine how the ideological diversity

in the boardroom could enhances reflective thinking, higher engagement of the managers and better decision making, in other words, the firm resilience during the time of uncertainty. Based on the above argument, we propose the first hypothesis as follows:

Hypothesis 1. Board ideological diversity has a positive association with stock return during Covid-19.

Social psychology studies suggest that ideological diversity supports balanced decisions (Young et al. 2017), though the effects remain unclear. Political ideology plays a crucial role in decision-making by shaping information processing (Chan and Palmeira 2021; Jost et al. 2003). Jost et al. (2003) identify psychological factors predicting conservatism, with intolerance of ambiguity and closure are positively linked to conservatism, whereas openness to experience, and uncertainty tolerance are negatively associated with conservatism. Conservative ideology resists change and justifies inequality (Jost et al. 2003). Ideology acts as epistemic motivation, helping individuals position themselves and shape their reality (Federico and Goren 2009). Thus, political ideology shapes information processing and reality construction (Federico and Goren 2009). Amodio et al. (2007) find differing information processing between Democrat and conservative managers; conservative managers stick to judgments, while Democrat managers tolerate complexity and novelty (Amodio et al. 2007). According to the upper echelon theory, the above idiosyncratic characteristics of political ideology among board members could influence the firm resilience. Because of lack of empirical evidence, it is hard to conclude, if the resilience will be better off or be worst during an uncertain time in the global economy. Recent research has demonstrated that conservatives are more prone to disseminating misinformation than Democrats (Marwick and Lewis 2017). Attempting to understand the reason behind this, Vosoughi et al. (2018) posited that conservatives trust news outlets that have a notable presence of misinformation in their content, for instance, the Rush Limbaugh Show, Glenn Beck Program, Fox News and the Sean Hannity Show (Borah et al. 2022). Conversely, most democrats trust the New York Times, a renowned source recognised for its reliability and accuracy (Borah et al. 2022). Past research has confirmed that individuals may perceive information from in-group members and sources as more credible and accurate (Ardèvol-Abreu et al. 2017; Garrett 2019). According to the upper echelon theory, a firm's outcome depends on the background of the management (Weng and Yang 2024). Indeed, a large body of literature has examined the role political orientation plays in varying media effects, suggesting that the influences of communicative behaviours and psychological factors can be determined by the pre-existing ideology an individual hold (Narayan et al. 2021; Reedy et al. 2014). However, in any situation, the board will prefer to avoid conflict with shareholders as per the norms of the agency theory. Because of the negative global effect of the Covid-19, we expect firms to capitalise the higher ideological diversity to create positive stock return. Thus, we formulate the following hypothesis:

Hypothesis 2. Board ideological diversity moderates the relationship between Covid-19 exposure and stock return, i.e., as ideology diversity increases in the boardroom, the more robust the stock return.

3 | Methodology

3.1 | Sample and Data

This investigation utilised board of director data for S&P 500 companies for 2009–2021 from the Refinitiv database and integrated it with COVID_EXPOSURE[5] and COVID_NET_SENTIMENT[6] data from Hassan et al. (2020). Additional data encompassed corporate financials, stock markets and environmental, social and governance (ESG) data from Thomson Reuters Refinitiv (WorldScope and ASSET4), respectively. Political ideology measurements are derived from FEC-collected political donation data following Gupta and Wowak (2017). After eliminating observations with missing values for COVID_EXPOSURE, COVID_NET_SENTIMENT and control variables, the final sample comprise of 328 firms. The data is winsorised at the top and bottom 1% to mitigate outlier influence.

3.2 | Variable Description and Model Specification

3.2.1 | Stock Price Performance

Weekly stock data for S&P 500 firms in 2020 and Q1 2021 is obtained from Refinitiv, aligning with prior studies (Ding et al. 2021). Weekly Stock Return (Ret_{it}) is computed as:

$$Ret_{it} = \left[\left(\frac{TRI_{it}}{TRI_{i(t-1)}}\right) - 1\right] \quad (1)$$

Here, TRI_{it} represents the dividend-adjusted closing prices on the final trading day of the week. To validate findings, we also employ weekly price index returns as the dependent variable. Figure 1 displays stock market returns for each firm in the sample, spanning Q1 2020 to Q1 2021.

3.2.2 | Political Ideology

Accurate political ideologies of directors in our sample are essential for board ideology measurement. Following previous research, we examine director donations to US political parties (Chin et al. 2013; Hutton et al. 2014; Christensen et al. 2015). Democratic-Republican distinctions align with ideologies: Democrats lean liberal, Republicans conservative (Poole and Rosenthal 1984; Goren et al. 2009) and are supported by the proposed theoretical framework. Firms expecting benefits donate, but strong ideological convictions drive personal donations despite limited benefits (Ansolabehere et al. 2003; Francia et al. 2005; Grier et al. 1994). Donations advocate for candidates and values, collectively shaping politics (Hutton et al. 2014; Ansolabehere et al. 2003). Director political contribution data ($200+ donations: amount, date, recipient details) is collected from the FEC (Gupta and Wowak 2017). The process analysed political contribution data from the 2008 to 2020 US election cycles to capture directors' enduring political inclinations, utilising donations from 11,741 out of 23,482 directors to address the challenge of distinguishing genuine ideological alignment from assumed similarity (Huckfeldt and Sprague 1995; McPherson et al. 2001). Previous research is ambiguous regarding the basis

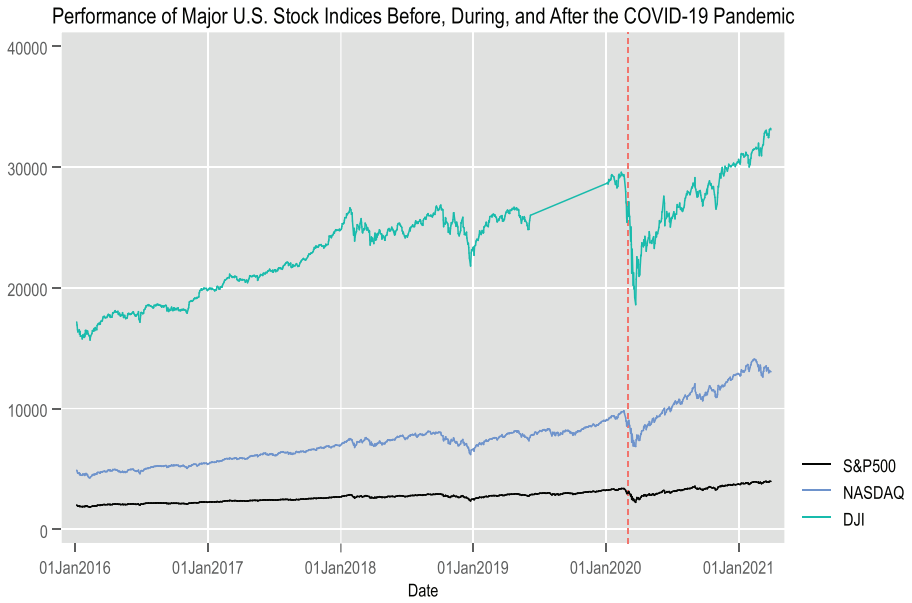

FIGURE 1 | The stock market, pre-Covid-19 exposure and post-Covid-19 exposure. It presents stock market performance for the most extensive US indexes; the S&P 500 is the index under review. [Color figure can be viewed at wileyonlinelibrary.com]

of shared ideological connections. To address this, donation data is collected to remove subjective self-reporting bias. Political donation figures are then used to compute diversity indices, aggregating contributions to both parties as per Hutton et al. (2014) creating an index based on contribution discrepancy. The focal variable is the board's ideological diversity, measured using a Herfindahl-based index, aligning with established literature (Alesina and La Ferrara 2005), indicating the probability of four randomly chosen directors holding differing ideologies.

$$\text{ID\_DIVERSITY} = 1 - \sum_{i=1}^{n} S^2 \tag{2}$$

where, S represents the proportion of directors for ideology i, while n signifies the distinct categories, such as Male and Female Democrats and Male and Female Republicans. The Herfindahl-based index, commonly used in assessing workgroup diversity (Harrison and Klein 2007), suits categorical variables where members belong to single categories. To address the skewness and kurtosis in the ideological diversity distribution, we addressed extremes at the 1st and 99th percentiles. The Herfindahl Index, typically employed in literature to gauge market concentration, offers an intriguing lens to explore ideological diversity among male and female Republicans and Democrats. Here, its application may reveal notable shortcomings. Political ideologies resist the neat, discrete categorisation the Herfindahl Index demands, sprawling across a spectrum that defies simple labels like '*conservative*' or '*democrats*'. Assigning precise proportions to these amorphous groups proves challenging, as donation records may fail to capture the full richness of individual convictions, risking oversimplification or distortion. To bolster or refine our approach, alternative methods can illuminate what the Herfindahl Index obscures. For instance, Cluster analysis, applied to survey responses or parsed political rhetoric from social media platforms like X, could organically group individuals by their beliefs across multiple dimensions, offering a validation check against the findings. Principal component analysis to peel back the layers of variation, pinpointing the ideological fault lines driving diversity within each cohort, and the Shannon Entropy Index, with its focus on distributional evenness, might serve as a counterpoint to the Herfindahl's emphasis on concentration, testing whether diversity is broad or skewed.

3.2.3 | Model Specifications

The baseline model used in this research is as follows:

$$\begin{aligned} TRI_{it} = {} & \alpha + \beta_1(\text{ID\_DIVERSITY})_{it} + \beta_2(\text{COVID\_EXPOSURE})_{it} \\ & + \beta_3(\text{COVID\_NET\_SENTIMENT})_{it} + \beta_4 X_{it} \\ & + \sum_j \gamma_j Industry_j + \sum_t \delta_t Quarter_t + \varepsilon_{it} \end{aligned} \tag{3}$$

The dependent variable, *TRI*, represents the cumulative weekly return of firm i in quarter t. ID_DIVERSITY is the Herfindahl-based index indicating the probability of four randomly chosen directors holding differing ideologies. COVID_EXPOSURE is the number of times Covid-19, and its synonyms are used in the earnings transcript, scaled by the number of sentences in the transcript. COVID_NET_SENTIMENT is the difference in the number of negative or positive tone words (associated with COVID-19 and its believed effect on the firm's future cash flows and investment risk) used in the earnings transcripts. X_{it} is the vector of firm-level control variables[7] such as CASH_HOLDING, FIRM_SIZE, BOARD_SIZE, LEVERAGE, PROFITABILITY, PCNT_WOMEN, AVG_AGE. $Quarter_t$ is the time dummy variables and $Industry_j$ are the industry dummy variables based on Fama-French 48 industry classification.

TABLE 1 | Summary statistics.

	Mean	St.Dev	p25	Median	p75	Min	Max
COVID_EXPOSURE	1.23	1.30	0.29	0.91	1.71	0	8.87
COVID_NET_SENTIMENT	−0.10	0.48	−0.24	0	0.09	−5.57	2.37
TRI	0.09	0.43	−0.18	−0.04	0.20	−0.43	1.42
CASH_HOLDING	0.12	0.13	0.03	0.08	0.17	0.01	0.45
LEVERAGE	0.30	0.16	0.17	0.31	0.42	0.03	0.61
FIRM_SIZE	17.00	1.20	16.10	16.86	17.82	15.07	19.49
BOARD SIZE	2.32	.20	2.20	2.40	2.49	1.10	2.83
ID_DIVERSITY	0.23	0.21	0	0.22	0.44	0	0.75
ESG	5.17	.33	5.02	5.27	5.40	3.70	5.62
PROFITABILITY	0.12	0.07	0.07	0.11	0.17	−0.08	0.26
PCNT_WOMEN	0.25	0.10	0.18	0.25	0.30	0	0.67
AVE_AGE	62.20	3.42	60	62	64	50	78

Note: This table reports the summary statistics of the key variables used in the analyses. Also reported is the variable's value at the 25th, 50th (median), and 75th percentile of the distribution of the variable. All the variables are defined in Appendix 1.

4 | Empirical Results

4.1 | Descriptive Statistics and Correlation

Table 1 demonstrates the firms' market returns range from −0.43 to 1.42 with a mean of −0.036. ID_DIVERSITY shows a mean of 0.23 and a standard deviation of 0.21. Considering that ID_DIVERSITY conceivably ranges from 0 to 1, the observed large dispersion in the measure of diversity across the sample firms suggests that in the S&P 500 firms, more significant majority of the directors belong to a specific ideology group (Male—REPUBLICANS). In contrast, several directors (Male and Female) have different ideologies. as shown in Figure 2.

Table 2 reports the findings of Pearson correlational analysis. It shows that all the variables have correlation coefficients very low (below 0.5). Thus, variables are weakly or moderately related to each other. The Multicollinearity is unlikely because each predictor variable's variance inflation factor (VIF) and tolerance scores are well below 10.

4.2 | Multivariate Results

The evidence in Columns (3), (6) and (7) of Table 3 shows that higher board ID_DIVERSITY is linked with positive stock return ($\beta = 0.227$, $t = 3.20$; $\beta = 0.135$, $t = 1.68$; $\beta = 0.136$, $t = 1.68$). The findings support Hypothesis 1, that a more heterogeneous group would make more informed decisions, reflected in stock market return. While the significance levels of the coefficients provide statistical evidence of relationships, the practical significance of these relationships can be better understood through an effect size analysis.[8] By employing Cohen (1992) f^2 as a measure of effect size, we can evaluate the extent to which each variable influence stock market returns. COVID_NET_SENTIMENT ($f^2 = 18.8$) had a significant impact on stock performance, indicating that shifts in investor sentiment, driven by media, public health updates, and policies, strongly influenced returns. Firms facing negative sentiment saw substantial stock declines, emphasising the need to manage public perception during crises.

COVID_EXPOSURE ($f^2 = 16.5$) also had a large effect, showing that industries like travel, hospitality, and retail, highly exposed to pandemic risks, faced major market reactions. Investors may prioritise resilience when making decisions, highlighting the importance of proactive risk management and clear communication to mitigate negative market responses. ID_DIVERSITY ($f^2 = 14.4$) significantly influenced stock returns, with firms having diverse boards perceived as better equipped to handle uncertainty. This underscores investor preference for diversity in governance, linking it to improved strategic decision-making, corporate governance and adaptability to market shocks.

The results in Table 3 column (8) indicate that COVID-19-related factors, such as sentiment and exposure, had the strongest influence on stock market performance, emphasising the critical role of macroeconomic shocks in financial markets. Board diversity also emerged as an influential variable, suggesting that firms with inclusive leadership structures were perceived more favorably by investors. Meanwhile, board attributes and traditional firm-level financial indicators, such as board size average age of directors, firm size, cash holdings, leverage, profitability had relatively lower practical significance, highlighting the importance of strategic and external factors in driving stock market movements. To enhance the explanatory power of the model and better capture the underlying dynamics, incorporating interaction effects could provide additional insights. Given the significant impact of COVID_NET_SENTIMENT and COVID_EXPOSURE, an interaction term between these two variables could be tested to determine whether investor sentiment amplifies or mitigates the adverse effects of exposure to the pandemic. Additionally, considering an interaction between ID_DIVERSITY and both COVID_EXPOSURE and COVID_NET_SENTIMENT could be valuable in determining whether board diversity moderates the negative effects of pandemic exposure and sentiment on stock returns. Firms with higher diversity may be better equipped to

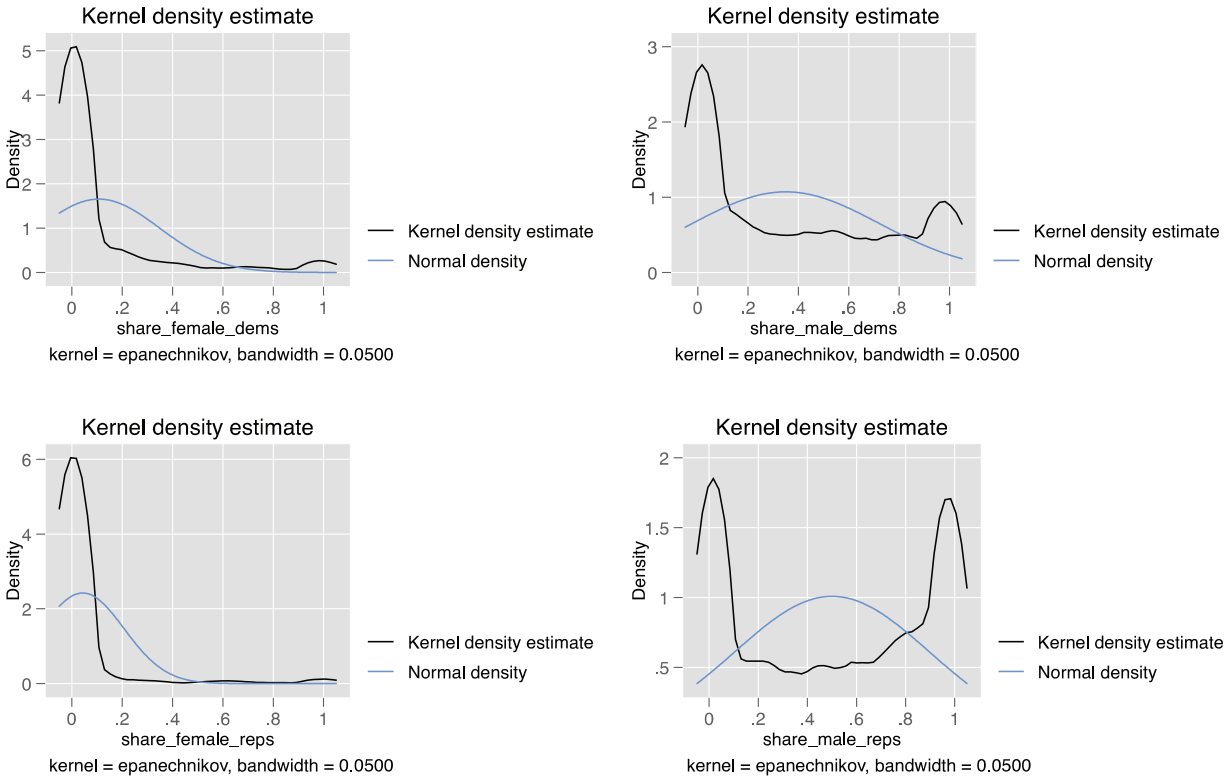

FIGURE 2 | Ideology diversity densities. It shows kernel density curves of the board of directors' ideologies for firms in our sample. [Color figure can be viewed at wileyonlinelibrary.com]

handle crises, potentially influencing how stock prices respond to external shocks. Including these interaction terms could further refine the understanding of how firm-level characteristics interact to shape stock market performance in response to external disruptions.

The results in Column 7 of Table 3 may be skewed due to omitted variables and the endogenous nature of CG mechanisms. One can easily imagine the endogeneity bias going either way, contingent on how board ID_DIVERSITY influences the decision-making process. Conversely, if ID_DIVERSITY disrupts or delays the deliberation process and makes the ensuing results more unpredictable (Arrow 1951), firms operating in a high Covid-19 EXPOSURE environment may find it beneficial to have less diversity on the board.

The results presented in Table 4 provide insight into the relationship between stock market returns and key interaction effects involving COVID_EXPOSURE, COVID_NET_SENTIMENT and ID_DIVERSITY. The analysis, based on pooled OLS regression, examines the impact of these factors on S&P 500 stock returns across four quarters in 2020 and the first quarter of 2021, while controlling for firm-specific and industry factors. The findings suggest that COVID_EXPOSURE had a significantly negative impact on stock returns across all three model specifications. The coefficient for COVID_EXPOSURE remained consistently negative ($\beta = -0.0524$, $t = -5.26$ -0.0606, $t = -4.03$ and -0.0499, $t = -4.87$) and highly statistically significant at the one percent level, indicating that firms with greater exposure to the pandemic experienced a sharper decline in stock performance. This result is consistent with (Hassan et al. 2020) amongst others that highlights the adverse effects of pandemic-induced disruptions, heightened uncertainty and macroeconomic volatility on firm valuation and investor confidence. The magnitude of the effect varied slightly across the models, but the overall implication remained robust.

Similarly, the findings underscore the role of investor sentiment in shaping market dynamics during the COVID-19 period. The coefficient for COVID_NET_SENTIMENT was also negative and statistically significant in all models ($\beta = -0.170$, $t = -2.88$, -0.118, $t = -3.87$and -0.173, $t = -3.99$), reinforcing the argument that heightened negative sentiment surrounding the pandemic contributed to a decline in stock returns (Hassan et. 2020). The results align with extant literature (Donadelli et al. 2017), which suggest that investor sentiment plays a critical role in influencing market trends and stock price fluctuations, particularly during periods of uncertainty. The strength of this negative association indicates that firms more susceptible to negative market sentiment faced steeper declines, exacerbating the broader economic uncertainty driven by the pandemic.

The interaction between COVID_EXPOSURE and ID_DIVERSITY, introduced in Column (2), yielded a positive coefficient ($\beta = 0.035$, $t = 0.78$), though it did not reach conventional levels of statistical significance. While the direction of the effect suggests that firms with greater ideological diversity may have exhibited a degree of resilience to direct COVID-19 exposure, the lack of statistical significance prevents a definitive conclusion. Nonetheless, the positive coefficient lends partial support to Hypothesis 2 that firms with more diverse leadership structures are better equipped to manage crises through

TABLE 2 | Correlation table.

Variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
COVID_EXPOSURE	1											
COVID_NET_SENTIMENT	−0.16***	1										
TRI	−0.08***	−0.10***	1									
CASH_HOLDING	0.08***	0.00	−0.055**	1								
LEVERAGE	−0.04*	−0.03	0.063***	−0.163***	1							
FIRM_SIZE	−0.03	0.03	0.028	−0.151***	−0.118***	1						
BOARD SIZE	0.00	0.05**	0.063***	−0.005	−0.033	−0.014	1					
ID_DIVERSITY	0.06**	−0.01	0.083***	0.012	−0.004	−0.072***	0.208***	1				
ESG	0.01	0.01	−0.024	−0.069***	0.127***	0.308***	−0.001	−0.013	1			
PROFITABILITY	0.01	−0.02	−0.005	0.263***	0.169***	−0.404***	−0.002	0.039	−0.060**	1		
PCNT_WOMEN	0.08***	0.06**	0.090***	0.011	0.006	0.078***	0.180***	0.111***	0.041*	−0.078***	1	
AVE_AGE	0.03	−0.03	0.069***	0.061**	0.015	0.034	−0.014	−0.025	0.081***	−0.011	−0.054**	1

Note: ***, **, *, representing 0.1%, 5%, and 1% significance levels, respectively.

adaptive decision-making and enhanced strategic flexibility. A more compelling result emerges in the interaction between COVID_NET_SENTIMENT and ID_DIVERSITY. The coefficient for this interaction term is positive (β = 0.211, t = 1.72) and statistically significant at the 5% level, suggesting that firms with more ideologically diverse leadership teams were better positioned to withstand the adverse effects of negative investor sentiment during the pandemic. This finding provides strong support for the hypothesis that diversity in decision-making enhances resilience in times of crisis. One possible explanation is that diverse leadership encourages a broader range of perspectives, which, in turn, may mitigate the psychological and strategic biases that often accompany crisis-driven decision-making. Firms with greater ideological diversity may have been able to balance short-term market concerns with long-term strategic imperatives, thereby reducing investor anxiety and stabilising stock performance.

The interaction between COVID_EXPOSURE and COVID_NET_SENTIMENT, while positive, (β = 0.133, t = 1.01) did not reach statistical significance. This suggests that while both exposure and sentiment independently contributed to declines in stock returns, their combined effect did not exhibit a reinforcing or mitigating relationship strong enough to register as statistically meaningful. While this result may appear inconclusive, it nonetheless indicates that the relationship between pandemic-induced exposure, market sentiment and firm performance is complex and likely influenced by additional firm-specific and macroeconomic factors. The analysis further reveals that the direct effect of ideological diversity on stock performance varied in significance across model specifications. In column (3), the coefficient for ID_DIVERSITY was positive and statistically significant (β = 0.164, t = 1.91), suggesting that firms with higher levels of diversity performed better in the stock market. This finding aligns with the broader literature on corporate governance (Coles 2008; Carter et al. 2010; Dellis et al. 2016), which argues that diversity in leadership enhances decision-making quality, strategic agility and risk management. While not consistently significant across all specifications, the positive coefficient suggests that diverse leadership may provide firms with structural advantages that contribute to resilience during periods of market distress.

Figure 3A,B derived from the interaction effects, graphically confirm our Hypothesis 2 indicating that boards with greater ideological diversity exhibit higher TRI levels than ideologically homogenous boards.

4.3 | Robustness Tests

4.3.1 | Omitted Variable Bias: 2SLS Regression

We perform several additional tests to ascertain the robustness of our findings. First, we examine potential endogeneity due to omitted variables (Semadeni et al. 2014), we referred to empirical (Boone et al. 2007; Coles et al. 2008; Linck et al. 2008) and theoretical works (Hermalin and Weisbach 1998; Raheja 2005; Adams and Ferreira 2007; Harris and Raviv 2008). We use the Environmental Social & Governance Pillar (ESG) score of the firms and demographic attributes of the directors as instruments (Chin et al. 2013, 2017; Hutton et al. 2014) Intuitively,

TABLE 3 | Impact of board's ideological diversity on stock return.

Dependent variable	S&P 500 Stock Market Return Q1 - Q4 2020 and Q1 2021							
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	f^2
COVID_EXPOSURE	−0.0372***			−0.0339**			−0.0301*	16.45
	(0.0109)			(0.0147)			(0.0154)	
COVID_NET_SENTIMENT		−0.108***			−0.0816***		−0.0825***	18.80
		(0.0296)			(0.0289)		(0.0289)	
ID_DIVERSITY			0.227***			0.135*	0.136*	14.44
			(0.0710)			(0.0802)	(0.0807)	
CASH_HOLDING				−0.161*	−0.187**	−0.162*	−0.155	4.89
				(0.0865)	(0.0871)	(0.0949)	(0.0944)	
FIRM_SIZE				0.00825	0.00887	0.00734	0.00936	0.61
				(0.0126)	(0.0127)	(0.0136)	(0.0136)	
BOARD SIZE				0.0572	0.0739	0.172*	0.186**	0.42
				(0.105)	(0.107)	(0.0914)	(0.0909)	
LEVERAGE				0.109**	0.105**	0.139***	0.137***	7.90
				(0.0461)	(0.0456)	(0.0504)	(0.0494)	
PROFITABILITY				0.0207	0.0156	−0.0820	−0.0882	0.02
				(0.165)	(0.166)	(0.174)	(0.173)	
PCNT WOMEN				0.481***	0.480***	0.327**	0.350**	13.42
				(0.156)	(0.156)	(0.158)	(0.157)	
AVE_AGE				0.00315	0.00292	0.00239	0.00261	0.50
				(0.00529)	(0.00530)	(0.00563)	(0.00560)	
Constant	0.159***	0.102***	0.0719***	0.361	0.319	0.141	0.0529	
	(0.0195)	(0.0144)	(0.0226)	(0.554)	(0.560)	(0.467)	(0.464)	
Observations	1850	1850	1607	1621	1621	1431	1431	
R-squared	0.006	0.007	0.006	0.295	0.295	0.288	0.292	
FF48 and quarter-year effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	

Note: The table presents the pooled OLS with firm and quarter fixed effect. COVID_EXPOSURE is the number of times COVID-19 and its synonyms are used in the earnings conference call between the board and investors, scaled by the number of sentences in the transcript. COVID_NET_SENTIMENT is the difference in the number of negative or positive tone words (associated with COVID-19 and its believed effect on the firm's future cash flows and investment risk) used in the earnings conference call between the board and investors. FF48 refers Fama-French 48 industry classification, using SIC codes. Quarter-year fixed effects capturing the calendar quarter (e.g., 2020Q1, 2020Q2, etc.). Heteroskedasticity robust standard errors are shown in parentheses. ***, **, *, representing 0.1%, 5%, and 1% significance levels, respectively.

if the ID_DIVERSITY is endogenous, its interaction(s) with COVID_EXPOSURE and COVID_NET_SENTIMENT is also expected to be endogenous. Hence, we use first-stage models, with ID_DIVERSITY and its interaction(s) with COVID_EXPOSURE and COVID_NET_SENTIMENT as the respective outcome variables. The estimated values of the ID_DIVERSITY and the interaction term from the first-stage models are used in the second stage. Table 5 shows results for the 2SLS (IV) estimation. Panel A presents results from the first-stage models of the 2SLS (IV) estimation, including the interaction of the instrument, instrumented ID_DIVERSITY with COVID_EXPOSURE & COVID_NET_SENTIMENT, because if W1 is the instrument for Y, therefore, the instrument for X*Y (W2) = W1*X. The study also tested the power and instrument validity before accepting the specification's 2SLS (IV) treatment of endogeneity. In addition, the instrumental variable approach, at least, can address potential concerns about reverse causality where the firm's needs can affect its actors' political tilt and contributions—together with all controls. In the second stage, Panel B, we use the predicted ID_DIVERSITY, ID_DIVERSITY*COVID_EXPOSURE and ID_DIVERSITY* COVID_NET_SENTIMENT from the first-stage regression as the key explanatory variables in the second-stage regression, where the dependent variable is the cumulative weekly return of firm *i* in quarter *t*.

To evaluate the instrument's explanatory value, the study conducted a partial F-test (Cragg-Donald Wald) on the first-stage equations, and the results are well above the recommended minimum of 10 (Stock and Yogo 2005), as shown in Panel B of Table 5, suggesting that the chosen instruments are a good predictor. The Sagan statistic (overidentification test) shows that the instruments are not correlated with the error term (p =

TABLE 4 | Moderation effect tests.

Dependent variable	S&P 500 Stock Market Return Q1—Q4 2020 and Q1 2021		
	(1)	(2)	(3)
COVID_EXPOSURE	−0.0524***	−0.0606***	−0.0499***
	(0.00996)	(0.0150)	(0.0102)
COVID_NET_SENTIMENT	−0.170***	−0.118***	−0.173***
	(0.0592)	(0.0305)	(0.0434)
COVID_EXPOSURE * ID_DIVERSITY		0.0350	
		(0.0451)	
COVID_NET_SENTIMENT * ID_DIVERSITY			0.211*
			(0.122)
COVID_EXPOSURE * COVID_NET SENTIMENT	0.0133		
	(0.0131)		
ID_DIVERSITY		0.0900	0.164*
		(0.117)	(0.0859)
Constant	−1.635***	−2.037***	−2.024***
	(0.543)	(0.443)	(0.444)
Observations	1634	1444	1444
R-squared	0.079	0.080	0.081
Firm-level controls	Included	Included	Included
FF48 and quarter-year effects	Yes	Yes	Yes

Note: The table presents the pooled OLS with firm and quarter fixed effects. COVID_EXPOSURE is the number of times COVID-19 and its synonyms are used in the earnings conference call between the board and investors, scaled by the number of sentences in the transcript. COVID_NET_SENTIMENT is defined as the difference in the number of negative or positive tone words (associated with COVID-19 and its believed effect on the firm's future cash flows and investment risk) used in the earnings conference call between the board and investors. All the firm-level controls are included in Table 3. FF48 refers Fama-French 48 industry classification, using SIC codes. Quarter-year fixed effects capturing the calendar quarter (e.g., 2020Q1, 2020Q2, etc.). Heteroskedasticity robust standard errors are shown in parentheses. ***, **, *, representing 0.1%, 5%, and 1% significance levels, respectively.

0.9137). Columns 1 and 2 of Panel B (Table 5) show that the second stage of 2SLS (IV) estimation of the coefficients of instrumented ID_DIVERSITY and their interaction(s) ID_DIVERSITY with COVID_EXPOSURE is positive and statistically significant. Therefore, firms with a more diverse board in terms of ideology will experience less stock market decline than firms with less diverse boards. Further, it supports research on board diversity (see, e.g., Bernile et al. 2018; Kim et al. 2013), who argue, among other things, that diverse corporate boards are linked with better firm performance. The findings are based on the theoretical underpinning of the UET and agency theory. The study finds that the interaction between ID_DIVERSITY and COVID_NET_SENTIMENT is positive but significant (0.216, p = <0.05). Furthermore, the Durbin-Wu-Hausman test for endogeneity (p = 0.30, 0.25 and 0.30) does not reject the null hypothesis that ID_DIVERSITY and its interactions with COVID_EXPOSURE and COVID_NET_SENTIMENT are exogenous and, as such, renders 2SLS regression unnecessary (Gupta and Wowak 2017; Wooldridge 2013).

We further provide justification for the selection of instrumental variables, demonstrating their exogeneity using additional diagnostic tests. We employ the instrumental variable free Gaussian Copula approach (Gill 2024). The Gaussian Copula method provides a sophisticated approach to mitigating endogeneity concerns without the reliance on instrumental variables. Rather than depending on external instruments, this method constructs a correction term by estimating the correlation between the endogenous variables, which is ID diversity, and the regression error term, thereby capturing the underlying dependence structure in a statistically rigorous manner (Park and Gupta 2012). By leveraging copula-based modelling, this approach circumvents the limitations associated with instrumental variable techniques, offering a flexible and robust alternative for addressing endogeneity. A central feature of the Gaussian Copula approach is the integration of an additional '*copula*' term within the primary regression framework. This term facilitates the explicit modeling of the correlation between ID diversity and the error term, ensuring that the estimation process accounts for any unobserved confounding influences that may bias the results (Gill 2024; Park and Gupta 2012). By embedding this term within the regression model, the methodology improves statistical reliability, reducing potential distortions caused by endogeneity. The construction of this correction term follows a structured sequence of computational steps. First, it requires the estimation of the cumulative density function (CDF) of ID diversity to determine its probability distribution. Once this distribution is established, the next step involves computing the inverse normal transformation, which standardizes the term, ensuring it aligns with a normal distribution. With this newly derived component incorporated

TABLE 5 | 2SLS Instrumental variable regression to address omitted variable bias.

Panel A First-stage regressions

	Dependent variable		
	ID_DIVERSITY	ID_DIVERSITY * COVID_EXPOSURE	ID_DIVERSITY * COVID NET SENT.
	(1)	(2)	(3)
ESG	0.188***		
	(0.0278)		
ESG * COVID_EXPOSURE		0.123***	
		(0.00352)	
ESG * COVID_NET_SENTIMENT			0.113***
			(0.00252)
AVE_AGE	0.0621***	0.0688***	−0.0202***
	(0.00697)	(0.0137)	(0.00399)
PCNT_WOMEN	0.000906*	0.00297***	0.000503*
	(0.000546)	(0.00107)	(0.000312)
Constant	−0.353***	−0.401**	0.0293
	(0.111)	(0.171)	(0.0497)
Observations	1637	1637	1637
R-squared	0.220	0.527	0.571
Firm-level controls	Included	Included	Included
FF48 and quarter-year effects	Yes	Yes	Yes

Notes: ESG is the overall firm score is calculated using disclosed data and the ESG pillar ratings. ***, **, *, representing 0.1%, 5%, and 1% significance levels, respectively.

Panel B 2nd Stage Regressions

	Dependent variable: S&P 500 Stock Market Return Q1—Q4 2020 & Q1 2021		
	(1)	(2)	(3)
ID_DIVERSITY (INSTR.)	0.188**		
	(0.0910)		
COVID_EXPOSURE		−0.0146***	
		(0.0259)	
COVID_NET_SENTIMENT			−0.109*
			(0.1187)
ID_DIVERSITY (INSTR.) * COVID_EXPOSURE		0.0752*	
		(0.0389)	
INSTR. ID_DIVERSITY *COVID_NET_SENTIMENT			0.216**
			(0.104)
Firm-level controls	Included	Included	Included
FF48 and quarter-year effects	Yes	Yes	Yes
Cragg-Donald Wald F statistic	1203.668	645.018	771.99
Durbin-Wu-Hausman *p* value	0.3040	0.2457	0.3095
Sargan statistic	0.00	0.00	0.00
Constant	−0.329	−0.300	−0.325

(Continues)

TABLE 5 | (Continued)

Panel B 2nd Stage Regressions			
	Dependent variable: S&P 500 Stock Market Return Q1—Q4 2020 & Q1 2021		
	(1)	**(2)**	**(3)**
	(0.322)	(0.321)	(0.323)
Observations	1132	1132	1132
R-squared	0.335	0.336	0.332

Note: The table presents the second stage of 2SLS regression. COVID_EXPOSURE is the number of times COVID-19 and its synonyms are used in the earnings conference call between the board and investors, scaled by the number of sentences in the transcript. COVID_NET_SENTIMENT is defined as the difference in the number of negative or positive tone words (associated with COVID-19 and its believed effect on the firm's future cash flows and investment risk) used in the earnings conference call between the board and investors. All the firm-level controls are included as in Table 3. FF48 refers Fama-French 48 industry classification, using SIC codes. Quarter-year fixed effects capturing the calendar quarter (e.g., 2020Q1, 2020Q2, etc.). Heteroskedasticity robust standard errors are shown in parentheses. ***, **, *, representing 0.1%, 5%, and 1% significance levels, respectively.

TABLE 6 | Instrumental variable free Gaussian Copula approach.

Dependent variable	**S&P 500 Stock Market Return Q1—Q4 2020 and Q1 2021**		
	(1)	**(2)**	**(3)**
# Bootstrap replications:	1000	1500	2000
ID_DIVERSITY	0.206***	0.206***	0.206***
	(0.0776)	(0.0773)	(0.0771)
COVID_NET_SENTIMENT	−0.116**	−0.116*	−0.116**
	(0.0593)	(0.0594)	(0.0591)
COVID_EXPOSURE	−0.0403**	−0.0403**	−0.0403**
	(0.0177)	(0.0173)	(0.0172)
COPULAR_FACTOR	−0.0134	−0.0134	−0.0134
	(0.0389)	(0.0386)	(0.0383)
Constant	−1.419***	−1.419***	−1.419***
	(0.339)	(0.338)	(0.335)
Observations	1482	1482	1482
R-squared	0.075	0.075	0.075
Firm-level controls	Included	Included	Included
FF48 and quarter-year effects	Yes	Yes	Yes

Note: The table presents Instrumental variable free Gaussian Copula approach. COVID_EXPOSURE is the number of times COVID-19 and its synonyms are used in the earnings conference call between the board and investors, scaled by the number of sentences in the transcript. COVID_NET_SENTIMENT is defined as the difference in the number of negative or positive tone words (associated with COVID-19 and its believed effect on the firm's future cash flows and investment risk) used in the earnings conference call between the board and investors. All the firm-level controls are included as in Table 3. FF48 refers Fama-French 48 industry classification, using SIC codes. Quarter-year fixed effects capturing the calendar quarter (e.g., 2020Q1, 2020Q2, etc.). Heteroskedasticity robust standard errors are shown in parentheses. ***, **, *, representing 0.1%, 5%, and 1% significance levels, respectively.

into the regression model, the extended baseline model can be estimated, allowing for a more accurate assessment of the impact of ID diversity on stock market returns. The results from Table 6 indicate a statistically significant positive relationship between ID_DIVERSITY and stock performance, as evidenced by an estimated coefficient of (β = 0.206), which remains significant at the 1% level across different bootstrap replications (1000, 1500 and 2000). This finding suggests that increased ID diversity positively impacts stock market returns. Additionally, the COVID_NET_SENTIMENT variable exhibits a negative and statistically significant impact on stock performance, with coefficients (β = −0.116), similarly, COVID_EXPOSURE shows a negative effect (β = −0.0403), also significant at the 5% level, indicating that increased exposure to COVID-19 negatively influenced stock market returns during the analysed period. The Copular Factor, which captures potential endogeneity, is found to be statistically insignificant, suggesting that the relationship between ID diversity and stock performance is robust and not

TABLE 7 | Propensity score matching.

Propensity score matching—First stage	
	ID_DIVERSITY
CASH_HOLDING	0.192***
	(0.0579)
PROFITABILITY	0.170*
	(0.0896)
FIRM_SIZE	0.0119**
	(0.00468)
J[13]	1.430***
	(0.342)
Constant	0.250***
	(0.0888)
R-squared	0.048
Observations	1494

Note: Heteroskedasticity robust standard errors are shown in parentheses. ***, **, *, representing 0.1%, 5%, and 1% significance levels, respectively.

driven by endogeneity concerns. The constant term remains negative and highly significant (β = –1.419), reinforcing the presence of underlying market conditions affecting stock returns. These findings confirm that ID diversity remains a significant determinant of stock market returns, even when controlling for potential endogeneity, COVID-related sentiment, and exposure effects. Also, we employ the propensity score matching as a substitute method of accounting for endogeneity that does not necessitate the use of additional instruments.

4.3.2 | Propensity Score Matching

There is still a possibility that performance differences during the pandemic are driven by other unobserved firm-level characteristics that our resilience measure does not capture. Therefore, the study performs the propensity score matching (PSM) to construct samples of similar firms (using pre-pandemic observables) with high and low ID_DIVESRITY firms. A firm is defined as high ID_DIVESRITY if it has < than the median ID_DIVESRITY value; otherwise, it is defined as low ID_DIVESRITY. By generating and comparing matched pairs, we aim to reduce the bias due to confounding variables in the ID_DIVESRITY estimate of the high diversity group, such that we have more confidence to conclude that the difference between the matched firms results from different diversity levels. We match each high-diversity firm with a control firm in the same industry classification by requiring the exact matching for the industry membership. We use nearest neighbor matching based on propensity scores (PS), generated based on a logit regression on the variables that might affect a company's market returns, such as FIRM_SIZE, the measure of firm profitability, leverage and cash holding. To improve the model, we added the factor variables for leverage*profitability and cash holding*profitability.[9] The PSM is produced with replacement and a standard caliper.01. In the tabulated results (see Table 7) for the logit regression, we find that firm size, cash holding, profitability and cash holding*profitability load have a positive and significant coefficient. Figure 4 shows the matching quality and results. For most of the confounding variables used in the PSM, the low ID_DIVESRITY group looks much more similar to the high ID_DIVESRITY group, as reflected in the mean estimates. Table 8 presents the standardised difference (Rosenbaum and Rubin 1985), that is, the difference in terms of standard deviation. All confounding variables used to calculate the propensity score have a standardised bias of less than 0.1, indicating successful matching. In other words, the high ID_DIVERSITY group and the matched group are very similar in terms of their firm size, the measure of firm profitability, leverage and cash holding.

With the matched samples, we can compare the stock market return during crises for the high ID_DIVERSITY group and the matched group. We have more confidence that the difference between the two groups is likely due to firms' different diversity levels and no other covariates. Sensitivity test results, as shown in Table 9 suggest that there is an economically meaningful and statistically significant difference in stock market return, about 0.06% (p = <0.01), between the high ID_DIVESRITY group and the matched group during the period in review 2020Q1 to 2021Q1, suggesting that in the treatment group, the stock market return will improve by 0.06% for a one standard deviation increase in board ideology diversity (ID_DIVERSITY).

4.3.3 | Entropy Balancing Estimations

Our design decisions can significantly influence the comparison between non-diverse and diverse boards, potentially introducing additional bias. To address this, we employ entropy balancing following Hainmueller (2012). This method helps mitigate the risk by ensuring a balanced distribution of covariates between boards with varying levels of ideological diversity without reducing the number of observations (Chantziaras et al. 2020; Chapman et al. 2019). Table 10 displays statistics for the entropy-balanced sample, encompassing mean, variance and skewness. After consolidating the matched pairs into a unified dataset, we perform OLS regression. In Panel B of Table 10, our findings strongly suggest a positive correlation between the diversity of board members' ideologies and share price performance.

4.3.4 | Establishing Causality—Lagged Independent Variables

We also test endogeneity as a key concern particularly when dealing with simultaneity, where the relationship between variables is bidirectional. In this case, stock market performance may influence ID diversity, while ID diversity may also affect stock market performance. To mitigate this issue, we employ lagged explanatory variables, following Kim et al. (2018) which serve as a methodological solution by ensuring that the independent variables are predetermined and not contemporaneously correlated with the error term. This strengthens the causal inference of ID_DIVERSITYs impact on stock market performance. The regression results in Table 11 indicate that lagged ID_DIVERSITYs has a positive and statistically significant effect on stock market returns (β = 0.156, t = 1.69). This finding suggests that higher

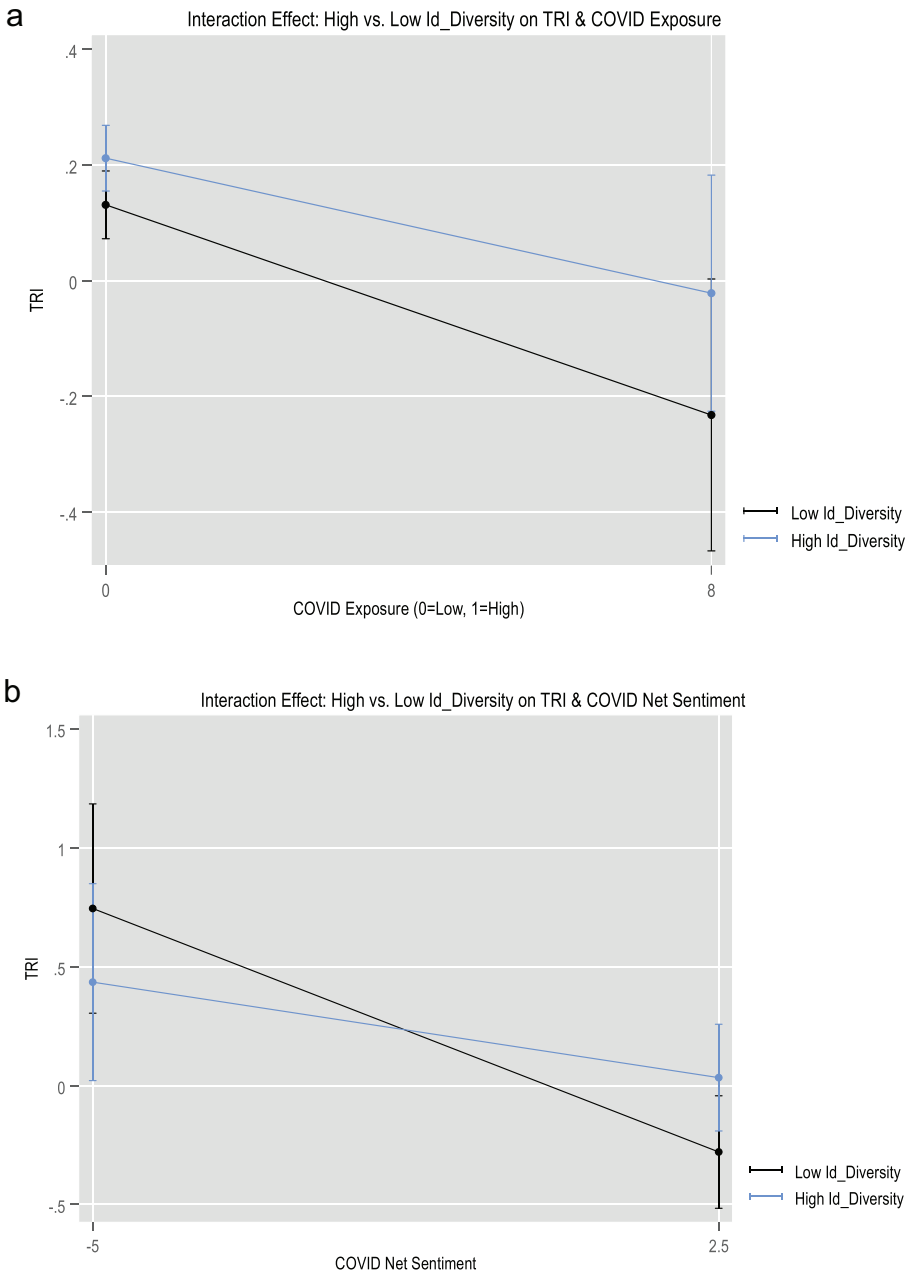

FIGURE 3 | (A) The interaction of Covid exposure and board ideological diversity on TRI. (B) The interaction of Covid net sentiment and board ideological diversity on TRI. [Color figure can be viewed at wileyonlinelibrary.com]

ID diversity in a previous period correlates with improved stock returns in subsequent periods. Since the independent variable is lagged, the temporal separation between ID diversity and stock performance reduces simultaneity bias, allowing for a stronger causal interpretation.

The positive coefficient implies that firms with more diverse independent directors (ID diversity) tend to perform better in the stock market over time. A possible explanation is that diverse boards enhance decision-making quality, mitigate groupthink and improve risk assessment, which in turn drives better firm performance and investor confidence. This aligns with extant literature (Delis et al. 2016) emphasising the benefits of diversity on corporate performance.

4.3.5 | Corporate Lobbying as a Possible Channel

This section investigates the role of ideological diversity (ID DIVERSITY) as a determinant of stock price resilience, positing corporate lobbying as a pivotal mechanism. Political ideology informs the scope and direction of lobbying efforts, which in turn shape firm-level financial outcomes by influencing revenue, cost structures and risk exposure. Extant research demonstrates that lobbying secures tax advantages (Richter et al. 2009), modulates visa and trade policies (Kerr et al. 2011), and mitigates regulatory oversight, such as fraud detection (Yu and Yu 2012). These interventions are associated with enhanced market and accounting performance (Chen et al. 2015), increased shareholder value (Hill et al. 2013), greater accounting conservatism (Kong et al. 2013),

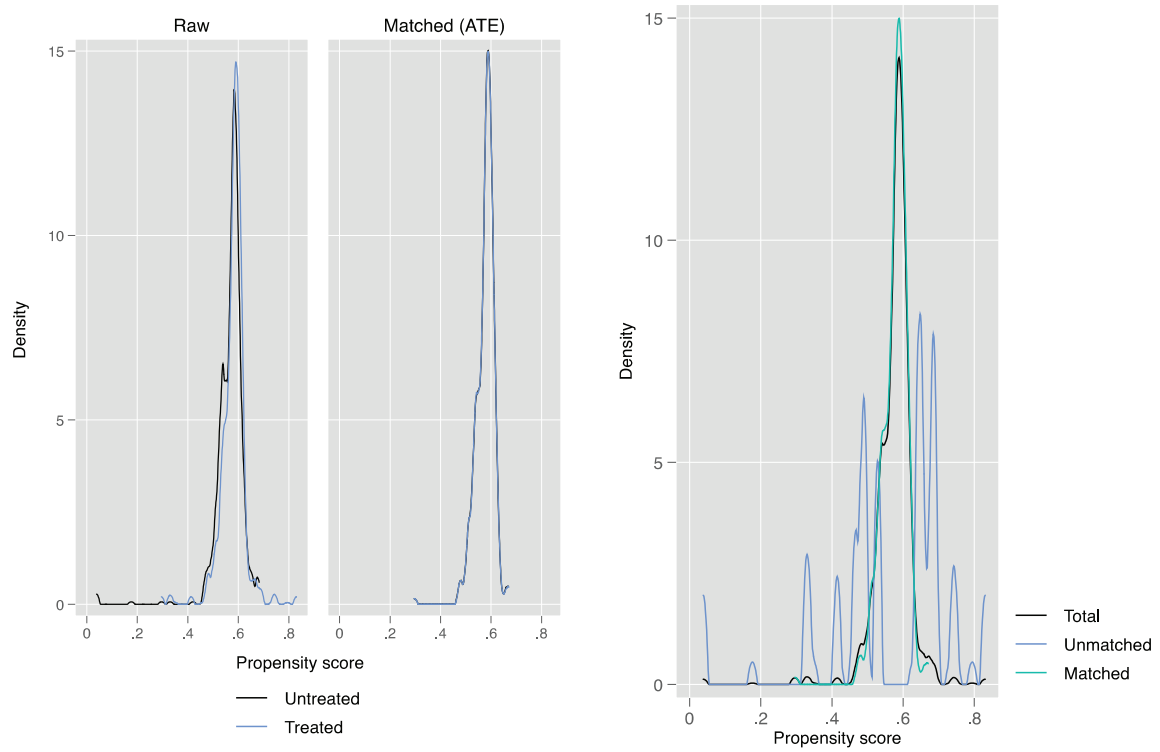

FIGURE 4 | Raw and matched average treatment effect (ATE). It shows the matched sample (Matched ATE) shows minimal variation in the ID_DIVERSITY modified variable, signifying effective matching. Post-matching, strong common support is evident, indicating similarity between groups regarding average characteristics. This ensures that individuals with the same X-values have a chance of being in both treatment and non-treatment categories. The second graph reveals a negligible disparity between the total and matched samples, suggesting a substantial similarity between the final matched sample and the original dataset. [Color figure can be viewed at wileyonlinelibrary.com]

TABLE 8 | Balance test of covariates.

		Raw	Matched
	Number of obs =	1682	3364
	Treated obs =	968	1682
	Control obs =	714	1682
	Standardised differences		**Variance ratio**
	Raw	**Matched**	**Raw**	**Matched**
CASH_HOLDING	−0.0515842	−0.0182204	0.9000323	0.9038628
PROFITABILITY	−0.0472457	0.0445843	0.9494331	1.037165
FIRM_SIZE	−0.0974675	0.0252989	0.8303244	0.9099691
J	0.078966	0.0307917	1.052897	1.0203

Note: The table presents the matched sample results, indicating that matching on the estimated propensity score balanced the covariates. The standardised differences are near zero, and the variance ratios are close to 1. First-step covariates used in the analysis are CASH_HOLDING, PROFITABILITY, FIRM_SIZE, CASH_HOLDING × PROFITABILITY(J).

TABLE 9 | Treatment-effects estimation ID_DIVERSITY.

		AI robust				
TRI	**Coef.**	**Std. Err.**	***z***	**P>|*z*|**	**[95% Conf. Interval]**	
ATETreat(1 vs. 0)	0.0570051	0.0210196	2.71	0.007	0.0158074	0.0982028

Note: The table presents the matched sample results; the outcome variable here is (TRI). The Total return index is the cumulative weekly return of firm *i* in quarter *t*. ATE is defined as the average treatment effect. First-step covariates used in the analysis are CASH_HOLDING, PROFITABILITY, FIRM_SIZE, CASH_HOLDING × PROFITABILITY(J).

TABLE 10 | Entropy balance sample.

Panel A						
	Treat			**Control**		
	Mean	**Variance**	**Skewness**	**Mean**	**Variance**	**Skewness**
CASH_HOLDING	0.1268	0.01989	1.765	0.1277	0.02023	1.811
PROFITABILITY	0.1264	0.007794	0.2709	0.1261	0.007789	−1.641
FIRM_SIZE	16.8	1.326	0.4226	16.8	1.489	0.149
J	0.01949	0.0009565	2.513	0.01943	0.0007544	1.725

Panel B		**Linearised**				
TRI	**Coef.**	**Std. Err.**	***t***	**P>|z|**	**[95% Conf. Interval]**	
Treat	0.064695	0.0292265	2.21	0.027	0.0073709	0.1220191
Constant	0.0820535	0.0193494	4.24	0.000	0.044102	0.120005

Note: Panel A presents the entropy balancing estimations. Panel B presents the matched sample OLS results; the outcome variable here is (TRI). The total return index is the cumulative weekly return of firm i in quarter *t*.

TABLE 11 | Lagged explanatory variables.

Dependent variable	**S&P 500 Stock Market Return Q1—Q4 2020 and Q1 2021**
ID_DIVERSITY (lagged)	0.156*
	(0.0923)
COVID_NET_SENTIMENT (lagged)	−0.120***
	(0.0319)
COVID_EXPOSURE (lagged)	−0.0495***
	(0.0112)
Constant	−1.459***
	(0.389)
Observations	1176
R-squared	0.089
Firm-level controls	Included
FF48 and quarter-year effects	Yes

Note: The table presents the regression of lagged explanatory variables. COVID_EXPOSURE is the number of times COVID-19 and its synonyms are used in the earnings conference call between the board and investors, scaled by the number of sentences in the transcript. COVID_NET_SENTIMENT is defined as the difference in the number of negative or positive tone words (associated with COVID-19 and its believed effect on the firm's future cash flows and investment risk) used in the earnings conference call between the board and investors. All the firm-level controls are included in Table 3. FF48 refers Fama-French 48 industry classification, using SIC codes. Quarter-year fixed effects capturing the calendar quarter (e.g., 2020Q1, 2020Q2, etc.). Heteroskedasticity robust standard errors are shown in parentheses. ***, **, *, representing 0.1%, 5%, and 1% significance levels, respectively.

and elevated firm value in highly regulated sectors (Agrawal and Knoeber 2001).

We argue that ideological diversity amplifies these effects by fostering more nuanced and adaptive lobbying strategies. A heterogeneous ideological composition, spanning corporate leadership, boards or stakeholder groups, equips firms to anticipate and respond to shifting policy landscapes, thereby reinforcing stock price resilience amid economic or regulatory turbulence. Unsal et al. (2016) further suggest that lobbying expenditures facilitate political learning, a process potentially enriched by diverse ideological perspectives, which enhances firms' capacity to maintain stock price stability under uncertainty.

To test this empirically, we draw on the literature to specify the following regression model:

$$Lobby\_EXP_{it} = \lambda_o + \lambda_1(\text{ID\_DIVERSITY})_{it} + \lambda_4 X_{it} + \sum_j \theta_j Industry_j + \sum_t \phi_t Quarter_t + \epsilon_{it} \quad (4)$$

Results, reported in Table 12, reveal a statistically significant positive relationship between ID DIVERSITY and lobbying expenditure,[10] suggesting that greater ideological heterogeneity indeed drives more robust political engagement. These findings underscore lobbying as a conduit through which ideological diversity bolsters stock price resilience.

TABLE 12 | Corporate lobbying as a possible channel.

Dependent variable	Lobbying_exp
ID_DIVERSITY	2.115***
	(0.295)
Constant	8.841***
	(2.123)
Observations	481
R-squared	0.533
Firm-level controls	Included
FF48 and quarter-year effects	Yes

Note: The table presents the regression dependent variable which is lobby expenditure. All the firm-level controls are included as in Table 3. FF48 refers Fama-French 48 industry classification, using SIC codes. Quarter-year fixed effects capturing the calendar quarter (e.g., 2020Q1, 2020Q2, etc.). Heteroskedasticity robust standard errors are shown in parentheses. ***, **, *, representing 0.1%, 5%, and 1% significance levels, respectively.

4.3.6 | Additional Test: Influence of Policy Decision

To understand how political contributions have influenced key policy decisions during the exogenous shock of Covid-19, we employ an event study. Following Gill (2024), we test how the US border closure and stay-at-home orders influence the relationship between ID_DIVERSITY and stock return. We define EVENT_BORDER as a dummy variable equal to 1 if the observations fall within the period when the US land border closure policy was in effect (2020Q1 to 2021Q1), and 0 otherwise.[11] Interaction is an interaction term defined as the product of ID_DIVERSITY and EVENT_BORDER. The event window for the US border closure is defined as 2020Q1 (January 1–31 March 2020), encompassing the policy announcement on 13 March 2020. This quarter includes approximately 72 days before and 18 days after the event, with the border restrictions persisting throughout the entire study period (2020Q1–2021Q1, −72 days to +377 days relative to March 13). For stay-at-home orders, the event window is the quarter of policy onset based on each firm's headquarters state. For example, California's order on 19 March 2020, falls in 2020Q1 (−78 days before, +12 days after), while Texas's order on 2 April 2020, falls in 2020Q2 (−92 days before, +89 days after, spanning April 1–June 30). Given our quarterly panel data, we use the full quarter containing each event to capture its impact on firms' returns. We compute cumulative abnormal returns (CAR) using a simpler market-adjusted model,[12] following the seminal paper of Brown and Warner (1985), which assumes a uniform $\beta = 1$ across firms. The abnormal returns (AR) are calculated as the difference between each firm's observed quarterly return (Tri) and the market return (R_m), approximated by the S&P 500 quarterly return for the corresponding period (e.g., −20% for 2020Q1, +20% for 2020Q2). Specifically, for each firm i in quarter t, we define: $AR_{it} = Tri_{it} - R_{mt}$. Given the structure of our panel dataset, which spans five quarters (2020Q1–2021Q1) for 378 S&P 500 firms, we then computed CAR as the AR for the event quarter itself, effectively a single-period measure (i.e., $CAR_{it} = AR_{it}$). This approach simplifies the aggregation process, as our quarterly data resolution does not permit finer granularity within quarters, such as daily or monthly returns typically used in multi-day *CAR* windows. For instance, in 2020Q1, a firm like Agilent Technologies with Tri of −0.238751 against an R_m of −0.20 yields an AR and CAR of −0.038751 for that quarter.

The findings in Column 1 of Table 13 shows that the relationship between ID_diversity and abnormal returns was positive but not statistically significant in the immediate aftermath of the US border closure and stay-at-home orders (Q1 2020). However, when we examine the CAR_Total across five quarters, the effect of ID_diversity on CAR_Total becomes significant ($p < 0.01$) as shown in Column 2 of Table 13. This suggests that while ideological diversity may not insulate firms from initial market-wide shocks, it potentially contributes to stronger long-term recovery or investor confidence. In addition, Column 3 of Table 13 indicates that diverse boards improve CAR generally ($\gamma 1 > 0$); however, as seen in the interaction term, the benefit of board diversity weakens during stay-at-home ($\gamma 3 < 0$). Furthermore, we conduct a *t*-test to compare abnormal returns (AR) between high and low ID_diversity firms during the stay-at-home event. The results show a significant difference ($t(754) = 2.45$, $p = 0.015$), indicating higher AR for diverse boards. In sum, the results highlight a potential resilience advantage for politically diverse firms in times of uncertainty, though the short-term signals are overshadowed by broader market dynamics.

5 | Conclusion

The global impact of the Covid-19 pandemic caused both loss of life and economic disruptions. This study examines the importance of firm board diversity in determining the firm resilience that in turn affect the stock return. Using a sample of S&P 500 firms, we find that board ideology significantly influences the firm performance (Kim et al. 2013), alleviating the pandemic's adverse effect. The above relationship is prominent when a firm has diverse ideologies. Thus, the findings of this research will extend the existing academic literature on board ideology and firm performance (e.g., Kim et al. 2013). By incorporating the importance of diverse political ideologies during times of uncertainty, the findings will assist investors in making informed decisions. The results suggest that board ideology is crucial in shaping disaster response strategies. These insights can assist boards in establishing diversity guidelines, assessing board structures and strengthening diversity strategies.

Additionally, higher board heterogeneity corresponds to improved firm performance (Kim et al. 2013). Hence, addressing diversity gaps becomes crucial for optimising board potential. Lastly, this research offers policymakers insights, highlighting political ideology's role in financial markets when devising crisis intervention strategies, especially in situations similar to the Covid-19 pandemic.

As with any empirical research, this study is not without limitations, which, while constraining its scope, simultaneously pave the way for meaningful future investigations. One notable limitation lies in our partial understanding (due to data limitations) of the ideologies of directors who contribute to third parties. We did not fully account for the broader ideological spectrum that these individuals may represent. Hudson and Morgan (2022) argue that a more granular classification of party affiliation beyond binary or traditional categorisations could uncover critical insights into

TABLE 13 | Event study on policy (border closure).

	Dependent variables		
	CAR_Q1	**CAR_Total**	**CAR_Total**
	(1)	**(2)**	**(3)**
ID_DIVERSITY	0.200	0.860***	0.875***
	(0.175)	(0.278)	(0.303)
EVENT_BORDER			0.0232
			(0.202)
ID_DIVERSITY*EVENT_BORDER			−0.0767
			(0.628)
Constant	−0.0673	−0.768	−0.775
	(1.046)	(1.763)	(1.765)
Observations	292	1457	1457
R-squared	0.416	0.420	0.420
Firm-level Controls	Included	Included	Included
FF48 and quarter-year effects	Yes	Yes	Yes

Note: The table presents the variables used in the estimation: ID_DIVERSITY is the measure of board diversity captures the probability that any randomly selected director has different ideologies. EVENT_BORDER is a dummy variable equal to 1 if the observation falls within the period when the US land border closure policy was in effect (2020Q1 to 2021Q1), and 0 otherwise. Interaction is an interaction term defined as the product of ID_DIVERSITY and EVENT_BORDER. Firm-level control variables used in the analysis are average age, board size, cash holding, firm Size, leverage, percentage of women, and profitability. FF48 refers Fama-French 48 industry classification, using SIC codes. Quarter-year fixed effects capturing the calendar quarter (e.g., 2020Q1, 2020Q2, etc.). Heteroskedasticity robust standard errors are shown in parentheses. ***, **, *, representing 1%, 5%, and 10% significance levels, respectively.

how individual attributes and ideological leanings influence corporate behaviour and decision-making processes. Expanding this classification to include ideological intensity, policy-specific preferences, or historical voting behaviours could refine our understanding of these dynamics. Additionally, incorporating qualitative methodologies such as elite interviews or discourse analysis could provide deeper insights into the motivations behind directors' ideological commitments. This gap in our study, while a limitation, presents an exciting opportunity for future research to explore these nuances in greater detail, potentially employing mixed-method approaches such as integrating text-mining techniques with survey-based ideological self-assessments to triangulate ideological influences with observable governance outcomes. Such investigations could refine our understanding of the interplay between personal beliefs and organisational strategy, offering a more comprehensive framework for analysing director impact.

Beyond this, the generalisability of our findings warrants careful consideration, as the study's scope is inherently bounded by its geographic and economic context. Conducted primarily within Western developed economies or a particular region, our analysis may not fully reflect the complexities of corporate governance in divergent settings. For instance, the political, cultural and institutional environments in which our sample operates could differ markedly from those in other regions, potentially limiting the universality of our conclusions. Prior research on governance dynamics in non-Western contexts (e.g., Aguilera and Jackson 2003) suggests that directors in emerging economies may be more intertwined with state influence, familial business networks or religious affiliations—factors that were not explicitly modeled in our study. To address this, future research could extend the current framework to encompass a wider array of sociopolitical discourses, particularly in economies where corporate governance is shaped by state capitalism, regulatory intervention or informal business networks. Examining governance dynamics in regions such as Southeast Asia, Latin America or Sub-Saharan Africa, where economic priorities, regulatory structures and societal norms vary widely could provide a more robust test of our findings. This expansion would not only assess the consistency of the observed effects across diverse international corporate governance mechanisms but also reveal whether contextual factors, such as state intervention, market maturity or cultural attitudes towards corporate responsibility, moderate the relationships we identified.

Moreover, extending the study to these diverse geographic and economic contexts could yield both theoretical and practical dividends. Theoretically, it would allow for a deeper interrogation of the boundary conditions under which our proposed mechanisms operate, potentially leading to a more universal model of governance behaviour. Practically, it could inform policymakers and corporate leaders in varied settings about the applicability of our insights, tailoring governance strategies to local realities. For example, examining how ideological influences manifest in jurisdictions with weaker institutional frameworks, higher levels of political instability or dominant state-owned enterprises might uncover unique resilience factors or vulnerabilities not evident in our current dataset. Additionally, longitudinal studies tracking these effects over time particularly in periods of regulatory shifts, economic crises or political transitions could further elucidate whether the impacts we observed are stable or evolve in response to global economic forces, such as technological advancement, shifting trade policies or geopolitical realignments.

From a practical standpoint, these findings carry significant implications for corporate governance policies, particularly in fostering ideological diversity on boards. Firms could implement mechanisms such as targeted recruitment strategies that prioritise candidates with diverse political and ideological backgrounds, ensuring a broader representation of perspectives in decision-making processes. Structured board evaluation processes, incorporating self-reported ideological assessments, AI-driven sentiment analysis or third-party evaluations of directors' public affiliations, could help identify and mitigate echo-chamber effects. Additionally, firms might establish training programs to enhance directors' awareness of how their ideological leanings influence strategic choices, promoting a culture of constructive debate and balanced decision-making. Such initiatives could strengthen governance resilience by balancing competing viewpoints, particularly in firms operating across multiple jurisdictions with varying socio-political expectations. These practical steps not only address the limitations of our study's scope but also provide actionable pathways for organisations to leverage ideological diversity as a governance asset.

However, alternative explanations and confounding factors should still be considered to fully contextualise our findings. While robustness tests of endogeneity in this study confirmed its absence, other unexamined variables, such as, directors' personal networks, industry-specific norms or macroeconomic conditions could potentially confound the relationship between ideology and governance outcomes. Prior research (Hudson and Morgan 2022) suggests that board interlocks, professional affiliations and sectoral dynamics (e.g., heavily regulated industries vs. market-driven sectors) might independently shape directors' decision-making, potentially masking or amplifying the ideological effects we observed. Another limitation of our study is related to the event study. Our sample is from S&P 500 firms headquartered in the United States, but they are also listed on stock markets in other countries outside of United States. So, varying legal frameworks across different nations can engender disparities in corporate board practices. In addition, Covid-19, a global pandemic, had varying impacts on different countries, affecting governments, healthcare systems and other institutions in distinct ways. Moreover, the impact of Covid-19 varies across the sectors and it is difficult to isolate the impact of this pandemic from concurrent policies and situations such as economic packages, bank's flexibility of interest payment, and individual's behaviour. Furthermore, the unprecedented volatility of cryptocurrencies and other commodity assets further complicates the impact of Covid-19 on stock returns in our study. Thus, our observed relationships and generalizability to the firms around the world can be addressed in future research. Future studies can also control for these confounders by integrating network analysis (e.g., social graph modeling), industry-level governance benchmarking, or time-series economic indicators, employing advanced statistical techniques such Bayesian hierarchical modeling (Veenman et al. 2024; Seltzer et al. 1996) to better isolate these influences. Addressing these factors would further enhance the robustness of our conclusions and provide greater clarity on the mechanisms driving our results.

Conflicts of Interest

The authors report there are no competing interests to declare.

Data Availability Statement

Data sharing is not applicable to this article as no new data was created or analysed in this study.

Endnotes

[1] In this paper, we use stock returns as a proxy for firm performance, the term firm and corporate are used interchangeably in the paper.

[2] The ability of firms to promptly react to and swiftly rebound from disruptive occurrences or crises encountered (Arikan 2022).

[3] The data is published by the New York Times at https://github.com/nytimes/covid-19-data.

[4] Ideology is a system of beliefs and values that are internally consistent and comprehensive and shape an individual's behaviour and thinking (Jost 2006). These beliefs and values are often grounded in an individual's social, cultural, and political experiences and can profoundly impact their worldview. The nature of an individual's ideology can be discerned through various indicators, including their political orientations, which have been the subject of extensive research. Scholars such as Bonica (2016) and Jost (2006) have highlighted the importance of ideology as a guiding force in individuals' lives. It can serve as a framework for understanding complex issues and deciding how to act in various situations.

[5] COVID_EXPOSURE, as developed by Hassan et al. (2020), is a firm-level metric derived from quarterly earnings call transcripts sourced from the Refinitiv Eikon database. Covering 326,247 English-language records from 11,943 firms across 84 countries (incl. the United States), it is calculated by counting occurrences of terms like 'sarscov', 'coronavirus', 'corona virus', 'ncov' and 'covid' in each transcript, then scaling this by the total word count to normalise for length. This quantifies the prominence of COVID-19 in corporate discussions. Further details are available in Hassan et al. (2020).

[6] COVID_NET_SENTIMENTS, as formulated by Hassan et al. (2020), measures the net sentiment (negative minus positive) of epidemic disease discussions in quarterly earnings call transcripts Building on disease mentions (e.g.,'sarscov', 'coronavirus', 'covid'), it uses a 10-word proximity window to detect synonyms for 'risk' or 'uncertainty', as refined in Hassan et al. (2020). This yields a sentiment differential, detailed further in Hassan et al. (2020).

[7] Control variables are explained in detail in Appendix 1.

[8] Effect size quantifies the strength of a predictor's influence on stock performance, helping to determine whether a statistically significant result is also meaningful in real-world decision-making. Cohen's is calculated using the formula:$f^2 = R^2 / (1–R^2)$ where represents the proportion of variance explained by the independent variables in the regression model. A larger value indicates a stronger effect size. Cohen (1992) provides guidelines for interpreting, $f^2 \geq 0.02$, $f^2 \geq 0.15$, and $f^2 \geq 0.35$ represent small, medium, and large effect sizes, respectively.

[9] Applied Hosmer-Lemeshow's goodness-of-fit approach to improve the propensity score model due to possible non-linearity in the relationships between the cofounders and the log odds of being treated.

[10] We collect lobbying expenditure data from http://www.opensecrets.org/lobby/.

[11] We also examine the impact of 'stay at home' policy by including Event_stay_home defined is a dummy variable equal to 1 for observations in 2020Q1, when widespread state-level stay-at-home mandates were implemented across the United States, and 0 otherwise. The variable is not included in the table due to multicollinearity, but in a separate regression we find qualitatively similar results (not reported).

[12] We did not use a market model (e.g., $R_{it} = \alpha_i + \beta_i R_m + \epsilon_{it}$) to estimate normal returns due to limitations imposed by the structure of our panel data. The market model requires a robust estimation window—typically 100–250 daily observations prior to the event—to reliably calculate firm-specific α and β coefficients. However, our dataset, consisting of only five quarterly observations per firm (2020Q1–2021Q1), lacks the temporal depth for such estimation. With just four post-event quarters available (and none pre-dating the border closure in March 2020), any attempt to estimate β would be statistically underpowered, rendering the market model impractical.

[13] Hosmer-Lemeshow's goodness-of-fit.

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Appendix 1

Variable definitions

Variable	Definition	Source
AVE_AGE	The average age of inside directors.	FEC.gov
BOARD SIZE	Total number of directors in a given board.	FEC.gov
CASH_HOLDING	Cash and short-term investments/total assets.	Refinitv/Worldscope
COVID_EXPOSURE	The number of times COVID-19 and its synonyms are used in the earnings conference call between the board and investors, scaled by the number of sentences in the transcript.	Hassan et al. (2020). The data is available at https://www.policyuncertainty.com/firm_pr.html
COVID_NET_SENTIMENTS	The difference in the number of negative or positive tone words (associated with COVID-19 and its believed effect on the firm's future cash flows and investment risk) used in the earnings conference call between the board and investors.	Hassan et al. (2020). The data is available at https://www.policyuncertainty.com/firm_pr.html
ESG	The overall firm score is calculated using disclosed data and the ESG pillar ratings.	Asset4
FIRM_SIZE	The natural logarithm of total assets.	Refinitv/Worldscope
ID_DIVERSITY	The measure of board diversity captures the probability that any randomly selected director has different ideologies.	Author's calculations following Hutton et al. (2011)
LEVERAGE	Debt in current liabilities plus long-term debt divided by total assets.	Refinitv/Worldscope
PCNT WOMEN	The percentage of the total number of women to the total number of board directors.	FEC.gov
PROFITABILITY	The ratio of net income (minus taxes) to total assets.	Refinitv/Worldscope
TRI	The total return index is the cumulative weekly return of firm I in quarter t.	Refinitv/Worldscope