THE MODERATING EFFECT OF COMPANY-SPECIFIC INVESTOR SENTIMENT ON STOCK PRICE REACTIONS TO EXOGENOUS SHOCKS

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Abstract: This study investigates the moderating role of market-based, company-specific investor sentiment (IS) on stock price reactions to exogenous shocks. Utilizing data from 367 S&P 500 companies, we construct a daily IS indicator based on principal component analysis of market variables. We assess abnormal returns and volatility surrounding three key pandemic-related announcements by applying event study methodology, GARCH modelling, and non-parametric tests. Our findings reveal significant differences in cumulative abnormal returns between high- and low-IS firms, particularly during the initial shock, suggesting that IS moderates stock return reactions. However, no corresponding moderating effect of IS on stock price volatility was found. These results imply that while IS influences return sensitivity to unexpected exogenous shocks, it does not buffer the impact of volatility. The study offers practical insights into the nuanced role of IS under crisis conditions and highlights the value of market-based sentiment measures.

***Keywords*:** investor sentiment, exogenous shock, behavioural finance, stock market volatility, S&P500

INTRODUCTION

Although the existing literature explored the influence of investor sentiment (IS) on asset pricing and market volatility, the nature of this relationship remains insufficiently understood. Empirical findings regarding the predictive power of IS for stock market returns are often inconclusive.

IS is not a directly observable factor (Gao et al., 2025; Ung et al., 2024) representing investors' beliefs “that cannot be rationally justified” (Morck et al., 1989) expressed in attitudes toward security, leading to behavioural biases (Seok et al., 2019).

Numerous studies revealed a positive relationship between IS and stock returns (Brown & Cliff, 2005; Du, 2021; Mangee, 2018; Ryu et al., 2017; Shen et al., 2022; Shu & Chang, 2015; Yang & Zhou, 2015). Significant relationships between IS and stock price volatility were also reported (Kumari & Mahakud, 2015; Lee & Roh, 2012; Sanford, 2022; Shen et al., 2022). Changes in IS toward a company or its products allow forecasting stock volatility jumps (Sanford, 2022).

However, several studies failed to demonstrate the predictive power of IS regarding stock returns, and the literature suggests potential explanations for this inconsistency, including the variety of frameworks and conditions. For example, Birru & Young (2022) found IS more predictive during high uncertainty. Wagner & Wei (2024) found that ambiguity weakens the IS–stock price relationship, while standard uncertainty strengthens it. Analysing the interaction of good (bad) news with investors' optimism (pessimism), Frydman et al. (2021) found that the IS–stock returns relationship is highly variable in timing and magnitude.

Another common explanation for the inconclusive evidence on the IS-market returns relationship lies in the methodological approaches, predominantly relying on ready-made text-based and survey-based indices. A growing number of scholars raise concerns that such indices may not adequately capture the irrational components of investor expectations (Pham et al., 2025; Ung et al., 2024) and are subject to limitations such as sample selection bias (Zhou, 2018). As a result, market-based indices are widely regarded as more objective measures of IS (Aggarwal, 2022; Pham et al., 2025).

While most studies focus on how IS directly affects stock prices, few explore its role as a moderator between exogenous shocks and market returns. Ryu et al. (2020), studying the impact of financial crises as exogenous shocks, found that they enhance the relationships between IS and returns irrespective of market conditions. Cepni et al. (2025) found that monetary policy shocks lead to stronger negative stock returns under high IS regimes. Truong et al. (2021) found the effect of IS on stock returns in the context of international football matches as exogenous shocks.

Building on existing research, we extend the less commonly studied approach of the mediating role of IS in the context of an exogenous shock. Our study aims to examine the moderating effect of a market-based company-specific IS on stock price reactions to exogenous shocks. We employ the IS measure proposed by Seok et al. (2019). To investigate the short-term effect of the shock, we calculated a daily-based sentiment indicator based on 367 companies from the S&P 500, and analysed its moderating effect on stock prices using event study methodology, GARCH model, Mann-Whitney, and median tests.

Our results show significant differences in cumulative abnormal returns (CARs) between companies with high and low IS during the first unexpected information about the shock. Over time, investors adopted more deliberate responses, potentially reducing differences between the abnormal returns as a reaction to the shock in companies of high and low IS. Regarding stock price volatility, the number of significant responses to shocks declined sharply as the pandemic progressed. However, no moderating effect of IS on volatility during the exogenous shock was found.

METHODOLOGY

To examine the moderating effect of a market-based company-specific IS on stock price reactions to exogenous shocks, we put forward the following research questions:
RQ1: Does the stock price reaction to an exogenous shock differ depending on the level of market-based company-specific IS?
RQ2: Does the impact of an exogenous shock on stock price volatility differ depending on the level of market-based company-specific IS?

Our study consists of three parts. First, using event study methodology, we CARs and changes in volatility in response to three critical shock-related announcements: the first confirmed COVID-19 case in the U.S. (January 21, 2020), the declaration of a national public health emergency (January 31, 2020), and the WHO's classification of COVID-19 as a global pandemic (March 11, 2020).

Second, we examined whether IS could have moderated the effect of an exogenous shock on stock prices. Thus, we built a market-based company-specific sentiment metric aggregated and weighted by market capitalization across S&P 500 companies. We chose a market-based IS indicator as previous literature revealed inconclusive evidence regarding the IS-market returns relationship, resulting from applying ready-made IS indicators: text-based and survey-based indices. The reason is that they may lack a direct and reliable connection to actual investment behaviour, as self-reported attitudes do not necessarily translate into real-world financial decisions (Pham et al., 2025; Ung et al., 2024; Zhou, 2018). Further limitations of these indicators result from sample selection, sample size, and frequency of conducting surveys in the financial markets (Zhou, 2018). These underscore the need to incorporate market-based indices widely regarded as more objective measures of IS (Aggarwal, 2022; Pham et al., 2025). Zhen et al. (2025), integrating historical stock market data, social media, internet, and newspaper news, constructed 5 IS indicators. They found that indicators based on principal component analysis exhibited the strongest predictive power for stock price movements. Thus, we used a market-based IS indicator proposed by Seok et al. (2019) composed of four principal components based on variables: Relative Strength Index, Psychological Line Index, Logarithm of daily Trading Volume, and Adjusted Turnover Rate.

To investigate whether IS has moderated the impact of the exogenous shock on CARs, we employed non-parametric tests (Mann-Whitney and median tests). We utilized different versions of the CARs in a 3, 5, and 7-day windows symmetrically around, after, and before an event date, respectively.

Third, we investigated the influence of exogenous shocks on price volatility. To achieve this, we employed a GARCH(1,1) model incorporating a dummy capturing the shock's effect on both the level and variance. Finally, we assessed whether elevated IS amplifies the shock's influence on price volatility.

Data Selection

Since part of our study refers to the event study methodology, we excluded from the primary S&P500 constituents' sample all the companies that faced the confounding events, based on confounding events listed, i.a., by McWilliams & Siegel (2000). First, we omitted the companies obliged to publish notifications under the Securities Exchange Act of 1934 in the event windows. Next, we analysed additional news referring to the companies left in the sample, sourced from Google News. Ultimately, the final sample consists of 367 companies listed in the S&P 500 index.

FINDINGS

To assess how company-specific IS influences stock price reactions to exogenous shocks, we classified companies into high and low IS groups based on the IS indicator values within the estimation window. Previous research showed that the IS declined around the exogenous shocks analyzed in the study (Blajer-Gołębiewska et al., 2024).

For the January 21, 2020, event, the mean-based classification identified 191 companies with high and 176 with low sentiment. Using the median approach, there were 182 high and 185 low. On Jan. 31, 2020, the mean method classified 171 as high and 196 as low, while the median method resulted in 184 as high and 183 as low. On March 11, 2020, the mean method identified 176 high and 191 low, and the median identified 186 high and 181 low.

In Table 1, we reported the results of the Mann-Whitney and median tests referring to the differences between CARs calculated for the exogenous shocks for companies with high and low IS. We found that stock return reactions differed significantly between high- and low-sentiment companies in response to the first unexpected exogenous shock. This pattern holds across the around-the-event, pre-event, and post-event windows (Panels P1A, P1B, and P1C). For the second and third event dates, the differences between sentiment groups are less pronounced, likely due to increased investor awareness of the threat. Specifically, for the second event, significant differences between high- and low-sentiment firms were observed in the pre-event and around-the-event windows, but not in the post-event period, suggesting that the event may have been anticipated. For the third event, significant differences were found in the pre- and post-event periods. However, they were not significant in the short-term (3 days) around-the-event reaction. This may indicate that, following the prior two announcements, investors were more prepared and their responses were more reasoned and well-considered. Our results are robust across statistical tests and classification methods.

After analysing the significant and insignificant impacts of external shocks on stock prices using the GARCH(1,1) model, we found that for the first event, there were 71.5% significant and 28.5% insignificant dummies. For the second event, the ratios changed to 51.4% vs. 48.6%, and for the third event, only 35.8% vs. 64.2%. This indicates that the effect of external shocks related to COVID-19 diminished over time as more information about the pandemic became available.

In Table 2, we summarised the findings from the chi-square test of independence, which assessed the variation in the impact of external shocks on stock prices for companies with high IS compared to those with low sentiment. Despite the observed differences in CARs, chi-square tests on the significance of stock price responses revealed no statistically significant distinction between high- and low-sentiment companies.

Table 1. Differences in CARs resulting from an exogenous shock for companies with low and high IS

Date (event window in days)	Event Window	P[a]	Mann-Whitney Test		Median Test	
			Cross-Sectional Mean	Cross-Sectional Median	Cross-Sectional Mean	Cross-Sectional Median
21.01.2020 (3)	17.01-22.01	P1A	-7.686 ***	-7.490 ***	51.171 ***	46.691 ***
21.01.2020 (5)	16.01-23.01		-7.676 ***	-7.428 ***	42.539 ***	38.469 ***
21.01.2020 (7)	15.01-24.01		-9.081 ***	-9.187 ***	60.600 ***	65.522 ***
31.01.2020 (3)	30.01-03.02	P2A	-5.845 ***	-5.767 ***	32.444 ***	28.744 ***
31.01.2020 (5)	29.01-04.02		-5.497 ***	-5.761 ***	30.085 ***	28.744 ***
31.01.2020 (7)	28.01-05.02		-3.012 ***	-3.848 ***	4.451 **	34.302 ***
11.03.2020 (3)	10.03-12.03	P3A	-1.584	-1.558	0.011	0.011
11.03.2020 (5)	09.03-13.03		-5.880 ***	-6.121 ***	28.828 ***	31.039 ***
11.03.2020 (7)	06.03-16.03		-5.244 ***	-5.420 ***	16.858 ***	18.575 ***
21.01.2020 (3)	21.01-23.01	P1B	-6.372 ***	-6.046 ***	29.923 ***	26.534 ***
21.01.2020 (5)	21.01-27.01		-7.753 ***	-7.929 ***	51.151 ***	58.891 ***
31.01.2020 (3)	31.01-04.02	P2B	-0.794	-1.064	0.712	0.895
31.01.2020 (5)	31.01-06.02		0.810	0.508	1.602	0.895
11.03.2020 (3)	11.03-13.03	P3B	-2.245 **	-2.395 **	4.001 **	4.873 **
11.03.2020 (5)	11.03-17.03		-5.485 ***	-5.410 ***	18.632 ***	18.575 ***
21.01.2020 (3)	16.01-21.01	P1C	-9.604 ***	-9.398 ***	67.327 ***	65.522 ***
21.01.2020 (5)	14.01-21.01		-10.498 ***	-10.667 ***	97.781 ***	103.980 ***
31.01.2020 (3)	29.01-31.01	P2C	-7.818 ***	-7.718 ***	57.677 ***	55.709 ***
31.01.2020 (5)	27.01-31.01		-9.641 ***	-9.963 ***	60.927 ***	68.970 ***
11.03.2020 (3)	09.03-11.03	P3C	-7.126 ***	-7.126 ***	31.134 ***	35.901 ***
11.03.2020 (5)	05.03-11.03		-8.169 ***	-8.642 ***	49.754 ***	54.104 ***

Notes: [a] – data is divided into three panels (P). Panel P1 refers to the event day of 21.01.2020, panel P2 to the event day of 31.01.2020, and panel 3 to 11.03.2020. Panels A - refer to symmetrical event windows around an event date. Panels B refer to event windows after an event date, and panels C refer to event windows before an event date.
Source: own calculations.

Table 2. Differences in exogenous shock impact significance for companies with low and high IS

	P1C		P1D		P2C		P2D		P3C		P3D	
	High	Low	High	Low	High	Low	High	Low	High	Low	High	Low
Sig	139	117	120	136	102	82	86	98	74	54	67	61
Insig	60	42	52	50	97	77	86	88	125	105	105	125
Stat	0.61		0.49		0.00		0.26		0.40		1.48	
p	0.44		0.48		0.95		0.61		0.53		0.22	

Notes: P1 (P2, P3) – refers to event date, specifically 21.01.2020 (31.01.2020, 11.03.2020), C(D) – high IS defined as higher than the cross-sectional mean (median)
Source: own calculations.

CONCLUSIONS

This study demonstrates that IS, when measured using market-based, company-specific indices derived through principal component analysis, significantly influences how companies respond to exogenous shocks regarding stock price reactions (RQ1). Notably, the results indicate that companies with high IS

tend to experience significantly different CARs than those with low IS, particularly during the initial phase of the shock. These differences are evident across pre-event, event, and post-event windows, suggesting that sentiment moderates investor reactions during unexpected exogenous shocks. Furthermore, we found the effect of the exogenous shock on price volatility significant. However, no differences between companies with high and low IS were discovered (RQ2).

As the adverse condition unfolded and investors became more informed about the nature of the threat, the differences in CARs between high- and low-sentiment groups became more ambiguous. This trend implies that over time, market participants adopted more deliberate responses, potentially reducing the moderating effect of sentiment. The GARCH(1,1) model results further support this interpretation, showing a decline in the number of significant volatility responses to shocks as the pandemic progressed.

However, the findings also come with several limitations. While we observed significant differences in CARs between high- and low-sentiment companies, chi-square tests on the significance of stock price reactions revealed no statistically significant distinction between these groups. This suggests that IS may have limited predictive power when used as a sole indicator of sensitivity to exogenous shocks, especially when examining binary outcomes of impact significance. Additionally, although our use of a market-based sentiment indicator addresses many of the shortcomings associated with survey-based measures, it may still capture noise from trading behavior unrelated to sentiment itself. Further, the study is constrained by its focus on a single type of exogenous shock—pandemic-related events—within a limited timeframe. While grounded in objective market data, our sentiment measure remains a proxy and may not fully reflect the psychological dimensions of investor behavior. Finally, unobserved sectoral heterogeneity and company-specific characteristics may also influence stock price responses and should be accounted for in future research.

In summary, this research contributes to the ongoing discourse on IS by offering a novel perspective on its mediating effects during an exogenous shock. These findings suggest that company-specific IS can partially moderate stock price reactions to sudden negative events, particularly regarding return magnitude. However, sentiment appears to be less effective in moderating volatility, which may be more influenced by broader systemic factors or uncertainty unrelated to sentiment. Practically, our findings are valuable for investors, portfolio managers, and market analysts, as they highlight that IS does not provide a protective effect against external shocks.

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