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# Consumer confidence as a mediator between dividend announcements and stock returns

Fakhrul Hasan<sup>1</sup> · Basil Al-Najjar<sup>2</sup>

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## Abstract

In this study, we examine the potential influence of consumer confidence on the association between announcing dividend payments and stock returns. We used FTSE 350 spanning the period from 1990 to 2021, using the UK consumer confidence index as a proxy for investor sentiment. The primary empirical test focused on cumulative abnormal returns  $[-1, +1]$ , supplemented by a robustness test spanning  $[-10, +10]$ . Additionally, a generalized method of moments (GMM) estimation was conducted using CAR  $[-1, +1]$ . Our analysis revealed: under positive consumer confidence, firms announcing dividend increases experienced a positive market response, while under negative consumer confidence, firms announcing dividend decreases elicited a negative market reaction. This study contributes valuable insights to the discourse on investor sentiment and its impact on stock market dynamics.

**Keywords** Consumer confidence index · Dividend · Signalling theory · Stock return

**JEL Classification** G10 · G12 · G14

## 1 Introduction

Traders investing in the financial markets are either uninformed or knowledgeable. Uniform traders are either traditional or sentimental dealers (Shleifer and Vishny 1990). The topic of what determines stock prices effectively turns into an empirical one if it is acknowledged that there is no connection between prices and underlying values. More precisely, are these influences balanced, and if so, in which direction (positive or negative) does the stock price move in response to changes in consumer confidence? Will it matter whether consumer confidence and dividends increase or decrease by a certain amount how much of an impact

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they have on the stock market? Our aim is to determine whether and to what extent the negative impact can provide an answer to this query.

We have employed the Consumer Confidence Index (CCI) as a reliable measure of consumer confidence. Qiu and Welch (2006) have empirically examined this index and found a significant correlation between it and another sentiment index, the UBS/Gallup Index of Investor Optimism. Furthermore, we aim to maintain consistency in our proxy for consumer confidence, given that we are analyzing different industries within the FTSE 350. The CCI serves as a robust proxy across the various sectors in our sample. Previous literature has employed a variety of proxies for investor sentiment, including major sporting events (Hasan and Al-Najjar 2024a, b; Edmans et al. 2007), temperature (Bolton and Kacperczyk 2021; Hasan 2024), air pollution (Lepori 2016), and calendar anomalies (Hasan and Al-Najjar 2024a, b; Steeley 2001). However, relatively few studies have used the CCI as a proxy for investor sentiment, and no research to date has examined the potential influence of consumer confidence on the relationship between dividend announcements and stock returns.

The Consumer Confidence Index (CCI) has emerged as a keystone in shaping consumer decision-making dynamics and, by extension, exerting influence over the economic landscape (Bock et al. 2014; Soric 2018). As evidenced by previous literature, CCI serves as a significant indicator of a nation's economic power from the vantage point of consumers, clarifying their sentiments and contributing to predictive models of economic health (Ferrer et al. 2016). The empirical application of CCI has primarily revolved around its utility as an invaluable tool for determining consumers' optimism about the broader economic milieu, offering insights into a country's economic trajectory (Morlino and Quaranta 2016; Soric 2018).

Notably, media outlets exhibit a key interest in consumer confidence-related developments, providing detailed coverage on aspects such as whether CCI has 'slipped,' 'turned up,' or 'held steady' (Ferrer et al. 2016). This heightened scrutiny is not unwarranted, considering that CCI is disseminated on a monthly basis in numerous countries, carefully monitored by governmental bodies, business stakeholders, and policymakers alike. Despite the historical predilection for leveraging CCI as significant tool for economic predictions (Lolic et al. 2022), recent scholarly research has observed a paradigm shift wherein CCI is increasingly used as a proxy for investor sentiment (Ferrer et al. 2016; Khang et al. 2021; Wang et al. 2021). This trajectory introduces a compelling inquiry into the relationship between CCI and market fundamentals, echoing the sentiment elucidated by Poterba (2000).

DeLong et al. (1990) highlight the irrational dimension of price-creation, encapsulated within investor sentiment. Given the well-documented relation between the stock market and economic conditions (Poterba 2000), the role of CCI in capturing consumers' expectations about future economic conditions is of significance. Yet, it is imperative to acknowledge the reciprocal nature of this relationship, wherein changes in stock market prices exert a palpable influence on consumers' perceptions and behaviours concerning economic conditions (Ferrer et al. 2016). Unveiling the intricate dynamics of these modifications, particularly their confined impact on CCI components associated with general economic conditions, represents a critical academic pursuit (Fisher and Statman 2003; Jansen and Nahuis 2003).

A fundamental knowledge of CCI fluctuations assumes increased significance, as shown by Blanchard (1993), given that consumer retrenchment during periods of diminished confidence can precipitate economic recessions. The identified linkage between robust consumer confidence and future real GDP growth, contrasted against

the potential ramifications of weakened consumer confidence leading to economic downturns, underscores the pivotal role played by CCI in shaping economic trajectories (Howrey 2001). Granger causality tests, conducted in previous studies, further corroborate the tangible influence of stock price changes on consumer confidence (Chen 2012).

In this study, we make a substantial contribution to the field of corporate finance by addressing a critical gap in the existing literature: the role of consumer confidence in mediating the relationship between dividend announcements and stock returns. While the market reaction to changes in dividend policy is well-documented, our research introduces a novel perspective by examining how secondary effects of investor sentiment, particularly consumer confidence, clarify these market reactions.

Dividends traditionally serve as both a reward for investors and a mechanism to enhance firm value, with the dividend signalling theory suggesting that such announcements convey implicit messages about future profitability. However, beyond this, we demonstrate that consumer confidence adds an additional layer of complexity to market responses, providing new insights into investor behaviour. Specifically, our findings indicate that during periods of low consumer confidence, the market reacts more negatively to announcements of dividend reductions, suggesting that investor sentiment exacerbates concerns about firms' financial health. Conversely, during periods of high consumer confidence, dividend increases are met with a more positive market reaction, reinforcing the belief in a firm's strength and future profitability. This sentiment-driven behaviour, as reflected through consumer confidence, extends the understanding of dividend policy's impact on market behaviour. Our study shows that investor sentiment (largely driven by broader economic and psychological factors) can influence how market participants interpret financial signals such as dividend announcements, and hence contributing to the literature beyond what is already known. In addition to its academic contributions, we offer practical implications for various stakeholders, including investors, financial managers, and policymakers. Understanding how consumer confidence influences market responses to dividend announcements can guide investment decisions and corporate strategies, linking academic research to real-world applications. Furthermore, our study provides clear insights into how market reactions vary under different levels of consumer sentiment, offering practitioners valuable information for navigating markets under diverse economic conditions.

Accordingly, this study bridges this gap by providing a comprehensive and novel examination of the interplay between dividend announcements, stock returns, and consumer confidence. Drawing on FTSE-350 index data spanning the period from 1990 to 2021, we employ robust analytical methodologies, including ordinary least squares (OLS) and Generalized Method of Moments (GMM) estimation, on a large panel dataset comprising 4021 firm-year observations. This methodological perspective not only enhances the credibility and reliability of our findings but also contributes to the methodological toolkit in the field. The period of analysis offers a comprehensive view of the dynamics between consumer confidence, dividend announcements, and stock returns across different economic cycles and market conditions. Moreover, our focus on the FTSE-350 index provides insights into the dynamics within a specific market context, allowing for potential comparisons with similar studies in other markets.

This research, organized as follows, contributes substantively to the existing body of knowledge. Section 2 articulates the theoretical framework and develops hypotheses, Sect. 3 delineates the data and methodology, Sect. 4 presents the results, discussions, and

robustness tests, and Sect. 5 provides a conclusive summary of our findings and avenues for future research.

## 2 Theoretical framework and hypothesis development

### 2.1 Stock return and consumer confidence

The Efficient Market Hypothesis (EMH) posits that the conventional “search for value” practiced by many financial professionals has encountered challenges due to the inherent lack of predictability in liquid asset returns. From previous research, it is evident that earlier scholars have identified two channels for the transmission of information from consumer confidence to stock returns (Ciner 2014). First, consumer confidence explores households’ expenditure and serves as a key leading economic indicator. Second, there is a likelihood that changes in consumer confidence will exert a psychological impact on the behaviour of market players. Prior literature has consistently highlighted a robust relationship between consumer confidence and movements in stock prices (see Lemmon and Portniaguina 2006; Ung et al. 2023). When researchers employed U.S. data, they commonly observed that changes in the consumer confidence index were negatively associated with stock returns. This pattern is particularly pronounced for smaller, less arbitrated firms (Lemmon and Portniaguina 2006), aligning with arguments advanced by Baker and Wurgler (2006, 2007). These findings hold more validity for small, challenging-to-arbitrage firms (Lemmon and Portniaguina 2006), aligning consistently with the arguments posited by Baker and Wurgler (2006, 2007). Consumer confidence index, according to research by Kumar and Lee (2006), can forecast stock returns both individually and collectively.

While Jansen and Nahuis (2003) reported that stock returns generally Granger-cause consumer confidence at very short horizons, employing data from 11 European countries, Otoo (1999) found that increases in stock prices boost future consumer confidence based on data from the Wilshire 5000 stock price index. Otoo (1999) identified two possible reasons why future increases in consumer confidence can be attributed to large stock returns. The first pathway is the traditional wealth impact, wherein individuals feel more optimistic because they are aware that their wealth has increased due to stock market support. The second channel is the leading indicator effect, wherein investors interpret changes in stock returns as a sign of future growth.

### 2.2 Stock return and dividend policy

Since Lintner’s seminal study in 1956, numerous alternative theories have been put forth to explain the mystery surrounding the dividend announcement. Gordon (1963) reported their points for the risk benefit of dividend payments above capital gains and put out the “bird-in-the-hand” theory in response to Miller and Modigliani’s (1961) dividend irrelevance hypothesis. Another well-known dividend theory is the agency hypothesis, which was motivated by Jensen’s dividend cash flow theory (1986). The foundation of this study is the “dividend-signaling hypothesis” or “information content of dividend theories.”

Dividend policy can be an essential instrument for informing shareholders and other market players of critical information when corporate managers are aware of the company’s present financial status and expected future cash flows (Bozos et al. 2011;

Hasan and Al-Najjar (2024a, b). This theory's rationale, according to Bhattacharyya (2007), is that dividend signalling is crucial in institutional contexts since payouts are subject to high taxes and the dividend's size is determined by how positive or negative the news is. The dividend-signalling idea is furthered by the claims made by John and Williams (1985) that dividend fluctuations may reflect management's perception of the company's potential earnings changes in the present or future.

Aharony and Swary (1980) found that when dividends rise, stocks see an average abnormal return of +0.36 percent, and when payouts fall on the announcement date ( $t_0$ ), stocks witness an abnormal return of -1.13 percent. They employed two model specifications in this study: a naive model and a modified version of Lintner's (1956) model, which was provided by Fama and Blasiak (1968). Following this study, additional research (e.g., Bozos et al. 2011; Lonie et al. 1996; Nissim and Ziv 2001; Tsai and Wu 2015). Grullon et al. (2005) claim that there is scant empirical support for the dividend-signalling idea. Using a nonlinear earnings model, Grullon et al. (2005) discovered evidence linking changes in the present dividend to future business performance. It is argued that there is some evidence to support the idea that dividend changes can predict future profitability when utilizing a binary model, but no evidence to support this idea when using an interaction model.

Using 620 LSE listed companies, Lonie et al. (1996) found that in the UK to examine whether dividend change announcements have any impact on stock returns. The researchers found statistically and economically significant cumulative anomalous returns of +2.03 percent for dividend increases and -2.15 percent for dividend cutbacks across a two-day event window ( $t-1, t_0$ ). Gunasekarage and Power (2006) produce results that are equivalent when utilising UK data. While profits and economic conditions are taken into account, Bozos et al. (2011) research demonstrates that abnormal returns are magnified in the same direction as dividend changes. Lastly, they argued that during the steady era of 2006–2008 or when the company's economy is developing and stable (i.e., when  $EPS > 0$ , UKESI (UK Economic Sentiment)  $> 100$ ), statements about dividend changes are less significant.

In summary, the evolution of dividend theories, from Lintner's seminal work in 1956 to contemporary perspectives, encompasses the exploration of dividend announcements. Bhattacharya (1979) "bird-in-the-hand" theory responds to the dividend irrelevance hypothesis, while the agency hypothesis, inspired by Jensen's dividend cash flow theory (1986), emphasizes the informative role of dividends. This study centres on the key "dividend-signalling hypothesis," highlighting the informational content inherent in dividend decisions. Dividend policy emerges as a crucial tool for communicating vital information about a company's financial status and future cash flows to shareholders and market participants (Bozos et al. 2011; Boubaker et al. 2024). Empirical findings offer diverse insights into the impact of dividend changes on stock returns, reflecting the ongoing discourse on dividends and their implications in corporate finance dynamics.

### 2.3 Hypothesis development

Financial studies categorize traders into two groups: uniformed or knowledgeable, with uniform traders including traditional and sentimental dealers (Shleifer and Vishny 1990). Our inquiry focuses on the empirical factors influencing stock prices, particularly the balance between these factors and their impact on stock prices in response to changes in

consumer confidence. The ‘‘negativity effect’’ refers to the idea that negative incentives have a greater influence on a person than positive ones (Peeters and Czapinski, 1990).

The impact can be observed in two ways: (1) when making risky decisions, potential costs are weighted more heavily than potential rewards; and (2) when creating overall judgments, negative information is weighted more strongly than positive information. Prospect theory developed from the original.<sup>1</sup> The ‘‘negativity effect is a behavioural notion characterized by a higher influence of negative stimuli on a person than positive stimuli (Peeters and Czapinski, 1990). The effect can be seen in two ways: (1) possible costs are weighted more heavily than potential rewards when making risky decisions, and (2) negative information is weighted more heavily than positive information when forming overall evaluations. Prospect theory arose from the initial manifestation.

The second manifestation is particularly important in this case since it foretells that investors will react more adversely than positively to news that is bad, which is investor’s reaction based on signal, this reaction explained in signalling theory. Investors adjust their portfolios in the case of a negative (positive) emotion shock that causes the stock market to crash by selling equities and buying bonds (raise). The value of both positive and bad news is equal, providing a symmetrical effect, if you wish to express your emotions. Stock prices need to be monitored. However, the stock market’s reaction to good and bad news would differ if there was a positive–negative asymmetry. Negative sentiment shocks would have an unbalanced direction (the direction of negative sentiment shocks would be unequal). The relative ‘‘importance’’ of the two parties would determine any asymmetry (both good and bad). A certain kind of negativity is indicated by the negativity effect. Asymmetry, or a negative reaction to bad news but a small reaction to good news response to excellent news. In contrast, investors could not have any previous ideas about the information. Investors react by transferring their money out of bonds and into stocks when new information that is thought to be favourable for the future is given. However, if the news is bad, they might decide not to act. In such a situation, a ‘‘positivity effect’’ would be generated.

We can observe that in the case of dividend announcements, if the market receives news of a dividend increase, the market reacts positively, and stock prices rise. On the contrary, if the market receives news of a dividend decrease, the market reacts negatively, and stock prices fall. This is the basic principle explained by the dividend signalling hypothesis. This hypothesis has been empirically tested and supported by various authors (see Grullon et al. 2005; Hasan 2021, 2022).

Drawing insights from Lewicka et al. (1992) and a rich body of psychological literature, including studies by Rozin and Royzman (2001) and Baumeister et al. (2001), we expect that the disclosure of information related to consumer confidence will exert a substantial influence on stock prices. Dividend increase (or decrease) announcements will provide an additional signal to investors. Based on the dividend signaling hypothesis, we know that the market is efficient, but consumer confidence introduces an additional layer of efficiency to the existing market framework. Previous studies have demonstrated that announcements of dividend adjustments, whether upward or downward, significantly impact the stock market,

<sup>1</sup> Veronesi (1999) provides evidence in support of the dynamic, rational expectations equilibrium model of asset prices, showing that investors overreact (underreact) to bad (great) news in good (poor) times. To handle the asymmetric reaction, Veronesi’s model requires ‘‘good time’’ and ‘‘bad time’’ economic states. Prospect theory (Kahneman and Tversky 1979) does not require such circumstances, but there is an asymmetry in the value of gains and losses. On the other hand, prospect theory is unable to predict with any degree of accuracy how investors will react to news that could be good or bad (such as a change in market mood).

influencing its trajectory either positively or negatively. The synthesis of these discussions leads us to articulate the following hypotheses:

**H1** Dividend increase will create positive impact on stock return when consumer confidence is positive.

**H2** Dividend decrease will create negative impact on stock return when consumer confidence is negative.

### 3 Data and methodology

#### 3.1 Data, sample section and variables

This research is based on data from a sample of FTSE-350 companies spanning the period from 1990 to 2021, considering the companies listed at FTSE-350 index as of February 2020. The sampling criteria are detailed below. To maintain consistency in financial record-keeping approaches, the sample excludes utilities and financial industries. Additionally, any interim dividend and stock dividend announcements made during the event period, as outlined by Claessens and Laeven (2006), are excluded. The exclusion of these industries is due to challenges in quantifying profitability and value metrics for financial enterprises and comparing them with organizations in other sectors, given the impact of government rules on the utility industry's valuation and profitability (Claessens and Laeven 2006). To mitigate uncommon fluctuations and reduce the influence of outliers, dividend adjustments are limited to a range of +50% to -50%. Disclosure of prices for the 200 days leading up to the dividend announcement date and the first day after that date is mandatory. Any additional corporate events occurring between  $T - 10$  and  $T + 10$  is disregarded to prevent potential contamination of the findings; examples of such events include earnings releases, stock splits, share repurchases, stock dividends, right issues, mergers, and acquisitions. Active trading for stocks is a prerequisite, and firms with no transactions for more than 100 days during the estimation period are excluded.

We collected data related to consumer confidence from 1990 to December 2021 and closing prices (daily) for our sampled firms for January 1990 to December 2021. Upon implementing such criteria, the sample consists of 231 firms and 4021 observations. Table 1 lists the definitions of every variable.

Table 2 presents the descriptive statistics, while Table 3 displays the correlation matrices for CAR  $[-1, +1]$ . To enhance the robustness of our analysis, we winsorized our data at the 2.5% threshold to mitigate potential outliers (Das et al. 2024). In Table 2, the mean value for dividend changes is 0.098, and the kurtosis value for dividend changes is positive. The UK consumer confidence index exhibits a negative mean value, with skewness also showing a negative value. Table 3 documents pairwise correlation metrics for CAR  $[-1, +1]$ . Notably, we observe a negative connection between dividend yield and dividend changes, while size reversal, momentum, and CAR  $[-1, +1]$  demonstrate positive correlations. Additionally, reversal shows a negative association  $[-1, +1]$  with dividend yield, momentum, and CAR.



**Table 1** Variable definition

Variables	Descriptions
Dividend Changes	Dividend changes is % change in dividend payment for firm $i$
$DPI_{it}$	$DPI_{it}$ takes value 1 if the dividend change is positive, and otherwise 0
$DPD_{it}$	$DPD_{it}$ takes value 1 if the dividend change is negative, and otherwise 0
Consumer confidence	Consumer confidence index value
$CCH_t$	$CCH_t$ is 1 if consumer confidence is positive, and 0 otherwise
$CCID_t$	$CCID_t$ is 1 if consumer confidence is negative, and 0 otherwise
Size	Natural logarithmic of firm's market capitalization
Reversal	Cumulative stock returns over previous month
Momentum	Cumulative monthly stock returns from month $t-12$ to $t-2$
Dividend yield	Ratio of the annual dividend over the price one day prior to the dividend announcement
Shock	Shock is a dummy variable takes value 1 if data falls in year 1995–2001 (Dot-com-Bubble), 2008–2009 (Global financial crisis) and 2020–2021 (COVID-19), and otherwise 0
<i>Yeardummies</i>	<i>YearDummies</i> year dummies from January 1990 to December 2021
<i>Industryeffects</i>	<i>IndustryEffects</i> are the industry dummies, in here we use Fama and French's (FF) 17 industry classifications

This table provide the definitions of the variables

**Table 2** Descriptive statistics

Variables	N	Mean	Std. Div	Min	Median	Max	Skewness	Kurtosis
Dividend changes	4021	0.098	0.131	-0.50	0.095	0.50	-0.748	7.996
Size	4021	3.258	1.397	0.386	4.098	9.061	0.372	3.301
Reversal	4021	0.000	0.004	-0.040	0.001	0.023	-0.636	8.647
Momentum	4021	0.003	0.015	-0.079	0.004	0.063	-0.595	4.937
Dividend yield	4021	0.020	0.013	0.000	0.019	0.128	1.453	9.420
UK consumer confidence index	4021	-1.246	1.431	-9.00	1.00	7.00	0.654	2.694
CAR [-1,1]	4021	0.533	0.162	-0.409	0.011	0.613	-0.049	10.068
CAR [-10,10]	4021	0.920	0.179	-0.642	0.019	0.924	-0.461	8.982

This table provide the descriptive statistics of the variables

### 3.2 Model and method

We employed a typical event study approach and regression analysis to examine the hypotheses outlined above. Dividend-increase (reduction) announcements have a positive (negative) effect on stock market returns, according to the dividend-signalling theory. The dividend-signalling theory is extended in this study, which looks at how consumer confidence impacts the link between dividend announcements and stock market performance.

$[-1, +1]$  and  $[-10, +10]$  are the two CARs we calculated. We employed two distinct linear model specifications to conduct the hypotheses tests. We have two models: a linear binary model and a linear interaction model. The latter, we included two independent

**Table 3** Correlation matrix (CAR [-1,1] and CAR [-10,10])

Variables	<i>RADIV</i>	Size	Reversal	Momentum	Dividend Yield	CAR [-1,1]	CAR [-10,10]
Dividend changes	1.000						
Size	0.061	1.000					
Reversal	0.039	0.026	1.000				
Momentum	0.229	0.106	-0.035	1.000			
Dividend yield	-0.213	-0.220	-0.159	-0.356	1.000		
CAR [-1,1]	0.107	-0.139	-0.084	-0.033	0.048	1.000	
CAR [-10,10]	0.072	-0.105	0.098	-0.153	0.034	0.045	1.000

This table provides the correlation matrix for CAR [-1, + 1] and CAR [-10, 10]

variables that both show interaction effects. The dividend percentage change (*RADIV*), which interacts with a dummy related to increased dividend increase dummy (DPI), is the first independent factor in the linear interaction model. The second is, DPD, the change in dividends that interacts with a dummy for decreasing dividend. Yet, we just included DPI and DPD, two dummy variables, as explanatory variables in our linear binary model.

Following are the calculations for the raw returns:

$$R_{i,t} = \ln(P_{i,t}) - \ln(P_{i,t-1}) \tag{1}$$

The prices of stock *i* on day *t* and day *t-1* are denoted by  $P_{i,t}$  and  $P_{i,t-1}$ , respectively, while the actual return on stock *i* from day *t-1* to day *t* is represented by  $R_{i,t}$ . For every day within the event timeframe, abnormal stock returns are computed as:

$$AR_{i,t} = R_{i,t} - E(R_{i,t}) \tag{2}$$

where  $E(R_{i,t})$  is the expected return on day *t*,  $AR_{i,t}$  indicates anomalous stock returns *i* from day *t-1* to *t*, and  $R_{i,t}$  indicates the actual return on day *t*. In order to determine projected stock returns, we use the market model. To estimate the parameters, we take 181 daily return observations from time *t-200* to time *t-20*, and we the OLS method:

$$E(R_{i,t}) = \alpha_i + \beta_i R_{m,t} + \mu_{i,t} \tag{3}$$

where  $E(R_{i,t})$  is the expected return on stock *i* on day *t*. The FTSE-350 general index, written as  $R_{m,t}$ , represents the market return on day *t*. The random error term is denoted by  $\mu_{i,t}$ , and the market model parameters are  $\alpha_i$  and  $\beta_i$ . The following daily abnormal returns are then averaged over the holdings of companies that increase, decrease, or maintain their dividends:

$$\overline{AR}_t = \frac{\sum_{i=1}^N AR_{it}}{N} \tag{4}$$

where  $\overline{AR}_t$  is the weighted average abnormal exploring increasing, decreasing, or constant dividends.

The cumulative abnormal return (CAR) is measured as :

$$CAR_{it} = \sum_{t=t_1}^{t_2} AR_{it}. \quad (5)$$

here, we employ CAR to for the market response to dividend announcements. Below are the two model specifications, along with full explanations:

i. Linear interaction model specification

$$\begin{aligned} CAR_{it}^{(-1,1)} = & \lambda_0 + \lambda_1 R\Delta DIV_{it} * DPI_{it} + \lambda_2 R\Delta DIV_{it} * DPD_{it} + \lambda_3 R\Delta DIV_{it} * DPI_{it} * CCI_t \\ & + \lambda_4 R\Delta DIV_{it} * DPI_{it} * CCID_t + \lambda_5 R\Delta DIV_{it} * DPD_{it} * CCI_t \\ & + \lambda_6 R\Delta DIV_{it} * DPD_{it} * CCID_t + \lambda_7 SIZE_{it} + \lambda_8 REVERSAL_{it} \\ & + \lambda_9 MOMENTUM_{it} + \lambda_{10} DIVIDEND_{YIELD_{it}} + \lambda_{11} Shock_{it} \\ & + \vartheta_1 Year Dummies + \vartheta_2 Industry Effects + \mu_{it} \end{aligned} \quad (6)$$

where,  $CCI_t$  is consumer confidence index.  $CCI_t$  is 1 if consumer confidence is positive, and 0 otherwise.  $CCID_t$  is 1 if consumer confidence is negative, and 0 otherwise.  $CAR_{it}$  is cumulative abnormal returns.  $R\Delta DIV_{it}$  is % change in paying dividends for firm  $i$ .  $DPI_{it}$  takes value 1 if the dividend change is positive, and otherwise 0.  $DPD_{it}$  takes value 1 if changes in dividends are negative, and otherwise 0.  $SIZE_{it}$  is natural logarithmic of firm's market capitalization.  $REVERSAL_{it}$  is measured as last month's cumulative returns.  $MOMENTUM_{it}$  is measured using the cumulative stock returns- monthly (for  $t-12$  to  $t-2$ ).  $DIVIDEND_{YIELD_{it}}$  is the annual dividend divided by the latest price prior announcing dividend payments. Shock is a dichotomous variable with 1 if data is within the events of: COVID-19 (2020–2021), Global financial crisis (2008–2009) Dot-com-Bubble (1995–2001), and 0 otherwise.  $\mu_{it}$  is Error term. *YearDummies* is year dummies from January 1990 to December 2021. *IndustryEffects* are the industry dummies, in here we use Fama and French's (FF) 17 industry classifications.

ii. Linear binary model specification

$$\begin{aligned} CAR_{it}^{(-1,1)} = & \lambda_0 + \lambda_1 DPI_{it} + \lambda_2 DPD_{it} + \lambda_3 DPI_{it} * CCI_t + \lambda_4 DPI_{it} * CCID_t \\ & + \lambda_5 DPD_{it} * CCI_t + \lambda_6 DPD_{it} * CCID_t + \lambda_7 SIZE_{it} + \lambda_8 REVERSAL_{it} \\ & + \lambda_9 MOMENTUM_{it} + \lambda_{10} DIVIDEND_{YIELD_{it}} + \lambda_{11} Shock_{it} \\ & + \vartheta_1 Year Dummies + \vartheta_2 Industry Effects + \mu_{it} \end{aligned} \quad (7)$$

As in Nissim and Ziv (2001), all of the previously described models are calculated using pooled OLS regressions. We provided cluster-robust standard errors for the statistical inference models, that extend the generalized results for independent heteroscedastic errors. We explain how such standard errors are used to account for the within-cluster error correlations, which can result in small standard errors, leading to low  $p$ -values. We employ multi-way clustering to estimate standard errors in finance panel data sets. The standard deviations are arranged by date and firm.

**Table 4** Abnormal returns

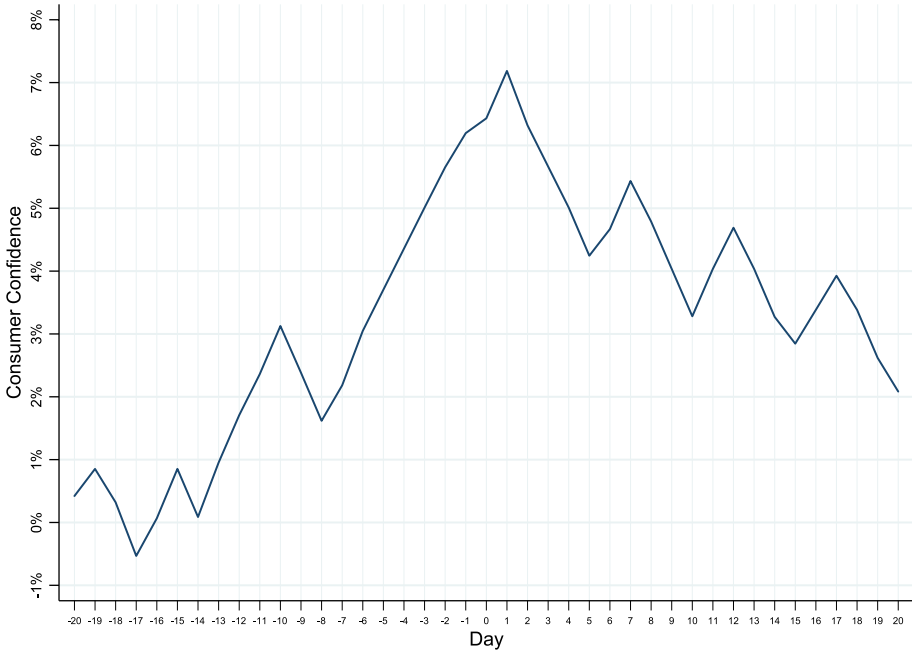
Panel A: Abnormal return			
Day	Consumer confidence	Day	Consumer confidence
-20	0.4212*	1	0.7545**
-19	0.4311*	2	-0.8658
-18	-0.5312	3	-0.6545
-17	-0.8532	4	-0.6547
-16	0.5985	5	-0.7654*
-15	0.7864	6	0.4231
-14	-0.7654**	7	0.7655
-13	0.8650	8	-0.6436
-12	0.7544	9	-0.7544*
-11	0.6544	10	-0.7546*
-10	0.7651	11	0.7554*
-9	-0.7433	12	0.6536*
-8	-0.7647**	13	-0.6538
-7	0.5642***	14	-0.7648
-6	0.8659	15	-0.4256
-5	0.6547	16	0.5376
-4	0.6532	17	0.5425
-3	0.6539*	18	-0.5425
-2	0.6424*	19	-0.7646***
-1	0.5432***	20	-0.5356**
0	0.2353***		
Panel B Cumulative average abnormal return			
$\overline{CAR}[-1, +1]$	0.5330**		
$\overline{CAR}[-10, +10]$	0.9200**		
$\overline{CAR}[-20, +20]$	2.0834***		

This table reports the average abnormal returns,  $\overline{AR}$ , and the cumulative abnormal returns,  $\overline{CAR}$ , of dividend announcements. For both panels, we provide  $\overline{AR}$  and  $\overline{CAR}$  under consumer confidence. In Panel B, we report  $\overline{CAR}$  for the entire event window  $[-20, +20]$ , at and ten day after the announcement and ten days before the announcement  $[-10, +10]$  and around the dividend announcement  $[-1, +1]$ . The sample \*, \*\*, and \*\*\* denote statistical significance at the 10%, 5%, 1% level, respectively

## 4 Results and discussion

### 4.1 Value creation of dividend announcements

Table 4 presents the average abnormal return and cumulative average abnormal returns (expressed in percentage terms) for consumer confidence. These figures reflect the average across the sample during the period surrounding the event day for the specific transaction. Our findings regarding the dividend announcement return for FTSE-350 firms align with previous literature, predominantly centred on developed countries like the UK. In both of



**Fig. 1** (Alt text) Consumer confidence index. This figure contains the cumulative average abnormal returns, CAR, for investor sentiment proxy Consumer Confidence. The CAR is plotted for the 40-day period surrounding the event day, from  $T_2 = -20$  to  $T_3 = 20$ , where  $\tau = 0$  is the announcement day

our event windows, the CAR value is positive and statistically significant. These values signify the average CAR across the sample during the period surrounding the event day for the specific transaction, ranging from  $T_2 = -20$  to  $T_3 = 20$ . Figure 1 visually depicts the plotted CAR for the entire sample.

### 4.2 Linear interaction model

All the results in Table 5 are significant and consistent when consumer confidence index interacted with dividend increase and dividend decrease dummy, and dividend changes. These results indicate that the consumer confidence changes have a significant impact on the association between stock returns and dividend announcements. From the partial effect compute in below we can see that:

$$\left( \frac{\partial CAR_{it}}{\partial R \Delta DIV_{it}} \mid DPI_{it} = 1 \right) = \lambda_1 DPI_{it} + \lambda_3 DPI_{it} * CCI_t \tag{8}$$

$$\Rightarrow \left( \frac{\Delta CAR_{it}}{\Delta R \Delta DIV_{it}} \mid DPI_{it} = 1 \right) = \hat{\lambda}_1 + \hat{\lambda}_3 * CCI_t$$

$$= \hat{\lambda}_1 + \hat{\lambda}_3 * 1 [ \text{If consumer confidence index value is positive, and 0 otherwise} ]$$

**Table 5** Regression analysis of consumer confidence on dividend announcement dates using interaction specification (CAR [-1,1])

Variables	Model 1	Model 2	Model 3	Model 4
Constant	0.05106*** (0.00741)	0.05697*** (0.00962)	0.05244*** (0.01158)	0.05793*** (0.01314)
$R\Delta DIV_{it} * DPI_{it}$	0.01092*** (0.02897)	0.05775*** (0.01459)	0.05299*** (0.00829)	0.05844*** (0.01496)
$R\Delta DIV_{it} * DPD_{it}$	-0.06816** (0.02919)	-0.07884** (0.05536)	-0.06906** (0.05623)	-0.08002** (0.05581)
$R\Delta DIV_{it} * DPI_{it} * CCII_t$	0.06565*** (0.01871)	0.00198*** (0.02309)	0.06553*** (0.01886)	0.00369*** (0.02336)
$R\Delta DIV_{it} * DPI_{it} * CCID_t$	-0.04785*** (0.01309)	-0.00779*** (0.00733)	-0.04841*** (0.01409)	-0.00759** (0.00745)
$R\Delta DIV_{it} * DPD_{it} * CCII_t$	-0.04890*** (0.03653)	-0.00339** (0.00799)	-0.00973** (0.00818)	-0.00335** (0.00809)
$R\Delta DIV_{it} * DPD_{it} * CCID_t$	0.02219** (0.03406)	0.00632** (0.06557)	0.01925** (0.06585)	0.00355** (0.06594)
Size	-0.00602*** (0.00086)	-0.00584*** (0.00091)	-0.00584*** (0.00103)	-0.00556*** (0.00111)
Reversal	-1.19195*** (0.26858)	-1.24221*** (0.39549)	-1.21575*** (0.39518)	-1.26854*** (0.39707)
Momentum	-0.17896** (0.08245)	-0.21120* (0.12416)	-0.19304* (0.11435)	-0.22699* (0.12586)
Dividend yield	0.06828 (0.10188)	0.07280 (0.12869)	0.03242 (0.13506)	0.03377 (0.13342)
Shock	-0.00321* (0.34563)	-0.00429* (0.38693)	-0.00461* (0.37638)	-0.00487* (0.38732)
Year dummies	NO	YES	NO	YES
Industry fixed effects	NO	NO	YES	YES
Clustered by company ID and date	NO	YES	YES	YES
R <sup>2</sup>	4.37%	5.26%	4.51%	5.41%
N	4021	4021	4021	4021

$CCII_t$  is consumer confidence index.  $CCII_t$  is 1 if consumer confidence is positive, and 0 otherwise.  $CCID_t$  is 1 if consumer confidence is negative, and 0 otherwise.  $CAR_{it}$  is cumulative abnormal returns.  $R\Delta DIV_{it}$  is % change in dividend payment for firm  $i$ .  $DPI_{it}$  takes value 1 if the dividend change is positive, and otherwise 0.  $DPD_{it}$  takes value 1 if the dividend change is negative, and otherwise 0.  $SIZE_{it}$  is natural logarithmic of firm's market capitalization.  $REVERSAL_{it}$  is measure using cumulative stock returns over previous month (in percentage).  $MOMENTUM_{it}$  are measures using the cumulative monthly stock returns from month  $t-12$  to  $t-2$ .  $DIVIDEND_{YIELD_{it}}$  is the ratio of the annual dividend over the price one day prior to the dividend announcement. Shock is a dummy variable takes value 1 if data falls in year 1995–2001 (Dot-com-Bubble), 2008–2009 (Global financial crisis) and 2020–2021 (COVID-19), and otherwise 0.  $\mu_{it}$  is Error term.  $YearDummies$  is year dummies from January 1990 to December 2021.  $IndustryEffects$  are the industry dummies, in here we use Fama and French's (FF) 17 industry classifications. Significant coefficients are highlighted and superscripts \*\*\*, \*\* and \* denote statistical significance at the 1%, 5% and 10% level, respectively. Standard errors are in parenthesis

**Table 6** Partial derivatives for consumer confidence effect on dividend announcement dates using interaction specification

Variables	Model 1	Model 2	Model 3	Model 4
$\lambda_1DPI_{it} + \lambda_3DPI_{it} * CCII_t$	0.07657	0.05973	0.11852	0.06213
$\lambda_1DPI_{it} + \lambda_4DPI_{it} * CCID_t$	-0.03693	0.04996	0.00458	0.05085
$\lambda_2DPD_{it} + \lambda_5DPD_{it} * CCII_t$	-0.11706	-0.08223	-0.07879	-0.08337
$\lambda_2DPD_{it} + \lambda_6DPD_{it} * CCID_t$	-0.04597	-0.07252	-0.04981	-0.07647

This tables reports the partial effect of a dividend announcements on the CAR with joint consideration of a consumer confidence index. The dummy variables  $DPD=1$  if the dividend changes percentage decrease, otherwise 0.  $Z_t$  is consumer confidence index.  $CCII_t$  is 1 if consumer confidence is positive, and 0 otherwise.  $CCID_t$  is 1 if consumer confidence is negative, and 0 otherwise. From Eqs. (8) to (11) the partial derivatives are calculated as  $\left(\frac{\partial CAR_{it}}{\partial R\Delta DIV_{it}}|DPD_{it} = 1\right) = \lambda_2DPD_{it} + \lambda_4DPD_{it} * Z_t$ . The sample period is from January 1990 to December 2021

$$\left(\frac{\partial CAR_{it}}{\partial R\Delta DIV_{it}}|DPI_{it} = 1\right) = \lambda_1DPI_{it} + \lambda_4DPI_{it} * CCID_t \tag{9}$$

$$\Rightarrow \left(\frac{\Delta CAR_{it}}{\Delta R\Delta DIV_{it}}|DPI_{it} = 1\right) = \hat{\lambda}_1 + \hat{\lambda}_4 * CCID_t$$

=  $\hat{\lambda}_1 + \hat{\lambda}_4 * 1$ [1 If consumer confidence index value is negative, and 0 otherwise]

$$\left(\frac{\partial CAR_{it}}{\partial R\Delta DIV_{it}}|DPD_{it} = 1\right) = \lambda_2DPD_{it} + \lambda_5DPD_{it} * CCII_t \tag{10}$$

$$\Rightarrow \left(\frac{\Delta CAR_{it}}{\Delta R\Delta DIV_{it}}|DPD_{it} = 1\right) = \hat{\lambda}_2 + \hat{\lambda}_5 * CCII_t$$

=  $\hat{\lambda}_2 + \hat{\lambda}_5 * 1$ [1 If consumer confidence index value is positive, and 0 otherwise]

$$\left(\frac{\partial CAR_{it}}{\partial R\Delta DIV_{it}}|DPD_{it} = 1\right) = \lambda_2DPD_{it} + \lambda_6DPD_{it} * CCID_t \tag{11}$$

$$\Rightarrow \left(\frac{\Delta CAR_{it}}{\Delta R\Delta DIV_{it}}|DPD_{it} = 1\right) = \hat{\lambda}_2 + \hat{\lambda}_6 * CCID_t$$

=  $\hat{\lambda}_2 + \hat{\lambda}_6 * 1$ [1 If consumer confidence index value is negative, and 0 otherwise].

Joint significant test results in Table 5 suggests that model four is more significant for all four Eqs. (3–6) than other three models. Table 6 indicates that 10% dividend increase boosts stock return by 0.6213% in model 4, when consumer confidence is positive. If dividend increase but consumer confidence index is negative still, we observe positive or increased stock returns in model 2–4, but model 1 shows deceased stock returns. Similarly, if dividend decrease by 10%, then stock return also reduced by 0.8337% in model 4, when consumer confidence index is positive. We found similar kind of results when dividend decrease, and consumer confidence is negative. The findings indicate that fluctuations

in consumer confidence significantly influence the relationship between dividend announcements and stock returns. This aligns with our hypotheses (H1 and H2) and is in line with previous research by Zorio-Grima and Merello (2020) and Kim et al. (2023). This consistency reinforces the robustness of our results within the existing literature. The observed influence shows the interplay between market sentiments and financial decisions, emphasizing the need for stakeholders to consider consumer confidence dynamics when making financial decisions.

### 4.3 Linear binary model

From Table 7 we can report that dividend-increase dummy and dividend-decrease dummy both findings in line with prior research and the dividend signalling theory. All the results are significant and consistent when consumer confidence index interacted with dividend increase and dividend decrease dummy. The results suggest that alterations in consumer confidence significantly affect the association between stock returns and increasing dividend announcements, in line with our hypotheses (H1 and H2). This aligns with the broader theme observed in our study regarding the substantial impact of consumer confidence on stock market dynamics. The validation of our hypotheses in this context emphasizes the importance of considering consumer sentiment when analyzing the reactions to dividend-increase announcements in the stock market. This result is consistent with our findings from linear interaction model specification. From the partial effect compute in below we can see that:

$$\left( \frac{\partial CAR_{it}}{\partial R\Delta DIV_{it}} | DPI_{it} = 1 \right) = \lambda_1 DPI_{it} + \lambda_3 DPI_{it} * CCII_t \tag{12}$$

$$\Rightarrow \left( \frac{\Delta CAR_{it}}{\Delta R\Delta DIV_{it}} | DPI_{it} = 1 \right) = \hat{\lambda}_1 + \hat{\lambda}_3 * CCII_t$$

$$= \hat{\lambda}_1 + \hat{\lambda}_3 * 1[1 \text{ If consumer confidence index value is positive, and 0 otherwise}]$$

$$\left( \frac{\partial CAR_{it}}{\partial R\Delta DIV_{it}} | DPI_{it} = 1 \right) = \lambda_1 DPI_{it} + \lambda_4 DPI_{it} * CCID_t \tag{13}$$

$$\Rightarrow \left( \frac{\Delta CAR_{it}}{\Delta R\Delta DIV_{it}} | DPI_{it} = 1 \right) = \hat{\lambda}_1 + \hat{\lambda}_4 * CCID_t$$

$$= \hat{\lambda}_1 + \hat{\lambda}_4 * 1[1 \text{ If consumer confidence index value is negative, and 0 otherwise}]$$

$$\left( \frac{\partial CAR_{it}}{\partial R\Delta DIV_{it}} | DPD_{it} = 1 \right) = \lambda_2 DPD_{it} + \lambda_5 DPD_{it} * CCII_t \tag{14}$$

$$\Rightarrow \left( \frac{\Delta CAR_{it}}{\Delta R\Delta DIV_{it}} | DPD_{it} = 1 \right) = \hat{\lambda}_2 + \hat{\lambda}_5 * CCII_t$$

$$= \hat{\lambda}_2 + \hat{\lambda}_5 * 1[1 \text{ If consumer confidence index value is positive, and 0 otherwise}]$$



**Table 7** Regression analysis of consumer confidence on dividend announcement dates using binary specification (CAR [-1,1])

Variables	Model 1	Model 2	Model 3	Model 4
Constant	0.04856*** (0.00772)	0.05532*** (0.01024)	0.04913*** (0.01145)	0.05519*** (0.01334)
$DPI_{it}$	0.00702*** (0.02343)	0.03369*** (0.00457)	0.03066*** (0.00636)	0.03441*** (0.00401)
$DPD_{it}$	-0.01150** (0.00941)	-0.01456* (0.00975)	-0.01214* (0.00944)	-0.01519* (0.00979)
$DPI_{it} * CCI_t$	0.01523*** (0.00418)	0.01409*** (0.00489)	0.01466*** (0.00422)	0.01348*** (0.00493)
$DPI_{it} * CCID_t$	-0.01217*** (0.00385)	-0.01387*** (0.00398)	-0.01149*** (0.00391)	-0.01311*** (0.00404)
$DPD_{it} * CCI_t$	-0.01974*** (0.00461)	-0.02220** (0.02150)	-0.02577** (0.01571)	-0.02212** (0.02179)
$DPD_{it} * CCID_t$	0.00534** (0.01053)	0.00035** (0.01114)	0.00502** (0.01057)	0.00016* (0.01119)
Size	-0.00628*** (0.00086)	-0.00615*** (0.00090)	-0.00613*** (0.00097)	-0.00593*** (0.00101)
Reversal	-1.19568*** (0.26879)	-1.23328*** (0.27666)	-1.21716*** (0.27079)	-1.25588*** (0.27847)
Momentum	-0.15966* (0.08229)	-0.18642** (0.09116)	-0.17069** (0.08286)	-0.19854** (0.09178)
Dividend yield	0.02861 (0.10121)	0.02033 (0.10226)	0.00429 (0.10554)	0.01444 (0.10664)
Shock	-0.00439* (0.34536)	-0.00235* (0.34656)	-0.00372* (0.32964)	-0.00389* (0.32422)
Year dummies	NO	YES	NO	YES
Industry fixed effects	NO	NO	YES	YES
Clustered by company ID and date	NO	YES	YES	YES
$R^2$	4.09%	4.88%	4.20%	4.98%
$N$	4021	4021	4021	4021

$CCI_t$  is consumer confidence index.  $CCI_t$  is 1 if consumer confidence is positive, and 0 otherwise.  $CCID_t$  is 1 if consumer confidence is negative, and 0 otherwise.  $CAR_{it}$  is cumulative abnormal returns.  $R\Delta DIV_{it}$  is % change in dividend payment for firm  $i$ .  $DPI_{it}$  takes value 1 if the dividend change is positive, and otherwise 0.  $DPD_{it}$  takes value 1 if the dividend change is negative, and otherwise 0.  $SIZE_{it}$  is natural logarithmic of firm's market capitalization.  $REVERSAL_{it}$  is measure using cumulative stock returns over previous month (in percentage).  $MOMENTUM_{it}$  are measures using the cumulative monthly stock returns from month  $t-12$  to  $t-2$ .  $DIVIDEND_{YIELD_{it}}$  is the ratio of the annual dividend over the price one day prior to the dividend announcement. Shock is a dummy variable takes value 1 if data falls in year 1995–2001 (Dot-com-Bubble), 2008–2009 (Global financial crisis) and 2020–2021 (COVID-19), and otherwise 0.  $\mu_{it}$  is Error term.  $YearDummies$  is year dummies from January 1990 to December 2021.  $IndustryEffects$  are the industry dummies, in here we use Fama and French's (FF) 17 industry classifications. Significant coefficients are highlighted and superscripts \*\*\*, \*\* and \* denote statistical significance at the 1%, 5% and 10% level, respectively. Standard errors are in parenthesis

**Table 8** Partial derivatives for consumer confidence effect on dividend announcement dates using binary specification

Variables	Model 1	Model 2	Model 3	Model 4
$\lambda_1 DPI_{it} + \lambda_3 DPI_{it} * CCII_t$	0.02225	0.04778	0.04532	0.04789
$\lambda_1 DPI_{it} + \lambda_4 DPI_{it} * CCID_t$	-0.00515	0.01982	0.01917	0.02130
$\lambda_2 DPD_{it} + \lambda_5 DPD_{it} * CCII_t$	-0.03124	-0.03676	-0.03791	-0.03731
$\lambda_2 DPD_{it} + \lambda_6 DPD_{it} * CCID_t$	-0.00616	-0.01421	-0.00712	-0.01503

This tables reports the partial effect of a dividend announcements on the CAR with joint consideration of a consumer confidence index. The dummy variables  $DPD = 1$  if the dividend changes percentage decrease, otherwise 0.  $Z_t$  is consumer confidence index.  $CCII_t$  is 1 if consumer confidence is positive, and 0 otherwise.  $CCID_t$  is 1 if consumer confidence is negative, and 0 otherwise. From Eqs. (12) to (15) the partial derivatives are calculated as  $\left(\frac{\partial CAR_{it}}{\partial R \Delta DIV_{it}} | DPD_{it} = 1\right) = \lambda_2 DPD_{it} + \lambda_4 DPD_{it} * Z_t$ . The sample period is from January 1990 to December 2021

$$\left(\frac{\partial CAR_{it}}{\partial R \Delta DIV_{it}} | DPD_{it} = 1\right) = \lambda_2 DPD_{it} + \lambda_6 DPD_{it} * CCID_t \tag{15}$$

$$\Rightarrow \left(\frac{\Delta CAR_{it}}{\Delta R \Delta DIV_{it}} | DPD_{it} = 1\right) = \hat{\lambda}_2 + \hat{\lambda}_6 * CCID_t$$

=  $\hat{\lambda}_2 + \hat{\lambda}_6 * 1$  [1 If consumer confidence index value is negative, and 0 otherwise].

Joint significant test results in Table 7 suggests that model four is more significant for all four Eqs. (7–10) than other three models. Table 8 indicates that 10% dividend payments increase improves stock return by 0.4789% in model 4, when consumer confidence is positive. If dividend payments increase but consumer confidence index is negative still, we observe positive or increased stock returns in model 2–4, but model 1 shows deaceded stock returns. Similarly, if dividend payments decrease by 10%, then stock return also reduced by 0.3731% in model 4, when consumer confidence index is positive. We found similar kind of results when dividend decrease, and consumer confidence is negative. These results are consistent with our baseline model (interaction model) results and in compliance with the dividend signalling theory. These results are consistent with our findings from linear interaction model (where our H1 and H2 were accepted) and previous literature (see, Zorio-Grima and Merello 2020; Kim et al. 2023), where we can that consumer confidence changes have a significant impact on the association between stock returns and dividend announcements.

#### 4.4 Robustness test

In the previous section, we used a 3-day event window, or CAR [- 1, + 1], and in this section, we used a 10-day event window, or CAR [- 10, + 10]. This ten-day event frame includes the dividend announcement day  $t0$ , 10 days before the announcement  $t-10$  and the 10 days following the dividend announcement day  $t10$ .

The market’s ability to analyse event data objectively is one of the event window’s key tenets. Thus, we can see how the dividend announcement affects stock market

**Table 9** Regression analysis of consumer confidence on dividend announcement dates using interaction specification [CAR (-10,10)]

Variables	Model 1	Model 2	Model 3	Model 4
Constant	0.06174*** (0.00948)	0.07561*** (0.01241)	0.05436*** (0.01322)	0.06825*** (0.01483)
$R\Delta DIV_{it} * DPI_{it}$	0.00853*** (0.13792)	0.07007*** (0.01737)	0.02548*** (0.09383)	0.07224*** (0.01776)
$R\Delta DIV_{it} * DPD_{it}$	-0.06469* (0.03734)	-0.08337* (0.07318)	-0.06451* (0.07497)	-0.08326* (0.07397)
$R\Delta DIV_{it} * DPI_{it} * CCI_t$	0.03746* (0.02393)	0.06311* (0.03475)	0.03739** (0.02809)	0.06524* (0.03472)
$R\Delta DIV_{it} * DPI_{it} * CCID_t$	-0.05730*** (0.01674)	-0.06006*** (0.22681)	-0.05965*** (0.01743)	-0.06171*** (0.03743)
$R\Delta DIV_{it} * DPD_{it} * CCI_t$	-0.03646** (0.14439)	-0.12945* (0.18886)	-0.01766* (0.09246)	-0.13331* (0.22824)
$R\Delta DIV_{it} * DPD_{it} * CCID_t$	0.05396* (0.04611)	0.02971* (0.08121)	0.05305* (0.08283)	0.02922* (0.08202)
Size	-0.00588*** (0.00110)	-0.00551*** (0.00122)	-0.00567*** (0.00134)	-0.00523*** (0.00143)
Reversal	-1.67365*** (0.34363)	-1.62088*** (0.55588)	-1.71435*** (0.54589)	-1.65491*** (0.55324)
Momentum	-0.84221*** (0.10549)	-0.89731*** (0.15670)	-0.84613*** (0.14335)	-0.90298*** (0.15878)
Dividend Yield	-0.10516 (0.13034)	-0.08906 (0.13738)	-0.11038 (0.14706)	-0.10089 (0.14344)
Shock	-0.00325* (0.23871)	-0.00342* (0.37613)	-0.00313* (0.39812)	-0.00301* (0.32965)
Year Dummies	NO	YES	NO	YES
Industry Fixed Effects	NO	NO	YES	YES
Clustered by Company ID and Date	NO	YES	YES	YES
$R^2$	5.36%	6.38%	5.61%	6.63%
$N$	4021	4021	4021	4021

$CCI_t$  is consumer confidence index.  $CCII_t$  is 1 if consumer confidence is positive, and 0 otherwise.  $CCID_t$  is 1 if consumer confidence is negative, and 0 otherwise.  $CAR_{it}$  is cumulative abnormal returns.  $R\Delta DIV_{it}$  is % change in dividend payment for firm  $i$ .  $DPI_{it}$  takes value 1 if the dividend change is positive, and otherwise 0.  $DPD_{it}$  takes value 1 if the dividend change is negative, and otherwise 0.  $SIZE_{it}$  is natural logarithmic of firm's market capitalization.  $REVERSAL_{it}$  is measure using cumulative stock returns over previous month (in percentage).  $MOMENTUM_{it}$  are measures using the cumulative monthly stock returns from month  $t-12$  to  $t-2$ .  $DIVIDEND_{YIELD_{it}}$  is the ratio of the annual dividend over the price one day prior to the dividend announcement. Shock is a dummy variable takes value 1 if data falls in year 1995–2001 (Dot-com-Bubble), 2008–2009 (Global financial crisis) and 2020–2021 (COVID-19), and otherwise 0.  $\mu_{it}$  is Error term.  $YearDummies_{it}$  is year dummies from January 1990 to December 2021.  $IndustryEffects$  are the industry dummies, in here we use Fama and French's (FF) 17 industry classifications. Significant coefficients are highlighted and superscripts \*\*\*, \*\* and \* denote statistical significance at the 1%, 5% and 10% level, respectively. Standard errors are in parenthesis

**Table 10** Regression analysis of consumer confidence on dividend announcement dates using binary specification (CAR [-10,10])

Variables	Model 1	Model 2	Model 3	Model 4
Constant	0.06066*** (0.00988)	0.07489*** (0.01268)	0.05204*** (0.01358)	0.06571*** (0.01518)
$DPI_{it}$	0.03523*** (0.01196)	0.00122*** (0.02395)	0.05317*** (0.02945)	0.05881*** (0.02302)
$DPD_{it}$	-0.01163* (0.01203)	-0.01777* (0.02071)	-0.01185* (0.02107)	-0.01788* (0.02087)
$DPI_{it} * CCI_t$	0.00958* (0.00535)	0.00456* (0.00774)	0.00908* (0.00635)	0.00418* (0.00775)
$DPI_{it} * CCID_t$	-0.01014** (0.00493)	-0.01258** (0.00579)	-0.00992* (0.00573)	-0.01231** (0.00591)
$DPD_{it} * CCI_t$	-0.04271** (0.01018)	-0.01061** (0.01975)	-0.06118** (0.02882)	-0.05402** (0.03728)
$DPD_{it} * CCID_t$	0.01626** (0.01348)	0.00819* (0.02305)	0.01617* (0.02296)	0.00837* (0.02329)
Size	-0.00595*** (0.00111)	-0.00559*** (0.00123)	-0.00576*** (0.00137)	-0.00537*** (0.00145)
Reversal	-1.65836*** (0.34401)	-1.62148*** (0.54884)	-1.70201*** (0.53997)	-1.66065*** (0.54728)
Momentum	-0.81778*** (0.10532)	-0.87182*** (0.15591)	-0.81858*** (0.14329)	-0.87297*** (0.15836)
Dividend yield	-0.15335 (0.12954)	-0.15071 (0.14116)	-0.15586 (0.14931)	-0.15658 (0.14803)
Shock	-0.00352* (0.26454)	-0.00375* (0.27465)	-0.00336* (0.27514)	-0.00383* (0.28364)
Year dummies	NO	YES	NO	YES
Industry fixed effects	NO	NO	YES	YES
Clustered by company ID and date	NO	YES	YES	YES
$R^2$	5.04%	5.96%	5.25%	6.17%
$N$	4021	4021	4021	4021

$CCI_t$  is consumer confidence index.  $CCI_t$  is 1 if consumer confidence is positive, and 0 otherwise.  $CCID_t$  is 1 if consumer confidence is negative, and 0 otherwise.  $CAR_{it}$  is cumulative abnormal returns.  $R\Delta DIV_{it}$  is % change in dividend payment for firm  $i$ .  $DPI_{it}$  takes value 1 if the dividend change is positive, and otherwise 0.  $DPD_{it}$  takes value 1 if the dividend change is negative, and otherwise 0.  $SIZE_{it}$  is natural logarithmic of firm's market capitalization.  $REVERSAL_{it}$  is measure using cumulative stock returns over previous month (in percentage).  $MOMENTUM_{it}$  are measures using the cumulative monthly stock returns from month  $t-12$  to  $t-2$ .  $DIVIDEND_{YIELD_{it}}$  is the ratio of the annual dividend over the price one day prior to the dividend announcement. Shock is a dummy variable takes value 1 if data falls in year 1995–2001 (Dot-com-Bubble), 2008–2009 (Global financial crisis) and 2020–2021 (COVID-19), and otherwise 0.  $\mu_{it}$  is Error term.  $YearDummies$  is year dummies from January 1990 to December 2021.  $IndustryEffects$  are the industry dummies, in here we use Fama and French's (FF) 17 industry classifications. Significant coefficients are highlighted and superscripts \*\*\*, \*\* and \* denote statistical significance at the 1%, 5% and 10% level, respectively. Standard errors are in parenthesis

**Table 11** GMM results (CAR [-1,1])

Interaction model		Binary model	
Variables	CAR (-1,1)	Variables	CAR (-1,1)
Constant	0.18272*** (4.29101)	Constant	0.04443** (0.02177)
$R\Delta DIV_{it} * DPI_{it}$	0.59455** (17.77753)	$DPI_{it}$	0.01567** (0.05314)
$R\Delta DIV_{it} * DPD_{it}$	-0.66919* (0.27353)	$DPD_{it}$	-0.36933* (0.69831)
$R\Delta DIV_{it} * DPI_{it} * CCI_t$	0.00305* (0.90207)	$DPI_{it} * CCI_t$	0.08876* (0.15182)
$R\Delta DIV_{it} * DPI_{it} * CCID_t$	-0.24876* (0.43786)	$DPI_{it} * CCID_t$	-0.20879* (0.38632)
$R\Delta DIV_{it} * DPD_{it} * CCI_t$	-0.91273** (0.19617)	$DPD_{it} * CCI_t$	-1.26789* (2.29222)
$R\Delta DIV_{it} * DPD_{it} * CCID_t$	0.54786* (0.10109)	$DPD_{it} * CCID_t$	0.11984* (0.08849)
Size	-0.02109** (0.48693)	Size	-0.00414** (0.00531)
Reversal	-0.50017* (0.95155)	Reversal	-1.28341* (0.94601)
Momentum	-2.02391 (0.46806)	Momentum	-0.54504 (0.65696)
Dividend yield	0.85764 (0.35898)	Dividend yield	0.43483 (0.90337)
Shock	-0.00369* (0.27652)	Shock	-0.00373 (0.25342)
<i>N</i>	4021	<i>N</i>	4021

$CCI_t$  is consumer confidence index.  $CCI_t$  is 1 if consumer confidence is positive, and 0 otherwise.  $CCID_t$  is 1 if consumer confidence is negative, and 0 otherwise.  $CAR_{it}$  is cumulative abnormal returns.  $R\Delta DIV_{it}$  is % change in dividend payment for firm  $i$ .  $DPI_{it}$  takes value 1 if the dividend change is positive, and otherwise 0.  $DPD_{it}$  takes value 1 if the dividend change is negative, and otherwise 0.  $SIZE_{it}$  is natural logarithmic of firm's market capitalization.  $REVERSAL_{it}$  is measure using cumulative stock returns over previous month (in percentage).  $MOMENTUM_{it}$  are measures using the cumulative monthly stock returns from month  $t-12$  to  $t-2$ .  $DIVIDEND_{YIELD_{it}}$  is the ratio of the annual dividend over the price one day prior to the dividend announcement. Shock is a dummy variable takes value 1 if data falls in year 1995–2001 (Dot-com-Bubble), 2008–2009 (Global financial crisis) and 2020–2021 (COVID-19), and otherwise 0.  $\mu_{it}$  is Error term.  $YearDummies$  is year dummies from January 1990 to December 2021.  $IndustryEffects$  are the industry dummies, in here we use Fama and French's (FF) 17 industry classifications. Significant coefficients are highlighted and superscripts \*\*\*, \*\* and \* denote statistical significance at the 1%, 5% and 10% level, respectively. Standard errors are in parenthesis

prices, depending on how fast the market can integrate information and whether this information has any direct impact on company values. Based on the Efficient Market Hypothesis (EMH), the market has to respond effectively. We thus examine in this section whether there is any empirical support for the claim that results based on an 11-day

event window differ from those based on a 3-day event window. All our independent and controls variables are same except our depended variable.

When we look at the results of this section, we can see that although though the robustness test was performed using a different event window, the outcomes for both specifications for all four models are comparable to those from the previous section (see Table 9 and 10). This demonstrates the validity of our previous results based on our H1 and H2, and previous literature in this area (see, Zorio-Grima and Merello 2020; Kim et al. 2023). The consistent confirmation of our hypotheses and existing research shows the reliability and robustness of our results. Thus, strengthens the overall contribution of our study in understanding the dynamics between dividend-related announcements and stock returns, providing a valuable addition to the existing body of literature in this domain.

#### 4.5 Further robustness tests

We performed a further robustness analysis using system GMM estimate. We employed the system GMM technique because, according to Asongu et al. (2018), it works well with panel data structures and panel data sets that have short cross-sectional and temporal dimensions ( $T=32$  and  $N=4,021$ , respectively). Numerous problems, including as endogeneity, unobserved heterogeneity, measurement errors, and bias from missing variables, can result from reverse causality. With these issues, system GMM estimate might be useful (Alam et al. 2019; Hasan et al. 2022; Mthanti and Ojah 2017).

Further robustness tests based on GMM estimate are included in Table 11. We used the system GMM estimate in this case. We used a whole data sample for GMM estimation, and we used CAR  $[-1, +1]$ . The stock market's reaction to dividend announcements is different on consumer confidence is positive (negative), according to both the interaction and binary models. This outcome is identical to what we found in our primary and secondary tests, and these results are consistent with previous literature (Acuna et al. 2020; Hampson et al. 2021). This shows that shifts in consumer confidence have a notable impact on the relationship between dividend announcements and stock returns, demonstrating the validity of our H1 and H2. The observed influence shows the importance of consumer sentiment in shaping the dynamics of this relationship.

## 5 Conclusion

This study makes a significant contribution to the evolving landscape of stock price dynamics, shedding light on the importance of investor sentiment. By investigating the intricate relationships among well-established consumer confidence metrics, dividend announcements, and stock indices, our research has unveiled clear interactions within the financial context. Employing two distinct model assumptions, one considering both the size and direction of dividend changes, and the other disregarding magnitude, we aimed to reveal the impact of consumer confidence on the stock market's response to dividend announcements. Our investigation yielded compelling outcomes across both model specifications.

Notably, when examining the magnitude and direction of dividend adjustments, a key observation emerged: the stock market exhibited a more negative reaction to dividend

reduction announcements during periods of negative consumer confidence. Conversely, our findings revealed a positive stock market response to dividend-increase announcements during phases of positive consumer confidence. These results remained consistent when employing alternative CAR and system GMM estimation techniques, reinforcing the robustness of our evidence.

Therefore, our study provides robust evidence affirming that changes in consumer confidence wield a substantial influence on the intricate relationship between dividend announcements and stock returns. This shows the significant role of investor sentiment in shaping market reactions, offering valuable insights for investors, policymakers, and scholars navigating the complex dynamics of financial markets.

However, it is key to acknowledge certain limitations. Firstly, our research is confined to a specific timeframe and the FTSE-350 index, potentially limiting the generalizability of our findings to broader market contexts. Additionally, while the employed consumer confidence measures are widely recognized, they may not capture the full spectrum of investor sentiment. Furthermore, market dynamics are influenced by various factors, and our study does not comprehensively account for all possible variables that could impact stock reactions. Future research could address these limitations by exploring a broader range of indices, extending the temporal scope, and incorporating additional sentiment indicators for a more comprehensive understanding of market behaviour.

To recap, our study advances the understanding of the intricate interplay between consumer confidence, dividend announcements, and stock indices, while also highlighting avenues for future research to refine and broaden our insights into the complex dynamics of financial markets.

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**Data availability** All relevant data and materials are available.

**Code availability** Not Applicable.

## Declarations

**Conflict of interest** Not Applicable.

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