

Full Length Article

Investor sentiment, corporate social responsibility, and financial performance: Evidence from Japanese companies

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Abstract

Utilizing data from 367 Japanese companies from 2005 to 2019, this paper investigates the relationship between investor sentiment, corporate social performance (CSP), and financial performance (FP). The empirical results obtained from the panel fixed effects and instrumental variable regressions reveal a positive impact of firm-specific sentiment on future FP. Conversely, the market sentiment effect is mixed as it positively influences *Tobin's Q* but negatively influences the return on assets (*ROA*). The impact of CSP, measured by environmental, social, and governance (ESG) scores, on FP is similar to that of market sentiment. Specifically, we find that an effective ESG performance in the prior year, both the overall performance and the performance of the individual aspects, can escalate firm value but diminish firm profitability in the following year. We claim that the CSP–FP relationship weakens under the moderating influence of investor sentiment.

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1. Introduction

Financial performance (FP) refers to how well a company raises, manages, and uses capital in its business activities. FP can be used as a general indicator of a company's overall financial health in a given period. It is also of interest to both the internal and external stakeholders of firms, including managers, employees, providers, creditors, and stockholders. These stakeholders have different interests. For example, investors pay more attention to a company's present and future earnings; trade creditors are keen on its liquidity, whereas bondholders are attracted to its cash flow ability.

From a broader perspective, a company's performance not only affects the parties involved but also is fundamental to sustainable economic development (Škare & Hasić, 2016). Therefore, knowing factors that can influence corporate FP to

understand and enhance its effectiveness is vital. Besides traditional variables, such as firm size, liquidity, capital structure, corporate governance, and macroeconomic conditions, in recent times, there has been an increasing interest in the relationship of corporate social performance (CSP) and investor sentiment with FP among researchers and practitioners. CSP is defined as a business organization's configuration of social responsibility principles, social responsiveness processes, and observable outcomes related to its societal relationships (Wood, 1991). Moreover, investor sentiment is a belief about future cash flows and investment risks that is not justified by the facts at hand (Baker & Wurgler, 2007). Despite being examined comprehensively, the CSP–FP relationship is still inconclusive. Previous studies have found a positive relationship (Minutolo et al., 2019; Velte, 2017), a negative relationship (Duque-Grisales & Aguilera-Caracuel, 2021), an insignificant relationship (Atan et al., 2018; Peng & Yang, 2014), and different casual relationships (Han et al., 2016). On the other hand, most of the sentiment–FP research focuses

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on the impact of investor sentiment on stock returns (Brown & Cliff, 2004; Corredor et al., 2013) and neglects the relationship between sentiment and other FP indicators.

This study aims to address these issues. It contributes to the financial literature in the following ways. First, using Japanese corporate data from 2005 to 2019, we provide more recent and detailed evidence about the driving factors that influence firm FP, focusing on CSP and investor sentiment. Second, as investor sentiment can serve as a motivator for both CSP and FP, we find how investor mood affects the CSP–FP relationship, which has never been investigated. Several years ago, environmental, social, and governance (ESG) investment had not yet spread in Japan. In 2014, the total amount of Japanese responsible investing assets was 7.642 billion US dollars, whereas those of the EU and the U.S. were 13,608 and 6572 billion US dollars, respectively. In recent times, this situation has been improving; the improvement is led by government reforms, demand from local pension funds, and foreign investors' expectations. According to the *Global Sustainable Investment Review (2019)*, sustainable investing assets in Japan quadrupled from 2016 to 2018 before reaching 3210 billion US dollars in 2019—a 45% growth over that of the prior year. However, Japan still lagged significantly behind other developed nations. Furthermore, one of the objectives of “Abenomics” is to redirect Japanese firms' priorities toward their shareholders and better orient them with modern global investors' expectations. Therefore, an exclusive study to better understand the relationship between investors, CSP, and FP in Japanese companies is necessary.

The remaining parts of the paper are structured as follows. Section 2 reviews prior relevant studies and presents our main hypotheses. Section 3 describes the sample, variables, and analysis models briefly. Section 4 discusses the empirical results, whereas the primary findings are presented in the final part.

2. Literature review and hypotheses development

2.1. Investor sentiment and FP

From the perspective of behavioral finance, investor sentiment has been proved to influence a company's stock price (Baker & Wurgler, 2007; Brown & Cliff, 2004; Corredor et al., 2013), thereby affecting its market value. When sentiment is high, i.e., in bull markets, stock prices tend to increase more than their fundamental value. Conversely, in low sentiment or bear markets, stocks tend to be underpriced. According to Brown and Cliff (2004), investor sentiment affects stock prices by changing investor expectations about liquidity. However, Baker and Wurgler (2007) suggested that investor sentiment affects investors' risk tolerance and thus stock prices.

Additionally, investor sentiment can also affect firm managers' decisions (Chen et al., 2019; Cheong et al., 2017; Naughton et al., 2019; Zhaohui & Wensheng, 2013). For instance, Zhaohui and Wensheng (2013) stated that the stock mispricing caused by investor sentiment has a strong relationship with a firm's investment level. They assumed that

companies are motivated to cater to investor sentiment and invest in inefficient opportunities when their stocks are overvalued, and they ignore potential opportunities when their stocks are undervalued. Investor sentiment also has a positive impact on the probability of seasoned equity offerings (SEOs), according to Chen et al. (2019). Furthermore, the authors reported that compared with firms conducting SEOs during low sentiment periods, firms conducting SEOs during high sentiment periods experience less severe short-run price drops around the issuance but more severe post-issue long-run underperformance. These decisions affect firm FP. Shi and Zhang (2010) employed data from Chinese listed companies to form a composite index of firm performance using nine underlying proxies, including return on assets (ROA), return on equity (ROE), earnings per share, and *Tobin's Q*, and found a negative impact of investor sentiment on future corporate FP. They argued that investor positiveness leads firms to overinvestment; thus, their FP should deteriorate after investments are made in investors' optimistic states. However, firms tend to decrease investment and choose only the worthiest investment projects during investors' pessimistic states. Therefore, these investments should enhance corporate performance. This viewpoint is supported by the study of Arif and Lee (2014) about companies in the U.S. In contrast, Cheng (2019) used data from Taiwanese listed companies from 2007 to 2014 and revealed that trading volume, which was the sentiment proxy, relates positively to future operating return ratio. Similarly, Zainudin et al. (2019) constructed a sentiment index based on three IPOs proxies—IPO volume, market turnover, and dividend premium—and proved that before the financial crisis, investor sentiment had a positive influence on Malaysian IPO firm performance, measured by *Tobin's Q*.

Generally, based on previous studies about the impact of sentiment on stock price and manager decisions, we propose our first hypothesis as follows:

H1. *Investor sentiment has a positive impact on firm value but a negative impact on firm profitability*

2.2. CSP and FP

Unlike the sentiment–FP relationship, the relationship between CSP and FP has been examined intensively from two different perspectives. The first is from the perspective of neoclassical economics and traditional management theories. They propose that companies should consider their shareholders as the primary stakeholders and allocate their resources to satisfy this group based on the assumption that profit maximization is a firm's key objective. Therefore, the efforts to satisfy other stakeholder groups would have a negative impact on firm performance. These theories have led to the long-held belief that there is a trade-off between CSP and FP. However, based on the stakeholder theory, other scholars have suggested that ESG is a tool to generate competitive advantage and improve FP. The debate between the two viewpoints has still been going on as the empirical results for the CSP–FP

relationship are ambiguous, inconclusive, or contradictory (Friede et al., 2015).

Minutolo et al. (2019) analyzed 467 firms in the S&P 500 from 2009 to 2015 and found that ESG positively affects *Tobin's Q* and *ROA*. Conversely, earlier, Velte (2017) examined the CSP–FP relationship of German companies, finding that ESG performance has a positive impact on *ROA* but no impact on *Tobin's Q*. In contrast to these studies, Duque-Grisales and Aguilera-Caracuel (2021) suggested that for Latin American emerging markets, the relationship between ESG score (both the overall and individual aspects) and *ROA* is significantly negative.

Han et al. (2016) used three individual ESG disclosure scores from Bloomberg as corporate social responsibility (CSR) measures and found divergent outcomes in the CSP–FP relationship in Korean companies. Specifically, the environmental performance has a negative (or U curve) impact, whereas the governance performance has a positive (or inverse U curve) impact on FP. However, they did not find any significant impact of social performance on FP.

Furthermore, Peng and Yang (2014) used a set of Taiwanese listed companies' unique pollution control data to measure CSP. They concluded that CSP does not affect short-run FP but positively affects long-run FP. Similarly, the evidence from the paper of Atan et al. (2018) for Malaysian firms suggested that ESG, both the individual and aggregate levels, has no significant effect on firm value (measured by *Tobin's Q*) and firm profitability (measured by *ROE*). Only the overall score of ESG has a significantly positive relationship with the weighted average cost of capital of a company.

Regarding the Japanese context, it is known that Japanese businesses have been built traditionally on long-term mutual benefit and support relationships. This stakeholder-oriented strategy was fundamentally in contrast to Western countries, where companies' primary goal was to generate profit for their shareholders. However, in a society where tipping or donating to charity has not always been a common practice, money and financial aid have often come from existing networks or close relationships. It used to be a strange idea that firms should share a portion of their profits with issues or people they are not connected with. Thus, along with a high level of government trust, many Japanese used to consider that the government was solely responsible for addressing matters relating to the environment, social welfare, and human rights.

Nowadays, although Japanese corporations' mindset of mutual benefit is a vital component for sustainable development, some changes should be made to allow them to efficiently adapt to the global market. The 2014 Stewardship Code and the Corporate Governance Code in 2015 have been major steps of the Japanese government to reform Japanese corporate governance and redirect Japanese firms' priorities toward their shareholders and the expectations of modern global investors. The purpose of these codes is to accomplish sustainable growth and increase value over the mid-to-long term. However, investments in reforming corporate governance, such as increasing the number of independent directors, hiring external auditors, providing more informative and extensive

disclosures, or taking measures to address environmental and social issues, are costly and thus can affect companies' performance in the short term (Duque-Grisales & Aguilera-Caracuel, 2021). Lopez et al. (2007) analyzed the relationship between accounting-based performance indicators, including the growth of profit before taxes, *ROA*, and *ROE* and CSR in European firms. They found that the relationship between these variables is negative, confirming that the effect of sustainability practices on performance indicators is negative in the first years in which they are applied. However, these sustainable investments might increase firm value via stock price, as Naughton et al. (2019) stated that investors consider companies with better social and environmental commitments a safer investment place. Therefore, we formulate the second hypothesis as follows:

H2. *CSP has a positive impact on firm value but a negative impact on firm profitability*

2.3. Moderating effect of investor sentiment on the CSP–FP relationship

As stated in the previous section, several studies have reported the sentiment effect on firm FP. Moreover, in recent times, researchers have also started to question the relationship between sentiment and CSR strategies. Cheong et al. (2017) were the first to investigate the potential role investors play in pressing firms to behave more responsibly. They suggested that if either financial markets or investors or both these stakeholder groups feel bearish in the preceding year, companies tend to improve their CSP in the following year to enhance their public image and gain confidence from market participants. Similarly, Naughton et al. (2019) confirmed that investor sentiment affects CSR commitments. They found evidence that companies enhance their CSP to react to investors' pessimism states. Particularly, this reaction is more noticeable among companies that are more motivated to react to investor sentiment due to valuation uncertainty and investor horizon.

Although the findings about the relationship of investor sentiment with CSP and FP are sparse, they make us doubt whether investor sentiment affects the CSP–FP relationship. Such sentiment impact might arise from managers' decisions to attract sentiment-driven investors. As stated in the study of Naughton et al. (2019), these decisions reflect a trade-off between two contradictory objectives. The first objective is to maximize a firm's long-term value by undertaking activities that can increase the risk-adjusted value of future cash flows. The second objective is to maximize the concurrent stock price by choosing activities that sentiment-driven investors prefer. Moreover, by stimulating investor sentiment, managers can provide a way to quickly raise the price of a company's stock, allowing them to earn more wages and reward or compensate for company losses (Jokar & Daneshi, 2020). Managers' decisions, either in a company's operating or social activities, can affect its CSP, FP, and their relationship. Therefore, we propose that the relationship between CSP and FP might be weakened under the sentiment influence as follows:

H3. Investor sentiment negatively moderates the CSP–FP relationship

3. Data and methodology

3.1. Sample

Our study covers all non-financial Japanese companies whose accounting and ESG information are accessible from Thomson Reuter Datastream and ASSET4 database. Following Velte (2017), we exclude financial sector firms as these firms have distinct corporate governance regulations and capital structures. The final sample includes data from 367 companies, with 5505 observations from 2005 to 2019.

3.2. Model design and variable definition

We utilize the following models to identify the effect of investor sentiment and CSR performance on FP:

$$FP_{i,t} = \alpha_i + \beta_1 MS_{t-1} + \beta_2 FS_{i,t-1} + \sum_{k=1}^5 \beta_3 CV_{k,i,t-1} + \varepsilon_{i,t-1} \quad (1)$$

$$FP_{i,t} = \alpha_i + \beta_1 ESG_{i,t-1} + \sum_{k=1}^5 \beta_3 CV_{k,i,t-1} + \varepsilon_{i,t-1} \quad (2a)$$

$$FP_{i,t} = \alpha_i + \beta_1 E_{i,t-1} + \beta_2 S_{i,t-1} + \beta_3 G_{i,t-1} + \sum_{k=1}^5 \beta_4 CV_{k,i,t-1} + \varepsilon_{i,t-1} \quad (2b)$$

Additionally, to detect the moderating role of investor sentiment on the CSP–FP relationship, we run two sentiment

indicators and the overall ESG score in the same regression equation, including the interaction terms between ESG and sentiment as follows:

$$FP_{i,t} = \alpha_i + \beta_1 ESG_{i,t-1} + \beta_2 MS_{t-1} + \beta_3 FS_{i,t-1} + \beta_4 ESG_{i,t-1} * MS_{t-1} + \beta_5 ESG_{i,t-1} * FS_{i,t-1} + \sum_{k=1}^5 \beta_6 CV_{k,i,t-1} + \varepsilon_{i,t-1} \quad (3)$$

where $FP_{i,t}$ denotes the FP of firm i at time t ; MS_{t-1} and $FS_{i,t-1}$ are market sentiment and firm-level sentiment at time $t-1$, respectively; $ESG_{i,t-1}$, $E_{i,t-1}$, $S_{i,t-1}$, and $G_{i,t-1}$ symbolize the overall CSP and its performance in each economic, social, and governance aspect at time $t-1$, respectively; $CV_{k,i,t-1}$ is a vector of control variables k for firm i at time $t-1$; $\varepsilon_{i,t-1}$ comprises an independent idiosyncratic error term $u_{i,t-1}$ and unobserved firm-specific characteristics $c_{i,t-1}$.

Based on contemporary literature, the debate on whether accounting- or market-based proxies are the best to capture firm FP has been going on among academics and practitioners. Therefore, in this study, we combine accounting-based (*ROA*) and market-based (*Tobin's Q*) variables to represent both the historical and potential future performance of companies (Atan et al., 2018). Furthermore, Choi and Wang (2009) argued that accounting-based measures are often affected by earning management decisions. Thus, adding market-based variables is essential. *ROA* is the most popular accounting indicator that has been used extensively in prior related studies, such as the studies of Duque-Grisales and Aguilera-Caracuel (2021), Guenster et al. (2011), and Ortas et al. (2015). *ROA* reflects how profitable a firm is in view of its total assets. However, consistent with the studies of McConnell et al. (2008), Theodoulidis et al. (2017), and Vieira et al. (2019), we employ

Table 1
Description of main variables.

Variables	Symbols	Description and calculation
<i>Panel A: Dependent variables</i>		
Tobin's Q	Tobin's Q	(Market value of equity + Preferred stock + Debt)/Total assets
Return on assets	ROA	Net profit/Total assets
<i>Panel B: Independent variables</i>		
Environmental performance	E	A weighted-average index of indicators in three categories: (i) resource use, (ii) emissions, and (iii) innovation
Social performance	S	A weighted-average index of indicators in four categories: (i) workforce, (ii) human rights, (iii) community, and (iv) product responsibility
Governance performance	G	A weighted-average index of indicators in three categories: (i) management, (ii) shareholders, and (iii) CSR strategy
Environmental, Social, and Governance performance	ESG	A combined index representing the overall performance in three individual pillars: environmental, social, and corporate governance
Market sentiment	MS	A composite index of consumer confidence index, volatility index, and advance/decline ratio
Firm-specific sentiment	FS	The previous six months' cumulative monthly stock returns
<i>Panel C: Control variables</i>		
Firm size	SIZE	Natural logarithm of total assets
Financial leverage	LEV	Total debt/Total assets
Market-to-book ratio	MTB	The market value of equity/Book value of equity
Board structure	IND	The percentage of independent board members
Gross domestic product	GDP	The growth rate of gross domestic product

The table provides brief definitions of the main variables used in the study.

Table 2
Descriptive statistics.

	Obs.	Mean	SD	Min	Max
Tobin's Q	5369	0.968	0.794	0.158	6.035
ROA	5386	4.292	4.398	-10.240	21.410
MS	5505	~0	0.615	-0.982	1.279
FS	5376	~0	0.290	-1.103	1.591
E	5072	42.740	29.463	0.000	93.490
S	5072	33.276	23.306	0.220	85.890
G	5072	48.162	23.169	5.530	93.200
ESG	5072	41.184	20.905	3.510	83.710
SIZE	5413	20.405	1.173	17.266	23.480
LEV	5407	22.184	17.872	0.000	67.930
MTB	5371	1.941	1.814	0.407	13.718
IND	4070	17.863	15.764	0.000	68.750
GDP	5505	0.436	2.193	-5.978	3.415

The table presents the statistical description of the main used variables. The sample covers data from 367 non-financial Japanese corporates over the period between 2005 and 2019. The variables' details are described in Table 1.

Tobin's Q as a forward-looking measure of firm performance. Tobin's Q, which is computed using Chung and Pruitt's (1994) approximation, is defined as the ratio of a firm's market value to its physical asset.

The independent variables are divided into two groups. The first one captures investor sentiment, and the other evaluates CSP. Regarding investor sentiment, our study considers both firm-specific and market sentiment. The firm-level sentiment is the companies' previous six-month cumulative stock returns (Polk & Sapienza, 2008). Market sentiment, on the other hand, is a composite index constructed from three indicators—consumer confidence index (CCI), volatility index (VIX), and advance/decline ratio (ADR). Earlier studies, such as those of Brown and Cliff (2004), Gunathilaka et al. (2017), and Smales (2017), have verified that CCI, VIX, and ADR capture some elements of market sentiment. However, as there is a possibility that these proxies still contain

idiosyncratic components that do not relate to investor behavior, we utilize principal component analysis (PCA) to extract sentiment components from these proxies. To begin with, we estimate the first principal component of CCI_t , VIX_t , and ADR_t , and their one-year lag, i.e., CCI_{t-1} , VIX_{t-1} , and ADR_{t-1} , to create the first-stage index. The lags are included to capture the potential late response of some sentiment indicators (Corredor et al., 2013). By comparing the correlations between each indicator and its lag with the first-stage index, the three loadings with the highest coefficients are used. PCA is then applied again for these loadings to achieve a raw market sentiment index. Eventually, following the study of Seok et al. (2019), to pull out the macroeconomic components of our indices, we orthogonalize both market and firm-level sentiment on the growth rates of gross domestic product (GDP), inflation rate, unemployment rate, and industrial production index. The residuals from these regressions, denoted as FS and MS, are used as investor sentiment variables in subsequent analyses.

We obtain ESG scores from the ASSET4 database as the quantification for CSP. ASSET4 is one of the most well-known and diverse databases for ESG information. The ESG series on this platform have been employed abundantly in previous studies about CSR activities (Garcia et al., 2017; Ioannou & Serafeim, 2012; Rajesh, 2020; Shakil et al., 2019). According to the Thomson Reuters ESG Scores report (2017), ESG series are calculated from publicly available information, including annual reports, the websites of companies and non-governmental organizations, stock exchange filings, CSR reports, and news sources. They are then classified into ten categories under the environmental, social, and governance pillars. The environmental pillar measures firm performance in using resources, reducing emissions, and making innovations. The social pillar measures a firm's dedication to solving issues related to its workforce and products as well as human rights and community. Finally, the governance pillar measures firm

Table 3
Correlation matrix.

	Tobin's Q	ROA	MS	FS	E	S	G	ESG	SIZE	LEV	MTB	IND	GDP
Tobin's Q	1.00												
ROA	0.65***	1.00											
MS	0.10***	0.03**	1.00										
FS	-0.07***	-0.08***	0.21***	1.00									
E	-0.18***	-0.17***	-0.12***	0.01	1.00								
S	-0.07***	-0.07***	-0.12***	0.00	0.73***	1.00							
G	0.04***	0.06***	-0.01	0.01	0.39***	0.49***	1.00						
ESG	-0.07***	-0.06***	-0.11***	0.01	0.86***	0.90***	0.70***	1.00					
SIZE	-0.35***	-0.29***	-0.03**	0.00	0.48***	0.43***	0.29***	0.48***	1.00				
LEV	-0.19***	-0.43***	-0.01	0.05***	0.14***	0.05***	-0.06***	0.06***	0.42***	1.00			
MTB	0.83***	0.53***	0.18***	0.12***	-0.17***	-0.06***	0.05***	-0.07***	-0.32***	-0.15***	1.00		
IND	0.10***	0.11***	-0.08***	0.00	0.18***	0.34***	0.35***	0.35***	0.08***	-0.11***	0.09***	1.00	
GDP	0.06***	0.10***	0.00	0.00	0.04***	0.05***	0.01	0.04***	0.06***	-0.04***	0.08***	0.14***	1.00

The table displays the correlation matrix for the used variables. The sample covers data from 367 non-financial Japanese corporates over the period between 2005 and 2019. The variables' details are described in Table 1.

*, **, and *** indicate significance at 10%, 5%, and 1% confidence levels, respectively.

effectiveness in corporate management, shareholders' relationship, and CSR strategy. The aggregate ESG score is a weighted average index of the three categories. The index takes values from 0 to 100, with higher values indicating higher ESG performance. We retrieve both the overall score and the scores of each of the three individual pillars. These variables allow us to examine not only the total impact but also the sub-effect of each ESG aspect and detect the aspect with the dominant impact on a firm's FP.

We introduce several prevalent control variables that can influence firm performance in our estimated models. Because Minutolo et al. (2019) and Rountree et al. (2008) stated that firm profitability is related to firm value, in models in which *Tobin's Q* is the response variable, in addition to firm size (*SIZE*), debt ratio (*LEV*), board structure (*IND*), and *GDP*, we also use *ROA* as one of the control variables. However, when *ROA* is employed as the FP proxy, the set of control variables comprises *SIZE*, *LEV*, *IND*, *GDP*, and market-to-book ratio (*MTB*), following Peng and Yang (2014).

The details of all dependent, independent, and control variables employed in this study are summarized in Table 1. Following the usual practice in financial studies, we winsorize all variables at the 1st and 99th percentile to minimize the potential impact of outliers. After that, the variance inflation factor (VIF) is calculated for all explanatory and control variables. No VIF exceeds 3, signifying that our models are not affected by the multicollinearity problem. Furthermore,

following earlier studies, such as Aouadi and Marsat (2018) and Saleh et al. (2011), we lag all right-hand-side variables one period to neutralize the possibility of reverse causality. The time effects are also considered by inserting year dummies into our regressions.

In the end, for each model, we perform three panel approaches—pooled ordinary least square (POLS), random effects (RE), and fixed effects (FE)—with firm-cluster standard errors. RE models are estimated under the assumption that $c_{i,t-1}$ changes across time. However, when $c_{i,t-1}$ is time-invariant, FE estimations are applied. The simple POLS regressions are also employed as a robustness check. We detect the most suitable estimation based on the results of the F-test, Breusch–Pagan test, and Hausman test.

4. Results

The panel diagnostics, involving F-test, Breusch–Pagan test, and Hausman test, reveal that for our data, FE regressions are preferred over POLS and RE regressions. Therefore, we analyze and discuss the results using FE estimations.

4.1. Descriptive statistics and correlation matrix

Tables 2 and 3 present the key statistics and Pearson correlation matrix of the main variables utilized in this study, respectively.

Table 4
Impact of sentiment on corporate FP.

	Tobin's Q			ROA		
	POLS	RE	FE	POLS	RE	FE
	(1a)	(1b)	(1c)	(2a)	(2b)	(2c)
MS	0.982*** (4.76)	0.713*** (4.15)	0.615*** (2.91)	-0.774*** (-4.51)	-0.661*** (-4.80)	-0.864*** (-4.45)
FS	0.039*** (2.65)	0.036*** (3.33)	0.034*** (3.07)	0.047*** (2.87)	0.051*** (3.64)	0.048*** (3.33)
SIZE	-0.216*** (-5.99)	-0.322*** (-4.18)	-0.404* (-1.67)	-0.019 (-0.60)	-0.093** (-2.52)	-0.488*** (-2.97)
LEV	0.184*** (6.36)	0.067 (1.31)	0.026 (0.33)	-0.307*** (-10.56)	-0.312*** (-9.56)	-0.307*** (-5.61)
ROA	0.543*** (9.51)	0.239*** (7.86)	0.184*** (6.37)			
MTB				0.619*** (13.96)	0.543*** (12.81)	0.493*** (9.80)
IND	0.062* (1.95)	0.013 (0.58)	0.001 (0.06)	-0.014 (-0.48)	0.011 (0.56)	0.027 (1.19)
GDP	1.250*** (5.14)	0.896*** (4.36)	0.775*** (3.02)	-1.029*** (-4.90)	-0.878*** (-5.04)	-1.111*** (-4.54)
CONST.	-0.887*** (-5.59)	-0.634*** (-4.98)	-0.359* (-1.79)	0.864*** (5.96)	0.761*** (6.35)	0.907*** (4.87)
Obs.	3775	3775	3775	3783	3783	3783
Year FE	Yes	Yes	Yes	Yes	Yes	Yes
Industry FE	Yes	Yes	No	Yes	Yes	No
R ²	0.4519	0.2246	0.2285	0.4882	0.2986	0.3054
F-stat.	14.91***	367.28***	17.05***	34.62***	970.76***	25.34***

The table presents the regression results between investor sentiment and two FP indicators, namely *Tobin's Q* and *ROA*. Firm-clustered t-statistics are in parentheses. The sample covers data from 367 non-financial Japanese corporates over the period between 2005 and 2019. The variables' details are described in Table 1. FE is efficient over POLS and RE.

*, **, and *** indicate significance at 10%, 5%, and 1% confidence levels, respectively.

As presented in Table 2, from 2005 to 2019, the average of *Tobin's Q* is approximately 1 with a small standard deviation of 0.794. *ROA* gets minimum and maximum values of -10.240% and 21.410% , respectively, as well as a mean and a considerable deviation of 4.292% and 4.398 , respectively. Market and firm-specific sentiment exhibit similar outcomes, with nearly zero average and insignificant variation. Regarding CSP, the scores of the three ESG pillars vary from 0 to 93.490, with social performance and governance performance having the lowest mean at 33.276 and the highest mean at 48.162, respectively. Overall, with an average ESG score of 41.184, Japanese firms have a weak achievement in CSR activities. Finally, among the control variables, *LEV* has the highest mean and standard deviation of 22.184% and 17.872 , respectively.

The bivariate correlation coefficients in Table 3, which are significant at least at the 5% level, indicate the unique relationship between investor sentiment, ESG scores, and FP. Most of the independent variables have a negative correlation to *Tobin's Q* and *ROA*, except for market sentiment and governance factors. The results provide general ideas about the concurrent relationships among the studied variables, which will be investigated thoroughly in the next section. Moreover, the correlation coefficients between the explanatory and control

variables are all under 0.8, confirming the outcomes of VIFs that there is no severe collinearity concern in our multivariate estimations.

4.2. Sentiment and FP

Table 4 reports the estimation results about the influence of investor sentiment on future FP. As demonstrated in the table, sentiment and *Tobin's Q* have a positive relationship as the coefficients of *MS* and *FS* are 0.615 and 0.034, respectively, with a 1% significance level. It means that investors' bullish outlook toward a company and the entire market in the preceding year can enhance firm value in the following year. Our finding is in tandem with the theory that when the economy is in expansion and potential investors are optimistic about the future of a company, they tend to overvalue its stock value. Thus, the firm's stock price rises, increasing its market value and affecting other investors' behavior in the financial markets, which in turn can boost the price rise more.

Regarding firm profitability, the impact of firm-specific sentiment on *ROA* is similar to that of *Tobin's Q*. In contrast, the estimated coefficient of *MS* in *ROA*'s FE regression is -0.864 (t-stat. = -4.45), indicating a negative relationship between market sentiment and *ROA*. Thus, we suggest that

Table 5
Impact of ESG performance on *Tobin's Q*.

	POLS		RE		FE	
	(1a)	(1b)	(2a)	(2b)	(3a)	(3b)
ESG	0.070** (2.45)		0.075** (2.47)		0.064* (1.88)	
E		-0.029 (-1.01)		0.002 (0.08)		0.022 (0.63)
S		0.063** (2.04)		0.057** (2.12)		0.051* (1.78)
G		0.050* (1.71)		0.029 (1.20)		0.014 (0.53)
SIZE	-0.255*** (-5.96)	-0.252*** (-5.86)	-0.363*** (-4.41)	-0.363*** (4.34)	-0.441* (-1.85)	-0.443* (-1.85)
LEV	0.195*** (6.32)	0.193*** (6.18)	0.074 (1.48)	0.075 (1.51)	0.029 (0.37)	0.028 (0.37)
ROA	0.541*** (9.49)	0.536*** (9.41)	0.238*** (7.88)	0.237*** (7.81)	0.181*** (6.31)	0.181*** (6.28)
IND	0.043 (1.24)	0.031 (0.83)	0.004 (0.19)	0.003 (0.14)	-0.003 (-0.14)	-0.002 (-0.07)
GDP	2.876*** (5.42)	2.671*** (4.52)	2.287*** (4.80)	2.282*** (4.45)	2.011*** (3.49)	2.134*** (3.85)
CONST.	0.070 (0.85)	0.074 (0.89)	0.069 (0.84)	0.076 (0.92)	0.264*** (6.76)	0.268*** (6.67)
Obs.	3779	3779	3779	3779	3779	3779
Year FE	Yes	Yes	Yes	Yes	Yes	Yes
Industry FE	Yes	Yes	Yes	Yes	No	No
R ²	0.4541	0.4556	0.2224	0.2231	0.2265	0.2274
F-stat.	15.16***	14.83***	356.37***	373.32***	15.94***	14.63***

The table presents the regression results between CSP and *Tobin's Q*. Firm-clustered t-statistics are in parentheses. The sample covers data from 367 non-financial Japanese corporates over the period between 2005 and 2019. The variables' details are described in Table 1. FE is efficient over POLS and RE.

*, **, and *** indicate significance at 10%, 5%, and 1% confidence levels, respectively.

participants' pessimism in financial markets might play a driving role for companies to increase their subsequent operating performance as low sentiment can enhance the positive impact of corporate investments on firm performance (McLean & Zhao, 2014).

In general, our evidence claims that investor sentiment has a significant effect on firm FP, with market sentiment being the superior one. Furthermore, compared with using *Tobin's Q*, when *ROA* is used as a performance proxy, the relationship between sentiment and FP seems to be slightly stronger. We find that sentiment positively influences firm value but negatively influences firm operating performance, confirming our first hypothesis. These results are similar to those of Yi and Xiugang (2018). They proved that Chinese investors' irrational sentiment not only leads to volatility in abnormal stock prices (measured by *Tobin's Q*) but also increases firms' inefficient investment indirectly, which decreases the effective allocation of social resources and has negative effects on the healthful growth of the Chinese economy.

4.3. ESG scores and FP

4.3.1. ESG scores and *Tobin's Q*

Table 5 indicates a positive effect of both the total and the three individual ESG pillars on firm value, represented by

Tobin's Q. A 1% improvement in ESG performance results in a 0.064% increase in firm value and vice versa. Among the three ESG pillars, the impact of social performance on *Tobin's Q* is dominant as its coefficient is the highest and is only the statistically significant one (coef. = 0.051; t-stat. = 1.78). Our results support the conflict resolution theory, which assumes that high CSR activities can lead to high firm value by mitigating conflicts of interest between managers and non-investing stakeholders, improving firm reputation, and enhancing firm profitability (Buchanan et al., 2018). Thus, we suggest that for Japanese companies, refining CSR strategies and improving their relationship with their stakeholders can be one of the ways to uplift their future market value.

4.3.2. ESG scores and *ROA*

The relationship of ESG performance with *ROA*, which symbolizes firm profitability, contrasts with those observed in the ESG–firm value relationship, as depicted in Table 6. Specifically, the evidence indicates that excelling in CSP leads to worse operating performance for companies, with the coefficient of *ESG* being -0.103 (t-stat = -3.20). Moreover, the estimation results of Model (3b) reveal a similar influence of the three individual ESG pillars on firm profitability. However, only the environmental effect is statistically significant (coef. = -0.079 ; t-stat. = -2.15). Therefore, we

Table 6
Impact of ESG performance on *ROA*.

	POLS		RE		FE	
	(1a)	(1b)	(2a)	(2b)	(3a)	(3b)
ESG	-0.026 (-1.00)		-0.058** (-2.47)		-0.103*** (-3.20)	
E		-0.068** (-2.30)		-0.066** (-2.37)		-0.079** (-2.15)
S		-0.009 (-0.32)		-0.009 (-0.31)		-0.024 (-0.73)
G		0.045* (1.90)		-0.009 (-0.44)		-0.035 (-1.54)
SIZE	-0.003 (-0.09)	0.004 (0.11)	-0.063 (-1.63)	-0.054 (-1.40)	-0.510*** (-3.06)	-0.505*** (-3.03)
LEV	-0.308*** (-10.26)	-0.306*** (-10.44)	-0.313*** (-9.38)	-0.313*** (-9.44)	-0.301*** (-5.45)	-0.300*** (-5.38)
MTB	0.623*** (14.01)	0.616*** (13.84)	0.556*** (13.25)	0.555*** (13.28)	0.507*** (10.29)	0.508*** (10.34)
IND	-0.007 (-0.22)	-0.023 (-0.68)	0.021 (1.00)	0.018 (0.85)	0.039* (1.68)	0.039* (1.67)
GDP	-1.896*** (-4.44)	-2.283*** (-5.03)	-1.717*** (-4.93)	-1.804*** (-4.98)	-2.595*** (-4.81)	-2.614*** (-4.61)
CONST.	0.129** (2.11)	0.124** (1.99)	0.140** (2.39)	0.147** (2.45)	0.059* (1.70)	0.057 (1.60)
Obs.	3787	3787	3787	3787	3787	3787
Year FE	Yes	Yes	Yes	Yes	Yes	Yes
Industry FE	Yes	Yes	Yes	Yes	No	No
R ²	0.4869	0.4904	0.2955	0.2960	0.3048	0.3055
F-stat.	35.85***	34.94***	934.54***	1003.15***	23.97***	23.40***

The table presents the regression results between CSP and *ROA*. Firm-clustered t-statistics are in parentheses. The sample covers data from 367 non-financial Japanese corporates over the period between 2005 and 2019. The variables' details are described in Table 1.

FE is efficient over POLS and RE.

*, **, and *** indicate significance at 10%, 5%, and 1% confidence levels, respectively.

claim that Japanese firms with high ESG scores tend to be less profitable, supporting the findings of [Duque-Grisales and Aguilera-Caracuel \(2021\)](#). The authors explained that when firms invest more in CSR activities, they may have to sacrifice their cash flow and divert their operation resources, thereby deteriorating their performance.

Overall, regarding the CSP–FP relationship, the results confirm our second hypothesis that CSP has a positive impact on firm value but a negative impact on firm profitability. This conclusion verifies the result of [Fabozzi et al. \(2021\)](#), who also detected the same influence of ESG on the FP of Japanese companies using a different proxy for ESG performance.

4.4. Moderating effect of investor sentiment on the ESG–FP relationship

[Table 7](#) presents the estimation results of Equation (3), considering the moderating impact of *MS* and *FS* on the relationship between CSP and FP. As presented in the table, the ESG–FP relationship is moderated by investor sentiment, especially the market-level one. In detail, the coefficients of the interaction variables between market sentiment and ESG

performance are opposite to those of ESG performance (coef. = -0.027 and t-stat. = -2.03 for *Tobin's Q's* FE regression, whereas coef. = 0.036 and t-stat. = 2.70 for *ROA's* FE regression), indicating a negative influence of market sentiment on the ESG–FP relationship. However, the moderating impact of firm-specific sentiment is weak and insignificant.

In summary, the outcomes imply that the presence of investor sentiment can erode the relationship between CSR and FP, supporting our third hypothesis. It is proved that market participants' outlook diminishes the negative impact of ESG performance on firm profitability, allowing companies to achieve the benefits of their CSR strategies while not manipulating their operating performance. However, the side effect is that investor mood also alleviates the boosting force of ESG performance on firm value.

4.5. Robustness tests

4.5.1. Alternative measures of FP

The first sensitive test is conducted to determine whether our findings still hold despite using different FP proxies. As

Table 7
Impact of sentiment on the ESG–FP relationship.

	Tobin's Q			ROA		
	POLS	RE	FE	POLS	RE	FE
	(1a)	(1b)	(1c)	(2a)	(2b)	(2c)
ESG	0.069** (2.39)	0.075** (2.47)	0.066* (1.96)	-0.026 (-1.00)	-0.057** (-2.44)	-0.100*** (-3.13)
MS	0.970*** (4.77)	0.768*** (4.34)	0.701*** (3.24)	-0.743*** (-4.40)	-0.681*** (-5.04)	-0.991*** (-4.88)
FS	0.040*** (2.69)	0.038*** (3.32)	0.037*** (3.12)	0.041*** (2.62)	0.046*** (3.54)	0.040*** (3.04)
ESG*MS	-0.026* (-1.82)	-0.028** (-2.27)	-0.027** (-2.03)	0.032** (2.04)	0.029** (2.05)	0.036*** (2.70)
ESG*FS	-0.007 (-0.49)	-0.001 (-0.12)	-0.002 (-0.19)	0.024 (1.34)	0.022 (1.36)	0.020 (1.26)
SIZE	-0.255*** (-5.95)	-0.352*** (-4.26)	-0.394 (-1.61)	-0.003 (-0.09)	-0.063 (-1.93)	-0.497*** (-3.05)
LEV	0.194*** (6.25)	0.072 (1.45)	0.026 (0.33)	-0.310*** (-10.34)	-0.317*** (-9.52)	-0.307*** (-5.59)
ROA	0.544*** (9.55)	0.241*** (7.91)	0.184*** (6.37)			
MTB				0.622*** (13.94)	0.548*** (12.92)	0.498*** (9.90)
IND	0.042 (1.24)	0.003 (0.12)	-0.006 (-0.24)	-0.007 (-0.22)	0.020 (0.99)	0.037* (1.66)
GDP	1.232*** (5.17)	0.955*** (4.54)	0.869*** (3.35)	-0.981*** (-4.76)	-0.895*** (-5.22)	-1.254*** (-4.88)
CONST.	-0.898*** (-5.64)	-0.699*** (-5.24)	-0.437** (-2.17)	0.845*** (5.89)	0.794*** (6.61)	1.025*** (5.24)
Obs.	3775	3775	3775	3783	3783	3783
Year FE	Yes	Yes	Yes	Yes	Yes	Yes
Industry FE	Yes	Yes	No	Yes	Yes	No
R ²	0.4562	0.2295	0.2330	0.4903	0.3033	0.3120
F-stat.	14.74***	382.71***	15.38***	33.59***	978.58***	22.90***

The table presents the regression results between investor sentiment, ESG scores, and FP indicators. Firm-clustered t-statistics are in parentheses. The sample covers data from 367 non-financial Japanese corporates over the period between 2005 and 2019. The variables' details are described in [Table 1](#). FE is efficient over POLS and RE.

*, **, and *** indicate significance at 10%, 5%, and 1% confidence levels, respectively.

used in the previous analyses, we apply two firm FP measurements, i.e., *Tobin's Q* and *ROA*. Following the studies of Han et al. (2016) and Peng and Yang (2014), we replace *Tobin's Q* and *ROA* with *MTB* and *ROE* in our regression equations, respectively. *MTB* is the ratio between market and book value of equity, while *ROE* is calculated by dividing a firm's net profit by its shareholders' equity. Table 8 reports the empirical results of models in which *MTB* and *ROE* are the dependent variables, whereas the independent and control variables remain unchanged. As FE is suggested as the preferred model for our data, we only present the results of FE estimations.

As demonstrated in the table, with indifferent coefficients and most of them being statistically significant, the relationships between sentiment, ESG scores, and corporate FP remain the same even after using other FP indicators. The only

exception is that the moderating impact of market sentiment on the CSP–firm value relationship is statistically insignificant when *MTB* replaces *Tobin's Q*.

4.5.2. Alternative measure of market sentiment

As our market sentiment index is constructed based on the PCA method and the estimation values of a composite index formed by PCA might be different from a single index (Seok et al., 2019), others might doubt the validity of our results. Therefore, we rerun our models using *CCI* as the proxy of market sentiment. The results of FE regressions for *Tobin's Q* and *ROA* and two alternative measures—*MTB* and *ROE*—are presented in Table 9. The estimated coefficients of the explanatory variables in this table verify the validity of our composite market sentiment index, as the main conclusions are intact.

Table 8
Using *MTB* and *ROE* as FP indicators.

	MTB				ROE			
	(1a)	(1b)	(1c)	(1d)	(2a)	(2b)	(2c)	(2d)
ESG	0.065* (1.93)			0.066** (1.99)	−0.099** (−2.43)			−0.096** (−2.37)
E		0.031 (0.85)				−0.040 (−0.75)		
S		0.059** (2.18)				−0.044 (−1.11)		
G		0.008 (0.33)				−0.045 (−1.57)		
MS			0.320 (1.54)	0.404* (1.94)			−0.831*** (−3.88)	−0.945*** (−4.16)
FS			0.023* (1.85)	0.028** (2.17)			0.059*** (3.67)	0.050*** (3.24)
ESG*MS				−0.017 (−1.46)				0.045*** (2.63)
ESG*FS				−0.014 (−1.27)				0.025 (1.52)
SIZE	−0.808*** (−3.49)	−0.811*** (−3.52)	−0.784*** (−3.33)	−0.779*** (−3.28)	−0.681*** (−3.60)	−0.678*** (−3.58)	−0.650*** (−3.49)	−0.665*** (−3.57)
LEV	0.186*** (2.67)	0.185*** (2.70)	0.184*** (2.60)	0.184*** (2.62)	−0.025 (−0.40)	−0.027 (−0.43)	−0.033*** (−0.52)	−0.032 (−0.52)
ROA	0.089*** (3.83)	0.089*** (3.80)	0.091*** (3.87)	0.091*** (3.90)				
MTB					0.579*** (10.39)	0.580*** (10.46)	0.561*** (10.04)	0.567*** (10.38)
IND	−0.029* (−1.15)	−0.027 (−1.04)	−0.025 (−1.03)	−0.032 (−1.26)	0.083** (2.53)	0.085** (2.56)	0.071** (2.16)	0.081** (2.49)
GDP	0.974* (1.73)	1.192** (2.21)	0.169 (0.66)	0.266 (1.04)	−2.490*** (−4.05)	−2.451*** (−3.84)	−1.100*** (−4.02)	−1.224*** (−4.21)
CONST.	0.258*** (6.06)	0.266*** (6.08)	−0.070 (−0.34)	−0.151 (−0.75)	0.071* (1.79)	0.073* (1.78)	0.883*** (4.23)	0.990*** (4.49)
Obs.	3780	3780	3775	3775	3787	3787	3783	3783
Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
R ²	0.2193	0.2212	0.2200	0.2243	0.2403	0.2407	0.2423	0.2482
F-stat.	26.54***	24.94***	26.88***	23.76***	14.55***	13.37***	15.01***	14.25***

The table presents the results for the panel FE regressions between sentiment, ESG scores, and FP indicators when *Tobin's Q* and *ROA* are replaced by *MTB* and *ROE*, in turn. Firm-clustered t-statistics are in parentheses. The sample covers data from 367 non-financial Japanese corporates over the period between 2005 and 2019. The variables' details are described in Table 1.

*, **, and *** indicate significance at 10%, 5%, and 1% confidence levels, respectively.

4.5.3. Instrumental variable regressions

It is widely known that endogeneity arising from omitted variable bias, reverse causality, selection bias, or measurement errors is a critical issue when using panel regression models. Although our estimations, which use lagged explanation variables and FE, can diminish several endogeneity concerns, such as reserve causality and omitted firm-level heterogeneity, there is a possibility that such problems would affect our results. Hence, we employ the instrumental variable (IV) regressions to alleviate any remaining endogeneity issues. The general idea of the IV approach is to identify a variable (known as an instrument) that affects the explanatory variable but is unlikely to affect the dependent variable, except through its influence on the explanatory variable. This IV is then used to extract the endogenous component from the explanatory variable that causes bias in ordinary least square estimations. Then, the independent variable becomes exogenous, i.e., uncorrelated with the error term, and can be utilized more efficiently in estimated models. Therefore, IV is a common and useful method for handling endogeneity problems (Bascle, 2008; Reeb et al., 2012).

Our IV regression procedure is as follows. First, we calculate the industry-year mean of the overall ESG score and firm-specific sentiment, denoted as *A.ESG* and *A.FS*, respectively. *A.ESG* and *A.FS* are selected as an instrument for *ESG* and *FS*, respectively, following related studies by Aouadi and Marsat (2018), El Ghoul et al. (2011), and Kim et al. (2014). Next, in the first stage, we regress *ESG* and *FS* on its instrument as well as other independent and control variables. Finally, the fitted values from the first-stage regressions—*P.ESG* and *P.FS*—substitute *ESG* and *FS*, respectively, in the second-stage models to investigate the relationship between sentiment, CSP, and FP. The results of both firm RE and firm FE are presented in Table 10.

It is clear from the table that both RE and FE estimations have the same pattern. Although the magnitude of the coefficients is much higher than that of the three panel regressions in our previous analyses, ESG performance and market sentiment still influence *Tobin's Q* positively and *ROA* negatively. Furthermore, the moderating role of sentiment in mitigating the ESG–FP relationship still holds. The only inconsistency is that

Table 9
Using *CCI* as a market sentiment indicator.

	TQ		MTB		ROA		ROE	
	(1a)	(1b)	(2a)	(2b)	(3a)	(3b)	(4a)	(4b)
ESG		0.063* (1.89)		0.064* (1.94)		-0.096*** (-3.00)		-0.090** (-2.25)
CCI	0.362*** (2.91)	0.411*** (3.24)	0.188 (1.54)	0.237* (1.94)	-0.508*** (-4.45)	-0.582*** (-4.89)	-0.488*** (-3.88)	-0.555*** (-4.15)
FS	0.034*** (3.07)	0.037*** (3.08)	0.023* (1.85)	0.027** (2.15)	0.048*** (3.33)	0.040*** (3.13)	0.059*** (3.67)	0.051*** (3.34)
ESG*CCI		-0.031** (-2.17)		-0.021* (-1.70)		0.042*** (3.40)		0.052*** (3.07)
ESG*FS		-0.001 (-0.07)		-0.013 (-1.18)		0.019 (1.21)		0.024 (1.40)
SIZE	-0.404* (-1.67)	-0.391 (-1.60)	-0.784*** (-3.33)	-0.777*** (-3.28)	-0.488*** (-2.97)	-0.450*** (-3.07)	-0.650*** (-3.49)	-0.668*** (-3.60)
LEV	0.026 (0.33)	0.027*** (0.34)	0.184*** (2.60)	0.185*** (2.64)	-0.307*** (-5.61)	-0.308*** (-5.62)	-0.033 (-0.52)	-0.033 (-0.54)
ROA	0.184*** (6.37)	0.183*** (6.37)	0.091*** (3.87)	0.091*** (3.89)				
MTB					0.493*** (9.80)	0.499*** (9.91)	0.561*** (10.04)	0.568*** (10.45)
IND	0.001 (0.06)	-0.006 (-0.25)	-0.025 (-1.03)	-0.032 (-1.27)	0.027 (1.19)	0.038* (1.66)	0.071** (2.16)	0.081** (2.49)
GDP	0.219*** (3.16)	0.241*** (3.49)	-0.120 (-1.62)	-0.096 (-1.32)	-0.330*** (-4.35)	-0.365*** (-4.60)	-0.349*** (-3.97)	-0.379*** (-4.07)
CONST.	-0.113 (-0.95)	-0.158 (-1.34)	0.057 (0.46)	0.010 (0.08)	0.562*** (5.06)	0.631*** (5.41)	0.552*** (4.37)	0.615*** (4.64)
Obs.	3775	3775	3775	3775	3783	3783	3783	3783
Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
R ²	0.2285	0.2338	0.2200	0.2247	0.3054	0.3126	0.2423	0.2489
F-stat.	17.05***	15.62***	26.88***	23.65***	25.34***	23.38***	15.01***	14.68***

The table presents the results for the panel FE regressions between sentiment, ESG scores, and FP indicators when *CCI* replaces market sentiment. Firm-clustered t-statistics are in parentheses. The sample covers data from 367 non-financial Japanese corporates over the period between 2005 and 2019. The variables' details are described in Table 1.

*, **, and *** indicate significance at 10%, 5%, and 1% confidence levels, respectively.

Table 10
Instrumental variable estimations.

	RE				FE			
	First stage		Second stage		First stage		Second stage	
	ESG	FS	TQ	ROA	ESG	FS	TQ	ROA
ESG		0.015 (1.07)				-0.075** (-2.18)		
A.ESG	0.675*** (5.29)				0.696*** (5.42)			
P.ESG			2.760*** (6.68)	-1.457*** (-5.56)			1.687*** (5.38)	-0.792*** (-3.37)
MS	-0.086 (-0.76)	0.006 (3.24)	3.472*** (6.91)	-1.960*** (-5.39)	-0.183 (-1.58)	-0.274*** (-3.44)	2.662*** (5.83)	-1.567*** (-3.86)
FS	-0.008 (-1.17)				-0.013* (-1.95)			
A.FS		0.995*** (17.01)				0.962*** (16.60)		
P.FS			0.262*** (6.75)	-0.211*** (-5.28)			0.393*** (6.49)	-0.124*** (-3.58)
P.ESG*MS			-0.109*** (-4.08)	0.118*** (3.16)			-0.013 (-0.18)	0.212** (2.44)
P.ESG*P.FS			-0.049 (-1.16)	0.052 (1.06)			-0.109 (-0.89)	0.015 (0.19)
SIZE	0.380*** (8.34)	0.013 (0.72)	-1.279*** (-7.37)	0.515*** (4.97)	0.115 (1.37)	-0.431*** (-3.32)	-0.260 (-1.29)	-0.504*** (-2.82)
LEV	-0.056* (-1.68)	0.007 (0.36)	0.215*** (6.12)	-0.363*** (-11.70)	-0.019 (-0.53)	0.038 (0.73)	0.004 (0.06)	-0.290*** (-5.25)
ROA	-0.020 (-1.50)	-0.115*** (-4.62)	0.326*** (10.31)		-0.013 (-0.99)	-0.120*** (-3.41)	0.217*** (8.08)	
MTB	0.066*** (3.74)	0.129*** (4.29)		0.687*** (17.57)	0.053*** (2.85)	0.275*** (6.21)		0.565*** (10.88)
IND	0.109*** (4.76)	-0.003 (-0.22)	-0.302*** (-5.71)	0.165*** (4.57)	0.095*** (4.11)	0.017 (0.71)	-0.181*** (-4.69)	0.117*** (3.61)
GDP	-0.371 (-0.73)	-0.004 (-0.01)	4.130*** (6.73)	-2.262*** (-5.07)	-0.809 (-1.56)	-1.324*** (-3.14)	3.006*** (5.34)	-1.768*** (-3.52)
CONST.	0.161 (1.10)	0.041 (0.61)	-3.775*** (-7.29)	2.319*** (6.17)	0.144 (1.53)	0.288*** (3.70)	-2.369*** (-5.60)	1.593*** (4.31)
Obs.	4042	4042	3775	3775	4042	4042	3775	3775
Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Industry FE	Yes	Yes	Yes	Yes	No	No	No	No
R ²	0.3249	0.3358	0.3254	0.2989	0.3313	0.3479	0.3413	0.3105
F-stat.	638.80***	1616.55***	515.88***	1140.93***	24.92***	68.39***	16.38***	21.53***

The table presents the results for the IV estimations between investor sentiment, ESG score, and FP indicators. *ESG* and *FS* are regressed on average industry-year variables, i.e., *A.ESG* and *A.FS*, and other exogenous independent variables in the first stage. The second stage employs predicted *ESG* and *FS* values (*P.ESG* and *P.FS*) extracted from the first-stage estimations to get regression results. Firm-clustered t-statistics are in parentheses. The sample covers data from 367 non-financial Japanese corporates over the period between 2005 and 2019. The variables' details are described in Table 1.

*, **, and *** indicate significance at 10%, 5%, and 1% confidence levels, respectively.

the relationship between firm-specific sentiment and *ROA* changes from positive to negative.

5. Conclusion

This study focuses on the relationship between investor sentiment, CSR, and FP of 367 non-financial Japanese firms from 2005 to 2019. First, we find a significant impact of investor sentiment on subsequent FP, both at firm and market levels. Specifically, firm-specific sentiment, which is calculated as the cumulative monthly stock returns of the previous six months, has a positive relationship with future firm value and profitability, represented by *Tobin's Q* and *ROA*, respectively. In contrast, we construct a comprehensive market sentiment

index from *CCI*, *VIX*, and *ADR* and find an inconclusive effect of market sentiment on corporate FP. We observe that the optimistic outlook of investors can enhance firm value but alleviate firm operating performance simultaneously. Moreover, the impact of market investors on a firm's performance is much more substantial than that of its shareholders.

Regarding the CSP–FP relationship, by employing ESG scores as the proxies of CSR performance, we discover a heterogeneous relationship between CSP and FP. Our evidence implies that successful performance in CSR strategies can accelerate firm value (measured by *Tobin's Q*) in the following year. However, such CSR achievement might also reduce firm profitability as ESG performance negatively affects *ROA*. Additionally, among the three ESG pillars, only the impacts of

social performance on *Tobin's Q* and environmental performance on *ROA* are statistically significant.

Finally, prior studies have claimed that investor sentiment also has a driving force on CSR strategies. Therefore, we wonder whether sentiment affects the CSP–FP relationship. The regression results reveal that investor sentiment, which is derived from the general mood of financial markets, can lessen the influence of ESG on FP.

Overall, our work not only verifies the significant relationship between CSR and FP but also finds the vital role of investor sentiment on firm performance, which has been researched by a few studies. We are also the first to discover the moderating effect of market sentiment on the CSP–FP relationship. Our main findings are robust when several substitute indicators are employed, and endogeneity problems are considered. Practically, this study provides more precise insight into the relationship between investors, CSR, and firm performance, which managers and policymakers can utilize to make decisions about their strategies in response to changes in investor behavior. A potential expansion of our work is to employ the quantile on quantile (QQ) approach and investigate the impact of different quantiles of sentiment and CSR on different quantiles of firm performance. This idea is derived from the study about the relationship between natural disasters and economic growth by [Atsalakis et al. \(2021\)](#), who confirmed that the results of the QQ approach differ from those obtained by standard approaches such as FE regressions. Similar studies about the sentiment role in the CSP–FP relationship conducted for other markets as verification of our findings in Japan would be appealing. We will address these issues in future work.

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Declaration of competing interest:

None.

References

- Aouadi, A., & Marsat, S. (2018). Do ESG controversies matter for firm value? Evidence from international data. *Journal of Business Ethics*, 151(4), 1027–1047.
- Arif, S., & Lee, C. M. (2014). Aggregate investment and investor sentiment. *The Review of Financial Studies*, 27(11), 3241–3279.
- Atan, R., Alam, M. M., Said, J., & Zamri, M. (2018). The impacts of environmental, social, and governance factors on firm performance. *Management of Environmental Quality: An International Journal*, 29(2), 182–194.
- Atsalakis, G. S., Bouri, E., & Pasiouras, F. (2021). Natural disasters and economic growth: A quantile on quantile approach. *Annals of Operations Research*, 306(1), 83–109.
- Baker, M., & Wurgler, J. (2007). Investor sentiment in the stock market. *Journal of Economic Perspectives*, 21(2), 129–152.
- Bascle, G. (2008). Controlling for endogeneity with instrumental variables in strategic management research. *Strategic Organization*, 6(3), 285–327.
- Brown, G. W., & Cliff, M. T. (2004). Investor sentiment and the near-term stock market. *Journal of Empirical Finance*, 11(1), 1–27.
- Buchanan, B., Cao, C. X., & Chen, C. (2018). Corporate social responsibility, firm value, and influential institutional ownership. *Journal of Corporate Finance*, 52, 73–95.
- Chen, Y. W., Chou, R. K., & Lin, C. B. (2019). Investor sentiment, SEO market timing, and stock price performance. *Journal of Empirical Finance*, 51, 28–43.
- Cheng, C. H. (2019). Share centralization, investor sentiment and firm performance. *International Journal of Business and Economics Research*, 8(3), 78–84.
- Cheong, C. W., Sinnakkannu, J., & Ramasamy, S. (2017). Reactive or proactive? Investor sentiment as a driver of corporate social responsibility. *Research in International Business and Finance*, 42, 572–582.
- Choi, J., & Wang, H. (2009). Stakeholder relations and the persistence of corporate financial performance. *Strategic Management Journal*, 30(8), 895–907.
- Chung, K. H., & Pruitt, S. W. (1994). A simple approximation of Tobin's q. *Financial Management*, 23(3), 70–74.
- Corredor, P., Ferrer, E., & Santamaria, R. (2013). Investor sentiment effect in stock markets: Stock characteristics or country-specific factors? *International Review of Economics & Finance*, 27, 572–591.
- Duque-Grisales, E., & Aguilera-Caracuel, J. (2021). Environmental, social and governance (ESG) scores and financial performance of multinationals: Moderating effects of geographic international diversification and financial slack. *Journal of Business Ethics*, 168(2), 315–334.
- El Ghoul, S., Guedhami, O., Kwok, C. C., & Mishra, D. R. (2011). Does corporate social responsibility affect the cost of capital? *Journal of Banking & Finance*, 35(9), 2388–2406.
- Fabozzi, F. J., Ng, P. W., & Tunaru, D. E. (2021). The impact of corporate social responsibility on corporate financial performance and credit ratings in Japan. *Journal of Asset Management*, 22(2), 79–95.
- Friede, G., Busch, T., & Bassen, A. (2015). ESG and financial performance: Aggregated evidence from more than 2000 empirical studies. *Journal of Sustainable Finance & Investment*, 5(4), 210–233.
- Garcia, A. S., Mendes-Da-Silva, W., & Orsato, R. J. (2017). Sensitive industries produce better ESG performance: Evidence from emerging markets. *Journal of Cleaner Production*, 150, 135–147.
- Global Sustainable Investment Alliance. (2019). *Global sustainable investment review*. April 2019.
- Guenster, N., Bauer, R., Derwall, J., & Koedijk, K. (2011). The economic value of corporate eco-efficiency. *European Financial Management*, 17(4), 679–704.
- Gunathilaka, C., Jais, M., & Balia, S. S. (2017). Illiquidity, investor sentiment and stock returns: Evidence from Malaysia. *International Journal of Economics and Financial Issues*, 7(4), 478–487.
- Han, J. J., Kim, H. J., & Yu, J. (2016). Empirical study on relationship between corporate social responsibility and financial performance in Korea. *Asian Journal of Sustainability and Social Responsibility*, 1(1), 61–76.
- Ioannou, I., & Serafeim, G. (2012). What drives corporate social performance? The role of nation-level institutions. *Journal of International Business Studies*, 43(9), 834–864.
- Jokar, H., & Daneshi, V. (2020). Investor sentiment, stock price, and audit quality. *International Journal of Managerial and Financial Accounting*, 12(1), 25–47.
- Kim, Y., Li, H., & Li, S. (2014). Corporate social responsibility and stock price crash risk. *Journal of Banking & Finance*, 43, 1–13.
- Lopez, M., Garcia, A., & Rodriguez, L. (2007). Sustainable development and corporate performance: A study based on the Dow Jones sustainability index. *Journal of Business Ethics*, 75(3), 285–300.
- McConnell, J. J., Servaes, H., & Lins, K. V. (2008). Changes in insider ownership and changes in the market value of the firm. *Journal of Corporate Finance*, 14(2), 92–106.
- McLean, R. D., & Zhao, M. (2014). The business cycle, investor sentiment, and costly external finance. *The Journal of Finance*, 69(3), 1377–1409.
- Minutolo, M. C., Kristjanpoller, W. D., & Stakeley, J. (2019). Exploring environmental, social, and governance disclosure effects on the S&P 500

- financial performance. *Business Strategy and the Environment*, 28(6), 1083–1095.
- Naughton, J. P., Wang, C., & Yeung, I. (2019). Investor sentiment for corporate social performance. *The Accounting Review*, 94(4), 401–420.
- Ortas, E., Álvarez, I., & Garayar, A. (2015). The environmental, social, governance, and financial performance effects on companies that adopt the United Nations Global Compact. *Sustainability*, 7(2), 1932–1956.
- Peng, C. W., & Yang, M. L. (2014). The effect of corporate social performance on financial performance: The moderating effect of ownership concentration. *Journal of Business Ethics*, 123(1), 171–182.
- Polk, C., & Sapienza, P. (2008). The stock market and corporate investment: A test of catering theory. *The Review of Financial Studies*, 22(1), 187–217.
- Rajesh, R. (2020). Exploring the sustainability performances of firms using environmental, social, and governance scores. *Journal of Cleaner Production*, 247, Article 119600.
- Reeb, D., Sakakibara, M., & Mahmood, I. P. (2012). From the editors: Endogeneity in international business research. *Journal of International Business Studies*, 43(3), 211–218.
- Rountree, B., Weston, J. P., & Allayannis, G. (2008). Do investors value smooth performance? *Journal of Financial Economics*, 90(3), 237–251.
- Saleh, M., Zulkifli, N., & Muhamad, R. (2011). Looking for evidence of the relationship between corporate social responsibility and corporate financial performance in an emerging market. *Asia-Pacific Journal of Business Administration*, 3(2), 165–190.
- Seok, S. I., Cho, H., & Ryu, D. (2019). Firm-specific investor sentiment and daily stock returns. *The North American Journal of Economics and Finance*, 50, Article 100857.
- Shakil, M. H., Mahmood, N., Tasnia, M., & Munim, Z. H. (2019). Do environmental, social and governance performance affect the financial performance of banks? A cross-country study of emerging market banks. *Management of Environmental Quality: An International Journal*, 30(6), 1331–1344.
- Shi, J., & Zhang, M. (2010, November). Investor sentiment, corporate investment, and firm performance. In *International Conference on Information Management, Innovation Management and Industrial Engineering* (Vol. 1, pp. 251–254). IEEE Computer Society.
- Škare, M., & Hasić, T. (2016). Corporate governance, firm performance, and economic growth—theoretical analysis. *Journal of Business Economics and Management*, 17(1), 35–51.
- Smales, L. A. (2017). The importance of fear: Investor sentiment and stock-market returns. *Applied Economics*, 49(34), 3395–3421.
- Theodoulidis, B., Diaz, D., Crotto, F., & Rancati, E. (2017). Exploring corporate social responsibility and financial performance through stakeholder theory in the tourism industries. *Tourism Management*, 62, 173–188.
- Thomson Reuters. (2017). *Thomson Reuters ESG scores*. March 2017.
- Velte, P. (2017). Does ESG performance have an impact on financial performance? Evidence from Germany. *Journal of Global Responsibility*, 8(2), 169–178.
- Vieira, E. S., Neves, M. E., & Dias, A. G. (2019). Determinants of Portuguese firms' financial performance: Panel data evidence. *International Journal of Productivity and Performance Management*, 68(7), 1323–1342.
- Wood, D. J. (1991). Corporate social performance revisited. *Academy of Management Review*, 16(4), 691–718.
- Yi, H., & Xiugang, Y. (2018). Investor sentiment and enterprise's non-efficient investment: The intermediary effect of stock price volatility. *International Journal of Business and Social Research*, 8(7), 1–14.
- Zainudin, Z., Zarina, M. Z., Razak, A. H., Hafezali, I. H., & Kantakji, M. H. (2019). Investor sentiment and firm financial performance of Malaysian IPO firms: Pre and post financial crisis. *International Journal of Financial Research*, 10(5), 450–458.
- Zhaohui, Z., & Wensheng, H. (2013). Investor sentiment and firms' investment: An empirical study based on catering channel. *Journal of Applied Sciences*, 13(8), 1199–1205.