

Corporate Social Responsibility and Firm Idiosyncratic Risk in Different Market States

Roger C.Y. Chen, Shih-Wei Hung* and Chen-Hsun Lee

National Kaohsiung University of Science and Technology, Kaohsiung, Taiwan

ABSTRACT

This study explored the influence of corporate social responsibility (CSR) on idiosyncratic risk. Referring to an approach used by Pagan and Sossounov, we separated the sample period into up-market, down-market, and correction conditions and observed the changes in the influence of CSR on idiosyncratic risk in different market states. The results find that firms with better CSR performance can reduce their idiosyncratic risk. Furthermore, in different market states, CSR can significantly decrease idiosyncratic risk, whereas firms with poorer CSR performance have more idiosyncratic risk. Our findings are beneficial for firms that can use CSR engagement to adjust their business strategy and reduce operational uncertainty. Therefore, CSR engagement can function as a tool for risk management. Copyright © 2018 John Wiley & Sons, Ltd and ERP Environment

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Introduction

CORPORATE SOCIAL RESPONSIBILITY (CSR) IS AN INCREASINGLY IMPORTANT ISSUE IN INTERNATIONAL BUSINESS. FOLLOWING THE economic crisis in 2008, more and more enterprises are actively engaging in CSR activities and publishing public reports on their involvement (Galema *et al.*, 2008). Furthermore, many multinational enterprises have incorporated CSR into their internal management, making it an important guideline for future investments (Attig *et al.*, 2016). However, business operations and market fluctuation are inseparable. Variation in economic circumstances and idiosyncratic risk both increase exposure to market risk, but it is idiosyncratic risk that has the greatest effect on management policy and investors' willingness to invest. The aim of this study was to determine whether CSR engagement influences a firm's operating strategy and thereby idiosyncratic risk.

Both practice and theory have long been occupied with the question of whether idiosyncratic risk can be reduced by the integration of CSR into management strategy, which would in turn increase profitability and investors' willingness to invest. Several previous studies have indicated that the reinforcement of CSR exerts a positive impact on revenue performance and increases a company's value (Fombrun *et al.*, 2000; Harjoto and Jo, 2011; Heal, 2005; Porter and van der Linde, 1995). Schuler and Cording (2006) postulated that CSR

*Correspondence to: Shih-Wei Hung, National Kaohsiung University of Science and Technology, Kaohsiung, Taiwan.
E-mail: stanleyh827@gmail.com

engagement positively influences consumer preferences, leading to increased sales. Guenster *et al.* (2011) confirmed that investors prefer to invest in companies with good CSR performance. In addition, Duran and Bajo (2014) pointed out that over 80% of multinational enterprises have listed CSR as one of their global management strategies. Marti *et al.* (2015) conducted research into the relationship between CSR and financial performance during periods of financial crisis. They discovered that those companies with higher levels of CSR engagement exhibited more stable financial performance. Such findings imply that companies with higher levels of CSR engagement experience lower operating risks. Su *et al.* (2016) studied firms targeting emerging markets and found that those participating in CSR activities exhibited better reputations, as well as increased operating and revenue performance. Therefore, it seems that not only does fulfilment of CSR exert positive effects on operating and financial performance, but it further lowers operational costs, increases management efficiency, creates new business models, and increases research and development (R&D) budgets as well as opportunities for future growth (Porter and Kramer, 2006; Chen *et al.*, 2013). Ioannou and Serafeim (2015) pointed out that market analysts forecast better financial performance for firms with higher levels of CSR engagement. Kumar *et al.* (2016) believed that fulfilment of CSR strengthens interaction with a firm's stakeholders and re-adjusts its operating strategies, leading to increases in both capital expenses and profits. Chen *et al.* (2017) further confirmed that integration of CSR into operational and management strategies, as well as corporate governance policies, increases the value of an enterprise. Similarly, Chen and Lee (2017) indicated that when CSR activities over a certain threshold, operating expenses use to decrease and positively affect a firm's value.

Moreover, Doh *et al.*'s (2009) study on the relationship between CSR and stock price performance clearly indicated that firms with better CSR performance have better return on equity (ROE), suggesting that investors have shifted their attention from maximization of a shareholder's profits to the interaction between a company and its stakeholders. Furthermore, companies that fulfil their CSR in terms of environmental protection and related themes have stock prices that notably outperform other companies (Flammer, 2013). Luo *et al.* (2015) postulated that a firm's ROE would benefit from allowing investors and analysts access to more comprehensive data on CSR engagement. Yadav *et al.* (2016) applied the event study method to discover that report of positive CSR accomplishments results in positive abnormal returns on stock prices, while exposure of a company's scandals leads to downward trends in the stock market (Xu *et al.*, 2016).

Some researchers also believed that firms can successfully use CSR accomplishments to attract the public's attention. This is often to disguise weak operating and management performance. CSR can become a kind of insurance policy for management, a tool to redirect the attention of stakeholders (Hemingway and Maclagan, 2004; Prior *et al.*, 2008). Barnea and Rubin (2010) pointed out that those firms utilizing CSR for these purposes are likely to over-invest in CSR and cause profitability to decrease. Agudo-Valiente *et al.* (2015) discussed the interaction between firms and their stakeholders, concluding that when companies build positive communication channels with stakeholders, the execution of CSR becomes increasingly difficult. Additionally, Viveros (2016) found that most stakeholders usually have a limited understanding of the company, which leads to a negative impact on the company's willingness to engage in CSR and, furthermore, causes negative effects on the company's operation and social development. Hawn and Ioannou (2016) pointed out that if there is a gap between what a firm claims and its actual CSR activities, the company will also be devalued.

Previous studies mostly focused on the relationship between CSR and operating performance. In contrast, little research exists on whether engaging in CSR can reduce idiosyncratic risk. Waddock and Graves (1997) subscribed that firms which fulfil their CSR face uncertain litigation and claims in the future, increasing operational risks and costs. Richardson *et al.* (1999) used the weighting average of cost capital (WACC) as a proxy variable to evaluate risk; they collected evidence that proper execution of CSR can help lower company risk. Gaspar and Massa (2006) believed that when firms operate within a highly competitive environment, idiosyncratic risk is significantly higher. In the face of market competition, a good operating strategy, including CSR activities, can contribute to the creation of solid relationships with stakeholders, thereby lowering idiosyncratic risk. Poddi and Vergalli (2009) used beta from the capital asset pricing model (CAPM) to measure company risk, and further researched the impact of CSR on beta. Their research showed that beta is negatively related to CSR accomplishments, meaning that a firm participating in CSR can effectively minimize operation uncertainties and lower company risks. Godfrey *et al.* (2009) believed that when a CEO's devotion to CSR is motivated by self-interest. However, empirical results showed that fulfilment of CSR grants an insurance effect in the face of unexpected

events, to guarantee a company's value. As Harjoto and Jo (2011) pointed out, CSR can minimize the damage caused by bad news, as well as the risk of falling stock prices. Dhaliwal *et al.* (2011) believed that pushing CSR and building a positive business image minimize the effects of asymmetric information and operating uncertainties. Jo and Na (2012) further explained that participating in CSR can strengthen risk management and lower company risk.

Kim *et al.* (2014) also indicated that CSR has a significant positive influence on operating risk. If managers decide to take on CSR in order to cover up unfavourable behaviour, company risk is amplified, as is the risk of bankruptcy. Koh *et al.* (2014) found that CSR can help a company to reduce the probability of facing lawsuits. Hockerts (2015) further explained that if a firm can draft a complete CSR strategy, integrating it into business activities builds solid relationships with stakeholders, which increases profitability and lowers operating risks. Kao *et al.* (2016) also found that if an enterprise can practise CSR, it would help to drop the total risk. As a result, Shiu and Yang (2017) believed that if a firm can engage in CSR, it would be insurance-like to the firm and diminish the possibility of stock prices pull back when sudden occurrence happens. This implies that when a company is facing market competition, it will need a good operation strategy and proper CSR execution, increasing interaction with stakeholders, in order to lower the idiosyncratic risk.

Many scholars have used the WACC, the cost of capital, or the beta of the CAPM as a proxy variable for a firm's risk. However, these variables are easily affected by market risk, which then leads to errors in the empirical results. The measurement of idiosyncratic risk may involve either direct decomposition or indirect decomposition. For instance, Campbell *et al.* (2001) conducted a regression analysis on market and industry, industry and stock returns to separate risk into market risk, industry risk, and idiosyncratic risk, this way is called an indirect decomposition method. Xu and Malkiel (2003) found that the direct decomposition approach proposed by Campbell *et al.* (2001) tends to overestimate risk, so they directly employed the squared residual of the Fama–French three-factor model as the proxy variable of idiosyncratic risk. Thus, such methods are referred to as direct decomposition methods. Based on the approach employed by Xu and Makiel (2003), Ang *et al.* (2006) and Chang and Dong (2006) also adopted the residuals of the CAPM and the Fama–French model to reduce risk overestimation, respectively, using the standard deviation of residuals and the natural logarithm of the residual sum of squares as the proxy variable for idiosyncratic risk.

However, a firm's risk varies with time and market states. Jo and Na (2012) and Kim *et al.* (2014) ignored the influence of market states on CSR and firm's risk and stock price crash risk. Then, the firm's risk can separate from market risk and idiosyncratic risk. As a result, this study examined the relationship between CSR and idiosyncratic risk using the methods proposed by Ang *et al.* (2006) and Chang and Dong (2006) to estimate idiosyncratic risk of firms. We also measure the CSR performance of listing firms in Taiwan using the CSR Index (CSRI) developed by Chen *et al.* (2013). Furthermore, we referred to the approach utilized by Pagan and Sossounov (2003) and separated the sample period into up-market, down-market, and correction conditions to examine the influence of CSR on idiosyncratic risk in different market states.

Our results suggest that engaging in CSR can significantly reduce uncertainties in firms and decrease idiosyncratic risk. In the different market states, the results also show negative relationships between CSR and idiosyncratic risk, which indicates that the best CSR performance can reduce idiosyncratic risk. On the other hand, the idiosyncratic risks of firms with the worst CSR performance are significantly higher, meaning that when firms cannot effectively practise CSR activities, that would raise operating uncertainties, which increases costs and idiosyncratic risk. This is particularly apparent in down-market conditions.

The contributions of this study to the literature on CSR and idiosyncratic risk are as follows. First, no previous study has investigated the influence of CSR performance and idiosyncratic risk. Therefore, this study provides new evidence on the CSR and firm's risk issue. Second, we employ three capital pricing models to estimate idiosyncratic risk and examine the relationship between CSR and idiosyncratic risk. Third, this study separates market states into up-market, down-market, and correction conditions to explore how market states influence CSR and idiosyncratic risk in firms. The empirical results of this study can fill the research gap in previous studies.

The remainder of this study is organized as follows. The first section introduces the methodology, variables, research sample, and data sources. The second section includes descriptive statistics and discusses empirical findings. The final section offers a conclusion.

Methodology and Data

Methodology

This study examined the influence of CSR on idiosyncratic risk. The majority of existing studies on idiosyncratic risk used the indirect decomposition method proposed by Campbell *et al.* (2001) to measure idiosyncratic risk (Gaspar and Massa, 2006). Xu and Malkiel (2003) felt that indirect decomposition methods tend to overestimate idiosyncratic risk, which affects empirical results. For this reason, we referred to the methods employed by Ang *et al.* (2006) and Chang and Dong (2006), which were based on the empirical method presented by Xu and Malkiel (2003), to gauge idiosyncratic risk and investigate the influence of CSR on idiosyncratic risk in different market states.

To more fully understand the influence of CSR on idiosyncratic risk, we employed CAPM, the three-factor model by Fama and French (1992) (Fama–French model), and the four-factor model from Carhart (1997) (Carhart model) to calculate the residuals of the regression models and estimate idiosyncratic risk using the methods presented by Ang *et al.* (2006) and Chang and Dong (2006). First, we employed the CAPM, the Fama–French model, and the Carhart model to estimate the residuals, as shown in Equations 1–3.

$$R_{i,t} = \alpha + \beta_1 RMRF_t + \varepsilon_{i,t} \quad (1)$$

$$R_{i,t} = \alpha + \beta_1 RMRF_t + \beta_2 SMB_t + \beta_3 HML_t + \varepsilon_{i,t} \quad (2)$$

$$R_{i,t} = \alpha + \beta_1 RMRF_t + \beta_2 SMB_t + \beta_3 HML_t + \beta_4 MTM_t + \varepsilon_{i,t} \quad (3)$$

Equation 1 is the regression model of the CAPM where $R_{i,t}$ denotes the risk premium of firm i in month t , and $RMRF_t$ is the market risk premium of month t . Equation 2 presents the regression model of the Fama–French model in which SMB_t indicates the firm size premium of month t , and HML_t is the book-to-market premium of month t . Equation 3 shows the regression model of the Carhart model where MTM_t is the momentum premium of month t . Finally, $\varepsilon_{i,t}$ denotes the residual of firm i in month t .

As previously mentioned, we used the methods proposed by Ang *et al.* (2006) and Chang and Dong (2006) to estimate the idiosyncratic risks of firms. The first estimation model presented by Ang *et al.* (2006) uses the standard deviation of the residuals in Equations 1–3 to measure idiosyncratic risk, expressed using $IR_{i,t}$, as shown in Equation 4.

$$IR_{i,t}^M = \sqrt{\text{var}(\varepsilon_{i,t})} \quad (4)$$

In Equation 4, $IR_{i,t}^M$ is the idiosyncratic risk formula from Ang *et al.* (2006) for firm i in model M of year y , where $M = 1, 2,$ and 3 indicating the CAPM, the Fama–French model, and the Carhart model, respectively; and $\varepsilon_{i,t}$ denotes the residual of firm i in month t .

Xu and Malkiel (2003) found that the residuals are prone to heteroscedasticity of the the methods proposed by Ang *et al.* (2006). Thereby, Chang and Dong (2006) divided the residual sum of squares by the number of samples and then took the natural logarithm, as shown in Equation 5.

$$IR_{2,i,y}^M = \ln \left(\sum_t^t (\varepsilon_{i,t})^2 / n_i \right) \quad (5)$$

In Equation 5, $IR_{2,i,y}^M$ is the idiosyncratic risk formula developed by Chang and Dong (2006) for firm i in year y , where $M = 1, 2,$ and 3 indicating the CAPM, the Fama–French model, and the Carhart model, respectively; $\varepsilon_{i,t}$ denotes the residual of firm i in month t ; n_i represents the number of samples for the said firm; and T is the length of the sample period.

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To determine the influence of CSR on idiosyncratic risk, we used ordinary least squares (OLS) to conduct a regression analysis. We used the CSRI from Chen *et al.* (2013) to measure the CSR performance of listing firms in Taiwan and the control variable settings from Gaspar and Massa (2006) to establish the regression model in Equation 6 and examine the relationship between CSR and idiosyncratic risk.

$$IR_{i,y} = \alpha_0 + \alpha_1 CSR_{i,y} + \alpha_2 X_{i,y} + e_{i,y} \quad (6)$$

In Equation 6, $IR_{i,y}$ indicates the idiosyncratic risk of firm i in year y ; $CSR_{i,y}$ denotes the CSR performance of firm i in year y , which includes the CSRI, Best CSR, and Worst CSR, among which the Best CSR and Worst CSR are dummy variables. The Best CSR means when firm with CSRI is greater or equal to the average of CSRI plus one standard deviation as 1; otherwise is 0 that represents the firm with best CSR performance. The Worst CSR represents the firm with worst performance of CSR that is less or equal to the average CSRI minus one standard deviation set as 1; otherwise, it is 0. $X_{i,y}$ denotes the control variables, which include the book-to-market ratio (B/M), stock price turnover, return on assets (ROA), debt ratio, R&D expenses of the previous year, firm age, and firm size.

Furthermore, to examine the influence of CSR on idiosyncratic risk in different market states, we referred to the approach by Pagan and Sossounov (2003) and separated the study period into up-market, down-market, and correction conditions for an empirical analysis based on the means and trends of stock market returns in Taiwan.

Data

The study period covered 5 years, from 2010 to 2014. The study samples were listing firms in Taiwan. After eliminating samples with incomplete data, we derived 796 sample firms with 3521 observed values. CSR data originated from the Market Observation Post System, annual reports for shareholders, CSR reports, and company websites. The financial data came from annual data in the *Taiwan Economic Journal*.

	Mean	Median	Standard deviation	Max	Min
Panel A: Firm's Characteristic Variables					
CSRI	13.2417	13.0000	4.0362	24.0000	0.0000
B/M	0.8349	0.7752	0.4178	3.4483	0.0061
Turnover ratio %	147.7218	98.7353	150.5938	1570.7747	0.3750
Debt ratio %	44.0195	43.4500	19.8626	97.6200	1.6800
ROA _(y) %	6.7027	6.2000	6.9475	46.5700	-28.4900
R&D _(y-1) %	2.0699	0.7523	3.5557	40.3121	0.0000
Age	31.7794	30.7918	13.7676	68.7151	1.0849
MV (NTD millions)	30,729	6,138	129,241	3,656,082	40
Panel B: Idiosyncratic Risk					
IR ₁ CAPM	1.7145	1.6546	0.6168	4.4458	0.3660
IR ₁ Fama–French model	1.6271	1.5638	0.5913	4.4390	0.3621
IR ₁ Carhart model	1.6174	1.5542	0.5877	4.4377	0.3441
IR ₂ CAPM	1.0403	1.0211	0.6012	2.9798	0.0001
IR ₂ Fama–French model	0.9558	0.9189	0.5806	2.9768	0.0018
IR ₂ Carhart model	0.9476	0.9082	0.5770	2.9762	0.0004

Table 1. Descriptive statistics of the principal variables.

Note: The sample consists of 796 listing firms in Taiwan during the 2010–2014 period. MV = Market value. See text for other abbreviations.

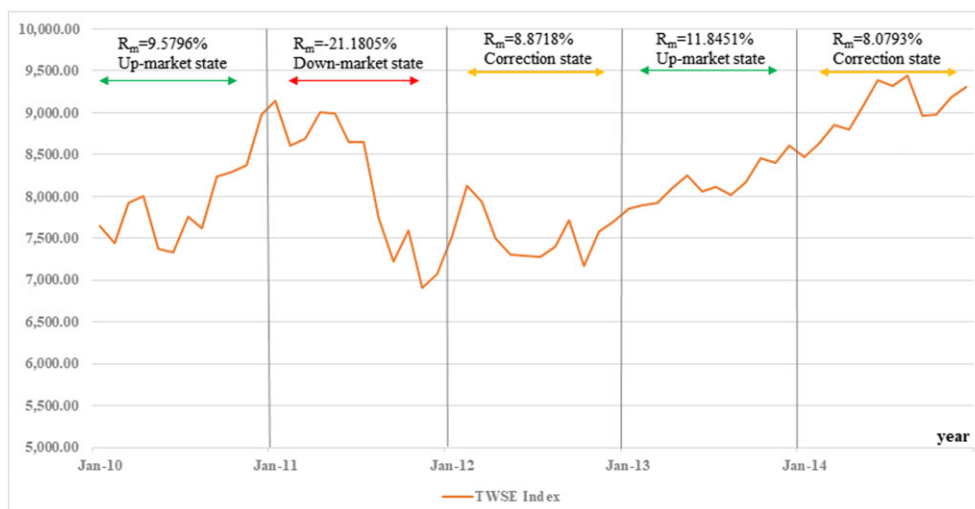


Figure 1. Taiwan Stock Exchange Index average annual returns (R_m) 2010–2014 with market status: up-market (2010, 2013), down-market (2011), and correction market (2012, 2014) states. [Colour figure can be viewed at wileyonlinelibrary.com]

		IR ₁			IR ₂		
		CAPM	Fama-French model	Carhart model	CAPM	Fama-French model	Carhart model
Best CSR	(1)	1.4660	1.4052	1.4106	0.8247	0.7741	0.7765
Worst CSR	(2)	1.9312	1.8418	1.8464	1.2168	1.1285	1.1327
Difference	(1)–(2)	−0.4652	−0.4366	−0.4358	−0.3921	0.3544	−0.3562
<i>t</i> -Value		−21.2877***	−20.7314***	−20.6835***	−18.6785***	−17.5595***	−17.6462***
Up-market (2010,2013)	(1)	1.7436	1.6660	1.6591	0.9731	0.8838	0.8751
Down-market (2011)	(2)	1.8116	1.7162	1.6990	1.0832	0.9694	0.9504
Correction (2012,2014)	(3)	1.6263	1.5341	1.5256	0.8251	0.7117	0.7005
Difference	(1)–(2)	−0.068	−0.0502	−0.0399	−0.1101	−0.0856	−0.0753
<i>t</i> -Value		−5.0890***	−3.8938***	−3.1117***	−7.0473***	−5.4950***	−4.8395***
Difference	(1)–(3)	0.1173	0.1319	0.1335	0.1480	0.1721	0.1746
<i>t</i> -Value		10.0254***	11.8210***	12.0049***	10.2903***	12.1176***	12.2796***
Difference	(2)–(3)	0.1853	0.1821	0.1734	0.2581	0.2577	0.2499
<i>t</i> -Value		14.2412***	14.6521***	14.0758***	16.1319***	16.2058***	15.7413***

Table 2. *T*–test statistics.

This table reports the results of the *t*-test for the CSRI, IR₁, and IR₂ from different CSR performance levels and market states, where Best CSR denotes for CSRI as more than or equal the mean add 1 standard errors is 1 and 0 otherwise and Worst CSR that CSRI is less than or equals the mean minus 1 standard errors is 1 and otherwise 0. The *t*-statistics are in parentheses.

***denotes significance at the 1% level. See text for abbreviations.

Empirical Results

Data Description

We conducted an empirical analysis to examine the relationship between CSR and idiosyncratic risk using the 28 industry categories established by the Taiwan Stock Exchange (TWSE) and Taipei Exchange (TPEX).¹ Table 1 presents the descriptive statistics for various variables. Panel A contains the firm characteristic variables, among

¹In February 2015, the Gre Tai Securities Market changed its name to the TPEX.

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which the average CSRI is 13.24 and the median is 13, which is higher than half of the full score (24). This shows that publicly traded firms in Taiwan maintain decent standards in CSR performance. The mean and median for ROA are 6.70 and 6.20, respectively, which means that the sample firms are quite profitable as a whole. For R&D expenses of the previous year [$R\&D_{(y-1)}$], the mean and median are 2.07 and 0.75, respectively, which show quite a difference. This implies that most of the listing firms in Taiwan do not place as much emphasis on R&D. Panel B shows the descriptive statistics regarding idiosyncratic risk. IR_1 was calculated using the estimation method by Ang *et al.* (2006). The mean and median of IR_1_CAPM are 1.71 and 1.65, respectively, which are lower than half of the maximum value (4.44). This means that most of the sample firms face lower idiosyncratic risk. IR_2 was calculated using the estimation method from Chang and Dong (2006).

To explore the influence of CSR on idiosyncratic risk in different market states, we used Pagan and Sossounov's (2003)² methodology to separate up-market, down-market, and correction conditions in the stock market in Taiwan. We employed the trends in the Taiwan Stock Exchange Index (TAIEX) to calculate the threshold values of annual return. Thus, years with an annual return greater than 9.55% that presented the stock market being upward trend were defined as up-market, those with an annual return lower than -7.87% that meant the stock market trending down were defined as down-market, and those in between were correction. Figure 1 exhibits the market states during the study period. In 2010 and 2013, we found the TAIEX average annual returns to be 9.58% and 11.85%, respectively, which were defined as up-market. The average annual return in 2011 was -21.18%, which represented down-market conditions. Finally, the average annual returns of 2012 and 2014 were 8.87% and 8.08%, respectively, which fell between -7.87% and 9.55% and were defined as correction conditions.

Table 2 reports the *t*-test results of IR_1 and IR_2 . Panel A shows the results of the firms' CSR performance. Firms with CSRI greater than the average CSRI plus a standard deviation were placed in the Best CSR, while those with CSRI less than the average CSRI minus a standard deviation were placed in the Worst CSR. The results indicate that the average difference values of IR_1_CAPM and IR_2_CAPM are -0.4652 and -0.3921, respectively, which indicate significant negative differences at the 1% level. This means that the idiosyncratic risks of firms with the best CSR performance are significantly lower than those of firms with the worst CSR performance. Panel B shows the idiosyncratic risks in different market states. The idiosyncratic risks in down-markets were the highest, significantly higher than those in up-markets and correction conditions at the 1% level. In contrast, the idiosyncratic risks in correction were the lowest.

CSR and Idiosyncratic Risk: The Whole Period

To examine the influence of CSR on idiosyncratic risk, we used the sample period as the 5 years from 2010 to 2014, when the TWSE and the TPEX promulgated 'Corporate Social Responsibility Best Practice Principles for TWSE/TPEX-Listed Companies'. We first calculated the idiosyncratic risk values IR_1 and IR_2 using Equations 4 and 5 and then performed an empirical analysis with OLS using the regression model in Equation 6 to investigate the relationship between CSR and idiosyncratic risk. With regard to the control variables, we referred to the settings dependent on Gaspar and Massa (2006), which include the B/M, stock price turnover, total ROA, debt ratio, R&D expenses of the previous year [$R\&D_{(t-1)}$], firm age, and the natural logarithm of firm market value [$\ln(MV)$]. The R&D expenses of the previous year were calculated by dividing the R&D expenses of the previous year by the total assets of the previous year. Furthermore, we also considered the year and industry-fixed effects during our regression analysis.

Table 3 presents the results of the regression analysis on CSR and idiosyncratic risk. The dependent variable of models (1) and (2) was the idiosyncratic risk value IR_1 calculated using the residual of the CAPM. The independent variable of model (1) was the CSRI, the regression coefficient of which is significantly negative at the 1% level (-0.0097). This means that firms promoting CSR can reduce their idiosyncratic risk. The independent variables of model (2), which examined the influence of different degrees of CSR performance on idiosyncratic

²Pagan and Sossounov (2003) used consecutive increases (decreases) in the stock market to calculate the threshold values of returns for up-market and down-market conditions and then used the threshold values to categorize market states.

	IR ₁					
	CAPM		Fama–French model		Carhart model	
	Model (1)	Model (2)	Model (3)	Model (4)	Model (5)	Model (6)
Intercept	2.9403*** (38.2300)	2.8480*** (35.7500)	2.8468*** (37.2600)	2.7533*** (34.8000)	2.8553*** (37.5500)	2.7633*** (35.0900)
CSRI	-0.0097*** (-4.3210)		-0.0101*** (-4.5230)		-0.0099*** (-4.4550)	
Best CSR		-0.0067 (-0.2807)		-0.0047 (-0.1959)		-0.0038 (-0.1609)
Worst CSR		0.1325*** (5.2430)		0.1365*** (5.4350)		0.1354*** (5.4190)
Control Variables						
B/M	-0.3992*** (-16.5700)	-0.4024*** (-16.7500)	-0.4271*** (-17.8500)	-0.4306*** (-18.0500)	-0.4287*** (-18.0000)	-0.4321*** (-18.2000)
Turnover	0.0017*** (29.5000)	0.0017*** (29.5800)	0.0015*** (26.3700)	0.0015*** (26.4600)	0.0015*** (26.2100)	0.0015*** (26.3000)
ROA	-0.0205*** (-14.7400)	-0.0203*** (-14.5800)	-0.0199*** (-14.4100)	-0.0197*** (-14.2500)	-0.0197*** (-14.3700)	-0.0195*** (-14.2100)
Debit ratio	0.0028*** (5.7620)	0.0027*** (5.6210)	0.0028*** (5.9360)	0.0028*** (5.7820)	0.0028*** (5.9520)	0.0027*** (5.8000)
R&D _(t-1)	-0.0017 (-0.6197)	-0.0018 (-0.6869)	-0.0031 (-1.1530)	-0.0033 (-1.2270)	-0.0032 (-1.2050)	-0.0034 (-1.2760)
Age	-0.0042*** (-6.1200)	-0.0042*** (-6.0340)	-0.0041*** (-6.0090)	-0.0040*** (-5.9180)	-0.0041*** (-5.9540)	-0.0040*** (-5.8630)
Ln(MV)	-0.1105*** (-15.5400)	-0.1175*** (-16.9100)	-0.1021*** (-14.4500)	-0.1097*** (-15.8900)	-0.1040*** (-14.8000)	-0.1115*** (-16.2300)
Year effect	Yes	Yes	Yes	Yes	Yes	Yes
Industry effect	Yes	Yes	Yes	Yes	Yes	Yes
Adj-R ²	0.5075	0.5087	0.4710	0.4724	0.4697	0.4712

Table 3. CSR and idiosyncratic risk in the whole period.

This table reports results from regressing the idiosyncratic risk (IR₁, IR₂) on CSR and control over the whole period, where Best CSR denotes for CSRI as more than or equal the mean add 1 standard errors is 1 and 0 otherwise and Worst CSR that CSRI is less than or equals the mean minus 1 standard errors is 1 and otherwise 0. The *t*-statistics are in parentheses.

***denotes significance at the 1% level. See text for abbreviations.

risk, were the dummy variables Best CSR and Worst CSR. The regression coefficient of the Best CSR is -0.0067, which is not significant. In contrast, the regression coefficient of the Worst CSR is 0.1325, which is significantly positive at the 1% level. This indicates that while the idiosyncratic risks of firms with better CSR performance are lower they are non-significant. However, the idiosyncratic risks of firms with poorer CSR performance are significantly higher, implying that if firms cannot practise CSR engagement, uncertainties in business will increase (Hong and Kacperczyk, 2009). Furthermore, there are similar results for IR₁ and IR₂ from the CAPM, the Fama–French model, and the Carhart model in model (3) to model (12). As indicated by Dhaliwal *et al.* (2011), engaging in CSR can increase interactions with stakeholders, mitigate information asymmetry, and reduce uncertainties.

The empirical results report that CSR is not just an expense; it is more like an investment. If firms can engage in CSR to improve or adjust their operations, it will reduce the difference between internal and external information and create more interactions with stakeholders, which can therefore eliminate uncertainties, decrease idiosyncratic risk, and create sustainable operations. In contrast, if firms do not engage in CSR-related activities, a greater gap will increase between internal and external information, which leads to uncertainties, more probabilities of litigation, and higher idiosyncratic risk.

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	IR ₂					
	CAPM		Fama–French model		Carhart model	
	Model (7)	Model (8)	Model (9)	Model (10)	Model (11)	Model (12)
Intercept	2.1300*** (22.8100)	2.0096*** (20.7600)	2.0699*** (21.7300)	1.9455*** (19.7100)	2.0877*** (21.9100)	1.9644*** (19.8900)
CSRI	-0.0126*** (-4.6270)		-0.0133*** (-4.7720)		-0.0131*** (-4.7130)	
Best CSR		-0.0274 (-0.9386)		-0.0234 (-0.7868)		-0.0236 (-0.7901)
Worst CSR		0.1502*** (4.8910)		0.1606*** (5.1270)		0.1591*** (5.0750)
Control Variables						
B/M	-0.4311*** (-14.7400)	-0.4353*** (-14.9100)	-0.4848*** (-16.2500)	-0.4893*** (-16.4400)	-0.4888*** (-16.3800)	-0.4932*** (-16.5600)
Turnover	0.0019*** (28.2100)	0.0019*** (28.2400)	0.0018*** (26.2000)	0.0018*** (26.2400)	0.0018*** (26.1100)	0.0018*** (26.1500)
ROA	-0.0215*** (-12.7300)	-0.0213*** (-12.6200)	-0.0219*** (-12.7400)	-0.0217*** (-12.6200)	-0.0218*** (-12.6800)	-0.0217*** (-12.5700)
Debit ratio	0.0035*** (5.9390)	0.0034*** (5.8090)	0.0036*** (5.9860)	0.0035*** (5.8440)	0.0036*** (5.9840)	0.0035*** (5.8450)
R&D _(t-1)	0.0019 (0.5865)	0.0016 (0.4952)	0.0002 (0.0609)	-0.0001 (-0.0322)	0.0001 (0.0249)	-0.0002 (-0.0666)
Age	-0.0046*** (-5.4910)	-0.0045*** (-5.4080)	-0.0047*** (-5.5090)	-0.0046*** (-5.4210)	-0.0047*** (-5.4670)	-0.0046*** (-5.3810)
Ln(MV)	-0.1146*** (-13.2800)	-0.1227*** (-14.5300)	-0.1084*** (-12.3200)	-0.1174*** (-13.6300)	-0.1116*** (-12.6700)	-0.1204*** (-13.9800)
Year effect	Yes	Yes	Yes	Yes	Yes	Yes
Industry effect	Yes	Yes	Yes	Yes	Yes	Yes
Adj-R ²	0.5048	0.5054	0.4774	0.4781	0.4767	0.4774

Table 3. (Continued)

CSR and Idiosyncratic Risk: Up-Market States

In order to understand how the influence of CSR and idiosyncratic risk during up-market states was, we employed Equation 6 to examine the relationship between CSR and idiosyncratic risk in up-market states.

Table 4 reports the empirical results of the relationship between idiosyncratic risk and CSR in up-market states. According to this table, the idiosyncratic risk and CSRI are significantly and negatively related. In model (1), the regression coefficient of the CSRI is -0.0171 and significant at the 1% level. This demonstrates that firms with good CSR performance during up-market states can reduce their idiosyncratic risk. In model (2), the regression coefficient of independent variable Best CSR is insignificant, and the *t*-value of the Worst CSR is significantly positive at the 1% level. This indicates that firms which cannot effectively practise their CSR will increase their idiosyncratic risk rather than reduce it. This implies that investors will have less trust in firms with poor CSR performance, and even in up-markets, the stock prices of these firms will fluctuate more sharply than those of other firms. These results also indicate that these firms have many uncertainties during operations, thereby leading to an increase in idiosyncratic risk during up-market conditions. The results of models (3) through (6) and the empirical results of IR₂ and CSR in models (7) through (12) all show similar results to those of models (1) and (2), which further find that engaging in CSR can reduce a firm's idiosyncratic risk. In contrast, firms that cannot effectively promote their CSR will instead have greater idiosyncratic risk.

	IR _t					
	CAPM		Fama–French model		Carhart model	
	Model (1)	Model (2)	Model (3)	Model (4)	Model (5)	Model (6)
Intercept	3.3509*** (26.5800)	3.2118*** (24.0700)	3.2661*** (26.0400)	3.1397*** (23.6800)	3.2685*** (26.1500)	3.1446*** (23.8000)
CSRI	-0.0171*** (-4.7340)		-0.0152*** (-4.2330)		-0.0149*** (-4.1620)	
Best CSR		-0.0233 (-0.5478)		-0.0109 (-0.2578)		-0.0093 (-0.2202)
Worst CSR		0.1890*** (4.6830)		0.1839*** (4.5860)		0.1820*** (4.5540)
Control Variables						
B/M	-0.5317*** (-11.4900)	-0.5428*** (-11.7700)	-0.5554*** (-12.0600)	-0.5646*** (-12.3200)	-0.5544*** (-12.0800)	-0.5634*** (-12.3400)
Turnover	0.0015*** (17.4000)	0.0015*** (17.6100)	0.0012*** (14.8600)	0.0013*** (15.0800)	0.0012*** (14.8400)	0.0013*** (15.0600)
ROA	-0.0184*** (-7.8950)	-0.0184*** (-7.8620)	-0.0178*** (-7.6690)	-0.0177*** (-7.6120)	-0.0178*** (-7.6880)	-0.0177*** (-7.6290)
Debit ratio	0.0041*** (5.1570)	0.0040*** (4.9480)	0.0042*** (5.2250)	0.0040*** (5.0310)	0.0042*** (5.2140)	0.0040*** (5.0210)
R&D _(t-1)	-0.0058 (-1.3050)	-0.0065 (-1.4660)	-0.0063(-1.4220)	-0.0069 (-1.5570)	-0.0064 (-1.4390)	-0.0069 (-1.5710)
Age	-0.0037*** (-3.1870)	-0.0037*** (-3.1880)	-0.0035*** (-3.0130)	-0.0035*** (-3.0160)	-0.0035*** (-3.0070)	-0.0035*** (-3.0100)
Ln(MV)	-0.1292*** (-11.0200)	-0.1404*** (-12.0300)	-0.1251*** (-10.7200)	-0.1353*** (-11.6600)	-0.1265*** (-10.8700)	-0.1364*** (-11.8100)
Industry effect	Yes	Yes	Yes	Yes	Yes	Yes
Adj-R ²	0.4767	0.4763	0.4386	0.4395	0.4398	0.4408

Table 4. CSR and idiosyncratic risk in up-market states.

This table reports results from regressing the idiosyncratic risk (IR_t, IR₂) on CSR and control over the up-market states, where Best CSR denotes for CSRI as more than or equal the mean add 1 standard errors is 1 and 0 otherwise and Worst CSR that CSRI is less than or equals the mean minus 1 standard errors is 1 and otherwise 0. The *t*-statistics are in parentheses.

***denotes significance at the 1% level. See text for abbreviations.

operating strategies and enhance their competitiveness (Porter and Kramer, 2006). As they review and adjust their operating strategies, they find many uncertainties and eliminate them, thereby reducing idiosyncratic risk.

CSR and Idiosyncratic Risk: Down-Market States

In the down-markets, when the stock market had gone to fall, the firm's revenue gradually reduced and raise idiosyncratic risk in operations. Hence, we explored whether engaging in CSR can reduce a firm's idiosyncratic risk during down-markets. We performed an empirical analysis using the regression model in Equation 6 for years defined as bear markets and examined the results.

Among the results in Table 5, models (1) and (2) present the regression results of idiosyncratic risk value IR_t, which was calculated using the CAPM, and CSR. As can be seen, the regression coefficient and *t*-value of the CSRI, the primary independent variable of model (1), are -0.0093, which is significant at the 10% level. This implies that firms engaging in CSR can also effectively reduce their idiosyncratic risk during down-markets. In model (2), we employed the Best CSR and Worst CSR as dummy variables in the regression analysis. The coefficient of the Worst CSR is 0.1224, which is significantly positive at the 5% level. This indicates that firms with poor CSR

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	IR ₂					
	CAPM		Fama–French model		Carhart model	
	Model (7)	Model (8)	Model (9)	Model (10)	Model (11)	Model (12)
Intercept	2.5516*** (14.8500)	2.3530*** (14.8500)	2.4997*** (16.4700)	2.3127*** (14.3900)	2.5125*** (16.5700)	2.3287*** (14.4900)
CSRI	−0.0235*** (−5.4980)		−0.0217*** (−4.9830)		−0.0213*** (−4.8980)	
Best CSR		−0.0770 (−1.5250)		−0.0600 (−1.1720)		−0.0584 (−1.1410)
Worst CSR		0.2166*** (4.5190)		0.2186*** (4.4960)		0.2156*** (4.4370)
Control Variables						
B/M	−0.5587*** (−10.1900)	−0.5744*** (−10.4900)	−0.6053*** (−10.8600)	−0.6189*** (−11.1400)	−0.6059*** (−10.8800)	−0.6193*** (−11.1500)
Turnover	0.0018*** (18.0700)	0.0018*** (18.1800)	0.0016*** (16.2500)	0.0017*** (16.4000)	0.0016*** (16.2500)	0.0017*** (16.4000)
ROA	−0.0180*** (−6.5160)	−0.0182*** (−6.5520)	−0.0182*** (−6.4790)	−0.0183*** (−6.4840)	−0.0182*** (−6.4810)	−0.0183*** (−6.4830)
Debit ratio	0.0048*** (5.0150)	0.0046*** (4.8190)	0.0049*** (5.0300)	0.0047*** (4.8460)	0.0048*** (5.0200)	0.0047*** (4.8380)
R&D _(t−1)	−0.0027 (−0.5016)	−0.0038 (−0.7087)	−0.0036 (−0.6723)	−0.0046 (−0.8498)	−0.0037 (−0.6828)	−0.0046 (−0.8569)
Age	−0.0039*** (−2.8360)	−0.0039*** (−2.8230)	−0.0038*** (−2.7100)	−0.0038*** (−2.6990)	−0.0038*** (−2.6990)	−0.0038*** (−2.6880)
Ln(MV)	−0.1260*** (−9.0630)	−0.1389*** (−10.0200)	−0.1249*** (−8.8460)	−0.1370*** (−9.7420)	−0.1276*** (−9.0430)	−0.1395*** (−9.9270)
Industry effect	Yes	Yes	Yes	Yes	Yes	Yes
Adj-R ²	0.4799	0.4769	0.4507	0.4492	0.4525	0.4511

Table 4. (Continued)

performance during down-markets will increase idiosyncratic risk as their stock prices fall. The results of models (3) through (6), in which the idiosyncratic risk value IR₁ calculated using the residual of Fama–French model and the Carhart model served as the dependent variable, and the results of models (7) through model (12), in which IR₂ served as the dependent variable, verified the results of models (1) and (2), we find the CSR performance and idiosyncratic risk are negatively significant that engaging in CSR can significantly reduce idiosyncratic risk during down-markets, whereas firms with poor CSR performance will increase idiosyncratic risk as the stock market fall.

Thus, the empirical results show that when the stock market is falling, engaging in CSR can significantly reduce the idiosyncratic risk that firms face in down-markets. In contrast, the idiosyncratic risk of firms with poor CSR performance does not decrease but increase. This implies that when firms encounter down-markets they can still reduce uncertainties and operate steadily. Firms with poor CSR performance, however, may encounter more sudden incidents and increased idiosyncratic risk, which also increase the probability of bankruptcy.

CSR and Idiosyncratic Risk: Correction Market States

Aside from up-markets and down-markets, there are also correction market states. To understand the relationship between CSR and idiosyncratic risk in corrections, we also conducted a regression analysis of correction markets using the regression model in Equation 6.

	IR ₁					
	CAPM		Fama–French model		Carhart model	
	Model (1)	Model (2)	Model (3)	Model (4)	Model (5)	Model (6)
Intercept	2.5936*** (17.1400)	2.5775*** (16.1400)	2.5150*** (16.4100)	2.5020*** (15.4900)	2.5185*** (16.4800)	2.5058*** (15.5600)
CSRI	−0.0093* (−1.8700)		−0.0095* (−1.8990)		−0.0095* (−1.8920)	
Best CSR		0.0722 (1.3140)		0.0824 (1.4830)		0.0827 (1.4920)
Worst CSR		0.1224** (2.4880)		0.1296*** (2.6050)		0.1294*** (2.6080)
Control Variables						
B/M	−0.2334*** (−5.7040)	−0.2393*** (−5.8570)	−0.2689*** (−6.4900)	−0.2752*** (−6.6580)	−0.2728*** (−6.6040)	−0.2791*** (−6.7730)
Turnover	0.0023*** (17.5800)	0.0023*** (17.7100)	0.0021*** (16.3700)	0.0021*** (16.5200)	0.0021*** (16.1100)	0.0021*** (16.2600)
ROA	−0.0231*** (−8.3040)	−0.0228*** (−8.1830)	−0.0229*** (−8.1270)	−0.0226*** (−8.0060)	−0.0226*** (−8.0520)	−0.0223*** (−7.9300)
Debit ratio	0.0018* (1.9050)	0.0017* (1.8050)	0.0019* (1.9490)	0.0018* (1.8430)	0.0019* (1.9580)	0.0018* (1.8510)
R&D _(t-1)	−0.0065 (−1.1670)	−0.0060 (−1.0750)	−0.0100 (−1.7580)	−0.0094* (−1.6580)	−0.0109* (−1.9330)	−0.0104* (−1.8330)
Age	−0.0040*** (−2.8630)	−0.0038*** (−2.7350)	−0.0041*** (−2.8800)	−0.0039*** (−2.7410)	−0.0040*** (−2.8130)	−0.0038*** (−2.6740)
Ln(MV)	−0.0698*** (−4.8090)	−0.0840*** (−5.9980)	−0.0619*** (−4.2090)	−0.0771*** (−5.4400)	−0.0633*** (−4.3180)	−0.0785*** (−5.5520)
Industry effect	Yes	Yes	Yes	Yes	Yes	Yes
Adj-R ²	0.5324	0.5347	0.5024	0.5055	0.4915	0.4947

Table 5. CSR and idiosyncratic risk in down-market states.

This table reports results from regressing the idiosyncratic risk (IR₁, IR₂) on CSR and control over the down-market state, where Best CSR denotes for CSRI as more than or equal the mean add 1 standard errors is 1 and 0 otherwise and Worst CSR that CSRI is less than or equals the mean minus 1 standard errors is 1 and otherwise 0. The *t*-statistics are in parentheses. *, **, and *** denote significance at the 10%, 5%, and 1% levels, respectively. See text for abbreviations.

Among the results in Table 6, models (1) and (2) present the regression results of CSR and the dependent variable IR₁, which was calculated using the residual of the CAPM. As can be seen, the regression coefficient of the CSRI, the primary independent variable of model (1), is -0.0073 , which is significantly negative at the 5% level. This indicates that better CSR performance during corrections can substantially help firms reduce idiosyncratic risk. In model (2), the regression coefficient *t*-value of the Best CSR is significantly negative. This means that firms with good CSR performance in correction states will have lower idiosyncratic risk. In models (9) and (10), idiosyncratic risk IR₂, which was calculated using the residual from the Fama–French model, served as the dependent variable. The results of model (9) indicate that the regression coefficient of the CSRI is -0.0121 , which is significantly negative at the 1% level. The regression coefficients of the Best CSR and Worst CSR in model (10) are significant. These results indicate that practising CSR in corrections can reduce the probability of sudden incidents, which thereby reduces idiosyncratic risk. The idiosyncratic risk of firms with good CSR performance is significantly lower, which means that when the market situation is uncertain, firms with good CSR performance can still make adjustments, improve their operations, continue to interact with stakeholders, and reduce information asymmetry, thereby reducing uncertainties and idiosyncratic risk. In contrast, firms with poor CSR performance may have greater idiosyncratic risk.

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	IR ₂					
	CAPM		Fama–French model		Carhart model	
	Model (7)	Model (8)	Model (9)	Model (10)	Model (11)	Model (12)
Intercept	1.7217*** (9.8290)	1.6944*** (9.1370)	1.6767*** (9.1410)	1.6533*** (8.5210)	1.6885*** (9.2000)	1.6652*** (8.5780)
CSRI	−0.0114** (−1.9840)		−0.0120** (−2.0040)		−0.0120** (−1.9910)	
Best CSR		0.0344 (0.5392)		0.0548 (0.8220)		0.0556 (0.8335)
Worst CSR		0.1003** ^v		0.1187** (1.9850)		0.1194** (1.9960)
Control Variables						
B/M	−0.2105*** (−4.4450)	−0.2174*** (−4.5820)	−0.2686*** (−5.4170)	−0.2764*** (−5.5670)	−0.2750*** (−5.5420)	−0.2826*** (−5.6900)
Turnover	0.0024*** (16.0800)	0.0024*** (16.1300)	0.0024*** (15.2100)	0.0024*** (15.2900)	0.0023*** (15.0800)	0.0024*** (15.1600)
ROA	−0.0224*** (−6.9630)	−0.0223*** (−6.8860)	−0.0233*** (−6.9200)	−0.0231*** (−6.8330)	−0.0232*** (−6.8920)	−0.0230*** (−6.8050)
Debit ratio	0.0028** (2.5430)	0.0027** (2.4600)	0.0029** (2.4960)	0.0028** (2.4030)	0.0029** (2.4680)	0.0028** (2.3750)
R&D _(t-1)	−0.0019 (−0.2953)	−0.0018 (−0.2745)	−0.0052 (−0.7693)	−0.0049 (−0.7271)	−0.0063 (−0.9269)	−0.0060 (−0.8830)
Age	−0.0041** (−2.5120)	−0.0040** (−2.4490)	−0.0044*** (−2.6070)	−0.0043** (−2.5230)	−0.0044** (−2.5750)	−0.0043** (−2.4900)
Ln(MV)	−0.0680*** (−4.0480)	−0.0825*** (−5.0710)	−0.0617*** (−3.5050)	−0.0782*** (−4.5950)	−0.0637*** (−3.6200)	−0.0802*** (−4.7100)
Industry effect	Yes	Yes	Yes	Yes	Yes	Yes
Adj-R ²	0.5036	0.5024	0.4803	0.4800	0.4729	0.4764

Table 5. (Continued)

The empirical results indicate that engaging in CSR and idiosyncratic risk have a significantly negative relationship in correction market states. Thus, firms with good CSR performance have substantially lower idiosyncratic risk in correcting markets, which implies that when market prospects and information are uncertain, engaging in CSR is even more crucial. By participating in CSR-related activities, firms can increase interactions with stakeholders, reduce information asymmetry, and gain the capacity to deal with future changes in the economic market and environment, which thereby reduce idiosyncratic risk. Thus, for firms with good CSR performance, significantly fewer uncertainties exist during operations as well as lower idiosyncratic risk.

Conclusions

It has long been undecided as to whether engaging in CSR can reduce a firm's idiosyncratic risk. Many scholars have advocated that idiosyncratic risk comes from a firm's own operating conditions and that idiosyncratic risk can be reduced via information disclosure. Other researchers argue that fulfilling CSR can effectively eliminate many uncertainties during operations and thereby reduce idiosyncratic risk. Does this imply that engaging in CSR can improve information quality, create more opportunities for interactions with stakeholders, reduce idiosyncratic risk, and enhance operating efficiency? However, few researchers have considered whether the relationship between CSR

	IR ₁					
	CAPM		Fama–French model		Carhart model	
	Model (1)	Model (2)	Model (3)	Model (4)	Model (5)	Model (6)
Intercept	3.0529*** (26.5100)	2.9743*** (25.0800)	2.9416*** (26.0500)	2.8595*** (24.5800)	2.9555*** (26.3400)	2.8744*** (24.8700)
CSRI	-0.0073** (-2.2420)		-0.0081** (-2.5420)		-0.0080** (-2.5160)	
Best CSR		-0.0651** (-1.9880)		-0.0631** (-1.9660)		-0.0621* (-1.9460)
Worst CSR		0.0463 (1.1150)		0.0549 (1.3480)		0.0546 (1.3500)
Control Variables						
B/M	-0.3818*** (-10.4700)	-0.3839*** (-10.5400)	-0.4153*** (-11.6100)	-0.4177*** (-11.6900)	-0.4179*** (-11.7600)	-0.4203*** (-11.8300)
Turnover	0.0017*** (18.6500)	0.0017*** (18.6200)	0.0015*** (16.7300)	0.0015*** (16.7100)	0.0015*** (16.5700)	0.0014*** (16.5500)
ROA	-0.0180*** (-8.6760)	-0.0182*** (-8.7370)	-0.0179*** (-8.8020)	-0.0181*** (-8.8450)	-0.0178*** (-8.8110)	-0.0180*** (-8.8530)
Debit ratio	0.0021*** (2.8660)	0.0021*** (2.8530)	0.0021*** (2.9750)	0.0021*** (2.9510)	0.0021*** (2.9850)	0.0021*** (2.9610)
R&D _(t-1)	0.0016 (0.3992)	0.0013 (0.3156)	0.0008 (0.2109)	0.0004 (0.1101)	0.0010 (0.2620)	0.0006 (0.1629)
Age	-0.0052*** (-5.1000)	-0.0052*** (-5.0940)	-0.0049*** (-4.9170)	-0.0049*** (-4.9070)	-0.0049*** (-4.8870)	-0.0049*** (-4.8780)
Ln(MV)	-0.1144*** (-10.7700)	-0.1158*** (-11.1500)	-0.1042*** (-9.9960)	-0.1066*** (-10.4700)	-0.1066*** (-10.2900)	-0.1089*** (-10.7700)
Industry effect	Yes	Yes	Yes	Yes	Yes	Yes
Adj-R ²	0.5231	0.5230	0.4847	0.4842	0.4850	0.4846

Table 6. CSR and idiosyncratic risk in corrections.

This table reports results from regressing the idiosyncratic risk (IR₁, IR₂) on CSR and control over the correction state, where Best CSR denotes for CSRI as more than or equal the mean add 1 standard errors is 1 and 0 otherwise and Worst CSR that CSRI is less than or equals the mean minus 1 standard errors is 1 and otherwise 0. The *t*-statistics are in parentheses. *, **, and *** denote significance at the 10%, 5%, and 1% levels, respectively. See text for abbreviations.

and idiosyncratic risk changes with different market states. In view of this, we separated the study period based on market states and employed the CSRI from Chen *et al.* (2013) to examine the influence of CSR on idiosyncratic risk.

This research showed that CSR execution can help with risk management and lower idiosyncratic risk. This finding coincides with that of Jo and Na (2012), who indicated that CSR execution can decrease information asymmetry between the company and stakeholders. In addition, this research also found that in both up- and down-trending markets, the effect of CSR execution is still significant. Furthermore, there is a correlation between poor performance in CSR and increased levels of idiosyncratic risk. This implies that CSR execution, careful management, and effective operating strategies can reduce operating uncertainties. Moreover, CSR and the company's idiosyncratic risk have unfavourable effects on each other when the market is going through a correction phase. As Hockerts (2015) pointed out, when the market faces uncertainties, if a firm can continue to push CSR, build communication channels and interact with stakeholders, and improve operating strategies, then development will be assisted and idiosyncratic risk lowered.

Empirical results show that the effect of CSR in different market states has a vital influence on a firm's idiosyncratic risk. This clearly stated that a firm by pushing CSR strategy, increase the relationship with stakeholder and decrease the information asymmetry, re-examine the uncertainties caused by business activities, and amend

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	IR ₂					
	CAPM		Fama–French model		Carhart model	
	Model (7)	Model (8)	Model (9)	Model (10)	Model (11)	Model (12)
Intercept	2.3738*** (15.9300)	2.2638*** (14.7500)	2.3007*** (15.2800)	2.1858*** (14.0900)	2.3280*** (15.4400)	2.2124*** (14.2400)
CSRI	-0.0112*** (-2.6470)		-0.0121*** (-2.8320)		-0.0121*** (-2.8390)	
Best CSR		-0.0804* (-1.8970)		-0.0789* (-1.8420)		-0.0804* (-1.8750)
Worst CSR		0.0798 (1.4850)		0.0905* (1.6650)		0.0893 (1.6410)
Control Variables						
B/M	-0.4236*** (-8.9770)	-0.4270*** (-9.0530)	-0.4893*** (-10.2600)	-0.4932*** (-10.3400)	-0.4939*** (-10.3500)	-0.4978*** (-10.4300)
Turnover	0.0019*** (16.7800)	0.0019*** (16.7600)	0.0018*** (15.6700)	0.0018*** (15.6600)	0.0018*** (15.5600)	0.0018*** (15.5500)
ROA	-0.0188*** (-6.9930)	-0.0190*** (-7.0330)	-0.0200*** (-7.3560)	-0.0201*** (-7.3770)	-0.0199*** (-7.3100)	-0.0201*** (-7.3360)
Debit ratio	0.0029*** (3.0800)	0.0029*** (3.0500)	0.0029*** (3.0910)	0.0029*** (3.0520)	0.0030*** (3.1110)	0.0029*** (3.0730)
R&D _(t-1)	0.0045 (0.8730)	0.0040 (0.7676)	0.0035 (0.6653)	0.0029 (0.5492)	0.0037 (0.7146)	0.0031 (0.5980)
Age	-0.0063*** (-4.7540)	-0.0063*** (-4.7420)	-0.0063*** (-4.6620)	-0.0062*** (-4.6490)	-0.0062*** (-4.6380)	-0.0062*** (-4.6240)
Ln(MV)	-0.1255*** (-9.1230)	-0.1294*** (-9.6310)	-0.1177*** (-8.4670)	-0.1227*** (-9.0360)	-0.1215*** (-8.7330)	-0.1265*** (-9.3030)
Industry effect	Yes	Yes	Yes	Yes	Yes	Yes
Adj-R ²	0.5045	0.5039	0.4768	0.4759	0.4769	0.4761

Table 6. (Continued)

accordingly to minimize the chance of sudden events. Especially when current markets fluctuate dramatically, by bringing in CSR strategy, as Coase theorem, when a company internalize the exterior expense, create profits and reduce the cost of communication with stakeholder at the same time, furthermore, can trim down the idiosyncratic risk and operation cost. Hence, introducing CSR into a business strategy has become essential in business management and an important tool for risk management.

This research showed that management and investors should be equipped with solid practical management experience and knowledge. Firms should not only work on maximizing profits for stockholders, but also focus attention on CSR and its implementation. Firms should also reinforce the relationship with stakeholders, integrate business operation strategy, lower uncertainties caused by changing markets, and minimize idiosyncratic risk. In terms of investment, investors should understand the company in which they invest via basic analysis as well as the firm's CSR strategies. This not only lowers investment risk, but can also improve the stability of the selected investment targets.

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