



THE INSURANCE VALUE OF CSR DURING THE FINANCIAL CRISIS IN TAIWAN

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ABSTRACT

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This study examines the impact of CSR activities on corporate financial performance by using data from 514 listed companies in Taiwan during the period of the 2008 financial crisis. To measure the CSR performance, this study refers to independent international CSR valuation institutions to compile CSR indicators for individual Taiwanese firms. The results show that CSR activities before the 2008 financial crisis are associated with positive stock returns during the crisis. In addition, after comparing the in-crisis and post-crisis periods, it is found that CSR indeed offers an insurance value for a firm's stock performance during the crisis period. We conclude that CSR does play a protective role for firms when a market encounters a widespread trust crisis. Furthermore, the results highlight the importance of wider engagement in CSR practices for firms, not only to boost their reputation but also for the insurance value, which will pay off during unexpected negative trust events.

Contribution/Originality: This study uses a new estimation methodology to evaluate the CSR performance of listed firms in Taiwan during the financial crisis period. The paper not only addresses the problem of a lack of consistent CSR metrics for firms in a developing economy but also proposes a reasonable method for evaluating these firms' environmental efforts.

1. INTRODUCTION

With the collapse of Lehman Brothers during the financial crisis of 2007-2008, the trust in the global capital market was eroded, highlighting the importance of Corporate Social Responsibility (CSR) investments at the firm level. According to a recent study, Lins, Servaes, and Tamayo (2017) suggest that firm-specific social capital can be viewed as an insurance policy that pays off when stakeholders, as well as the entire economy, are faced with a serious trust crisis. Other studies demonstrate that social performance creates not only wealth-enhancing value but also insurance value that is captured in stock markets (Ducassy, 2013; Oikonomou, Brooks, & Pavelin, 2012).

In recent decades, CSR has gained worldwide attention in various industries. The scholarly definition of CSR approaches is relatively broad, and it is commonly understood as the methods by which companies integrate social, environmental, and stakeholder concerns in their business operations (European Commission, 2011). The

development of CSR involves high levels of attention not only to conducting CSR activities but also to maximizing shareholder value, which has always been the primary goal of corporations (Friedman, 1970). In addition, increasing numbers of firms engage in CSR activities because of the benefits of implementing the approach. Particularly since the 2007-2008 global financial crisis, increasing numbers of companies have begun to treat CSR as one of their corporate missions and have actively put CSR into action (Giannarakis & Theotokas, 2011). These companies are engaged in CSR activities for the insurance-like effect they have, because conducting responsible and ethical actions in the core business can help companies to re-establish trust between themselves and their stakeholders (Thomé, 2009). Furthermore, the results of many empirical studies indicate that, through these insurance-like effects, CSR can create value for stakeholders when they are faced with specific types of negative events (Godfrey, Merrill, & Hansen, 2009; Shiu & Yang, 2017).

To elucidate the importance of CSR performance to business, several empirical studies investigate the relationship between CSR and firm performance. For example, Kang, Germann, and Grewal (2016) suggest that firms gain financial benefits from engaging in CSR activities. Nguyen, Kecskés, and Mansi (2020) point out that CSR activities can enhance the value to shareholders, since managers are well supervised by long-term investors. However, other recent studies argue against the existence of a positive relationship between financial performance and involvement in CSR activities. For instance, Barnea and Rubin (2010) assert that CSR can create a conflict between different shareholders, a finding which is opposite to those of most studies on this topic. Likewise, Lin, Wang, and Wu (2017) indicate that CSR activities do not contribute to predictions of future earnings, implying that CSR does not help to boost future earnings. Due to these obviously inconsistent findings, this issue leaves considerable room for discussion.

CSR scholars, in investigating the concept of corporate social performance, have often focused on developed markets, such as North America and Europe; the notion has only recently been advocated in Taiwan and other emerging markets. For example, according to statistics from the Taiwan Stock Exchange, in 2016 a total of 439 listed companies released CSR reports to the Public Information Observatory, up from only 212 listed companies in 2013; therefore, it can be observed that CSR is gradually gaining ground in Taiwan. Because CSR is gradually being valued in terms of corporate governance, it is unclear what the relationship is between CSR and firm performance, and thus, a study into whether CSR can play a protective role during crises for firms in Taiwan – while it is in the early stages of CSR development – is warranted.

The purpose of this study is to empirically examine whether firms in Taiwan with a good level of CSR performance can generate an insurance value that helps them reduce the impacts of crises, as well as to verify the value of CSR involvement. To test whether a financial crisis has a widespread impact on a large number of companies, the financial crisis of 2007-2008 was selected as the study period. In that time, Taiwan was in the initial stages of CSR implementation so that the advertising effects of CSR activities are still weak and CSR's insurance value can be highlighted. To measure CSR performance, this study makes use of data from an independent international CSR valuation institution, MSCI, to compile CSR indicators. Additionally, stock returns are used to measure firm performance, and the study provides a measurement method by which to evaluate CSR performance and the environmental information related to CSR activities. Also, when compiling the CSR indicators, this study adopts the items relevant to the situation in Taiwan.

Using an empirical method, the results demonstrate that a standard deviation increase in CSR performance during the crisis period would result in approximately a 3.18% increase in stock returns. Therefore, it can be concluded that CSR does indeed play a protective role that reduces drops in stock returns for firms during a crisis period. This finding will encourage managers to invest in CSR activities, not only to fulfil their social responsibilities but also to make their business more resilient in the face of unexpected crises.

This paper is structured as follows: Section 2 provides a review of the literature and the proxy details and develops the hypotheses. In Section 3, the methodology is described as well as the data collection procedures, and a

summary of the descriptive statistics is provided. Section 4 provides a discussion of whether high CSR involvement had a positive impact on stock returns during the examined crisis period. Finally, Section 5 provides the conclusions and suggestions for future research.

2. LITERATURE REVIEW AND HYPOTHESIS DEVELOPMENT

2.1. Corporate Social Responsibility

The modern concept of CSR has been advocated for more than six decades. To date, however, there are still no clear terms to define this idea among academics, businesses, and society. Howard Bowen, the 'father of corporate social responsibility,' in the mid-twentieth century established an initial definition of the social responsibilities of businessmen: "It refers to the obligations of businessmen to pursue those policies, to make those decisions, or to follow those lines of action which are desirable in terms of the objectives and values of our society" (Bowen, 2013). Davis (1960) and Carroll (1999) extended the understanding of CSR and argued that, despite social responsibility being an unclear idea, it should be realized in a managerial practice. Davis (1960) also introduced his now-famous 'Iron Law of Responsibility': "the social responsibilities of businessmen need to be commensurate with their social power," and became well known for his contribution to an early definition of CSR.

Today, CSR has become an important general discipline and is often discussed in terms of business operations. The United Nations Industrial Development Organization (n.d) describes CSR as "a management concept whereby companies integrate social and environmental concerns in their business operations and interactions with their stakeholders." Furthermore, the current European CSR Policy indicates that "CSR is the responsibility of enterprises for their impact on society" (European Commission, n.d). These definitions emphasize that enterprises should integrate social, environmental, ethical, and human rights concerns into the core strategies related to their business operations, in collaboration with their stakeholders. In Taiwan, the Taiwan Stock Exchange Corporate Governance Center refers to CSR as a concept which implies that enterprises should take responsibility for achieving economic prosperity, social welfare, and environmental sustainability when creating profits for shareholders and addressing stakeholders' interests. Overall, although there is no single globally accepted definition, the current definitions all highlight the idea that firms must consider not only governance but also the environment and society, apart from their goal of maximizing shareholder wealth.

2.2. Relationship between Corporate Social Responsibility and Firm Performance

To clarify the importance of CSR in business operations, the relationship between CSR and firm performance is a matter of continuing debate by scholars. From a positive perspective, some findings show that firms that engage in CSR activities create significant firm value and enhance their company's reputation in terms of board leadership, board independence, and antitakeover provisions, more than they enhance community relations and highlight environmental concerns (Jo & Harjoto, 2011; Margolis, Elfenbein, & Walsh, 2009). Other studies have directly examined how CSR investment affects firms' cost of capital, and the results show that investment in CSR activities actually enhances firm value by reducing cost of equity (Dhaliwal, Li, Tsang, & Yang, 2011; El Ghoul, Guedhami, Kwok, & Mishra, 2011; Peipei, Yuqin, & Qishui, 2019). Lev, Petrovits, and Radhakrishnan (2010) point out that CSR activities enhance future revenue growth. Also, in emerging markets, engaging in CSR activities positively affects a firm's performance because of the greater sustainable competitive advantage (Khan, Yang, & Waheed, 2019), higher levels of investor attention (Hou, 2019), higher levels of customer satisfaction and improved corporate image (Ali, Danish, & Asrar-ul-Haq, 2020). In general, an obviously positive correlation can be observed between CSR and firm performance.

On the other hand, other studies claim that a strong performance in terms of CSR consumes firm resources without leading to appropriate rewards and benefits, especially in the case of emerging markets. For instance, one CSR study found a significantly negative correlation between CSR and firm value in Brazilian firms (Lima, De

Souza, & Cortes, 2011). Similarly, socially responsible activities may not add to firm value in Turkish markets (Akben & Kiyamaz, 2017). The findings of Akben and Kiyamaz (2017) suggest that Turkish firms that reveal more information about CSR activities in their annual reports display a lower return on assets. From the mixed results of previous studies, CSR practices in developing countries tend to be in conflict with shareholder interests, which differs from most of the results found for developed countries.

However, the question remains as to whether CSR has any other role other than that of reputation. Several studies, therefore, have investigated the protective role of CSR. Orlitzky and Benjamin (2001) performed a meta-analytical review of 1,200 international business journal articles in the U.S. (from the years 1970 to 2001) and concluded that higher corporate social performance of a firm leads to lower financial risk. Likewise, Ducassy (2013) discovered that good corporate social performance appears to reassure shareholders, particularly during periods of uncertainty. In terms of market performance, CSR indeed plays a protective role for stock prices when there is a negative earnings announcement (Chih, Miao, & Chuang, 2014). Klein and Dawar (2004) suggest that, although positive CSR associations do not immediately increase profitability, they may decrease the risk of damage during adverse events. To put it differently, CSR acts as a powerful reputation insurance instrument when a firm suffers from trust risks (Du, Bhattacharya, & Sen, 2010; Minor & Morgan, 2011). The existing research has additionally shown that the expectations and attitudes towards CSR vary considerable across different industries (Williams & Aguilera, 2008), especially in the case of firms whose reputation is a key source of competitive advantage or in those industries that play a greater role in creating pollution or exhausting environmental resources. Furthermore, the benefits of CSR disclosure may be different based on the particular type of company and the risks involved. For example, Pelozo (2006) demonstrated that industrial firms are more likely to be viewed as using CSR as a cover for current business practices. Based on data from Chinese A-share firms between 2008 and 2015, Xu, Chen, Li, and Xia (2020) discovered that state-owned enterprises benefit from mandatory CSR disclosures when faced with negative news or litigation while privately-owned enterprises benefit from voluntary CSR disclosures when they face negative economic risks. Thus, investment in CSR activities is not only a good deed at the societal level but also good strategic management at the firm level (Galbreath, 2009).

2.3. Hypothesis Development

According to the aforementioned literature, firm-specific social capital can be viewed as an insurance strategy that will pay off when stakeholders – and the entire economy – are faced with a serious crisis of trust (Lins et al., 2017) and CSR activities may contribute to this protective action. This study accordingly argues that firms with more CSR investments will be perceived as more trustworthy, in cases where shareholders may place a premium on high CSR investments during a widespread trust crisis. Although the topic of CSR has long been deliberated from various perspectives in developed countries, such as those in Europe and North America, it is only in recent years that it has been advocated in Taiwan and other emerging markets. There is also less evidence regarding whether CSR activities complement or conflict with firms' objectives in emerging markets. Therefore, the following research hypothesis will be used to address this issue:

Hypothesis: CSR activities have a positive insurance effect, as demonstrated by firm stock performance during the crisis period.

3. METHODOLOGY

3.1. Sample Construction

This study examines the impact of CSR activities on firm performance in Taiwan during the period of the financial crisis. To construct the sample pool, the firm information is obtained from the Market Observation Post System, and the accounting data is collected from the Taiwan Economic Journal (TEJ) Database. Most CSR-related studies use data from the MSCI ESG database, which was previously known as the KLD STATS and was created

by KLD Research & Analytics, Inc.¹ The MSCI ESG database is an annually accumulated data set of environmental, social, and governance (ESG) performance indicators for publicly traded firms worldwide and is one of the longest continuous ESG data sets available. The MSCI Taiwan ESG Index was launched in 2013, and includes 49 Taiwanese companies in its assessment. This sample size, however, is too small for the present study, and the data prior to the launch date is back tested. To overcome this problem, this study uses the ESG Ratings Methodology announced by the MSCI to compile the CSR indicators. The details of the processing method are discussed in Section 3.2.2.

For the purposes of this study, the financial crisis is defined as the period from August 2008 to January 2009, in reference to the work of Lins et al. (2017). A starting date of August 2008 is used to predate the Lehman Brothers bankruptcy in September 2008, while January 2009 is used because in that month the TAIEX hit its lowest point of the 2008-2009 financial crisis. Following prior literature (Lins et al., 2017), the CSR indicators are based on the data at 2006 year-end, because CSR will not immediately display protective effects on firms. It is important to note that the financial firms are removed from the sample pool because these firms' characteristics differ from those of other industries; micro-capitalization stocks are also removed (those with market capitalization below 2,000 million dollars in NTD) because micro-capitalization firms typically display low liquidity and high bid-ask spreads. In addition, they may not have enough resources or environmental awareness to invest in CSR activities, especially in the early stages of CSR development.

After excluding financial and micro-capitalization firms, firms with insufficient data in the TEJ database during the study period are also removed from the sample pool. Ultimately, a sample of 514 firms for which all relevant variables are available during the sample period is obtained.

3.2. Regression Variables

3.2.1. Returns Measurement

The stock returns for each firm are divided into two parts, the first of which is the raw-returns in the crisis period, which consists of the stock's buy-and-hold returns from August 2008 to January 2009, and the other is abnormal-returns in the same period, which are the raw returns minus the expected returns, based on the Capital Asset Pricing Model (CAPM) estimated over the 60-month period ending in July 2008.

3.2.2. Corporate Social Responsibility Indicators

The main challenge for CSR studies in Taiwan is that they lack standard measurements. Most studies in the CSR field use the data from the MSCI ESG database, which only evaluates a small number of Taiwanese listed companies; hence, this study follows the MSCI ESG Key Issue Hierarchy² (MSCI, 2015) which is published by the MSCI and outlines the 3 pillars and 10 themes that can be used to identify and assess 37 key ESG issues (see Table 1). Furthermore, it is used to compile CSR metrics and to evaluate the CSR performance for each firm using 7 indicators. For reliable and consistent results, the accounting data obtained from the TEJ Database and the environmental information disclosed on the firms' annual reports are used in the present study.

The three pillars of CSR include the environment, society, and governance. From the environmental perspective, which considers the effects on climate change, natural resources, pollution and waste, and environmental opportunities, the level of environmental information disclosed in annual reports is used as the measure, since the research period of this study falls within the early stages of environmental accounting, and CSR information is not yet widely disclosed in the listed firms. On the other hand, Eljido-Ten (2004) also suggests that

¹The MSCI ESG KLD STATS DATA SET was created by KLD Research & Analytics, Inc. (KLD) in 1991. MSCI acquired KLD in 2010.

² MSCI ESG Ratings research aims to help investors identify the key environmental, social, and governance (ESG) opportunities and risks, to evaluate how well a firm manages key opportunities and risks, and compare those risks relative to global industry peers. For more information, see: <https://www.msci.com/esg-ratings>.

firms are willing to disclose more environmental information in order to improve their corporate image and address social responsibility.

From the social perspective – which includes considerations of human capital, product liabilities, stakeholder opposition, and social opportunities – salaries and benefit expenses, research and development expenses, purchase expenses, and credit ratings are used to score the themes. The credit rating data is obtained from the Taiwan Corporate Credit Risk Index (TCRI), which is compiled by the TEJ. Finally, from the perspective of governance, the themes relating to corporate governance and corporate behavior are considered, where return on equity is used to measure corporate governance abilities and the information disclosed is used to measure corporate behavior.

Then, following the scoring method outlined below, each variable is first arranged by its score, giving 0.1 points for those below the 10th percentile, 0.2 points for those within the 11th to 20th percentile, and so on. Accordingly, each of the seven defined measurements ranged from 0.1-1. Because CSR development in Taiwan was in its early stages during 2006, equal weight is given to all three pillars. To obtain the CSR metrics, all indicators in the three environmental, society, and governance pillars are combined, and the average scores of each pillar are added together. The CSR metrics thus range from 0.3 to 3. The computations used for each criterion are given below:

(1) Environmental Information Disclosed (EVN)

Each firm's environmental information is manually collected from its 2006 and 2007 annual reports. A content analysis is used to score the level of environmental disclosure (Patten, 1991; Weng & Hsiao, 2008; Wiseman, 1982), with reference to the grading policies of Wiseman (1982) and Aerts, Cormier, and Magnan (2006). The environmental information in the annual reports is presented in varying degrees of detail in the form of quantities or currency in each year, including details describing investment in environmental protection equipment or process improvements for the purpose of pollution prevention, as well as the effectiveness of environmental protection policies. Three points are given if detailed information is disclosed. If the information concerns company-specific practices, such as replaced equipment intended to reduce pollution, actively integrating green policy into operations, and acquiring an international green business certificate, without disclosing quantities or monetary numbers, 2 points are given. Additionally, firms revealing a penalty paid for pollution events and monetary amounts of future investments in improvements also receive only 2 points because this only represents future investments rather than current environmental protection practices. Furthermore, if firms only reveal the total amount of environmental expenditure to date without a detailed description of use in the current year, they also receive 2 points. Environmental information mentioned only in general terms is awarded 1 point, and firms that do not disclose any environmental information in their annual report are scored 0. After grading each firm, they are arranged according to the scoring method mentioned above.

(2) Salaries and Benefit Expenses (SW)

$$SW = \text{Score} \left(\frac{\text{Salaries and Wages Expenses} + \text{Benefit Expenses}}{\text{Sales}} \right)$$

(3) Research and Development Expenses (RD)

$$RD = \text{Score} \left(\frac{\text{Research and Development Expenses}}{\text{Sales}} \right)$$

Table-1. ESG key issues hierarchy.

3 Pillars	10 Themes	37 ESG Key Issues		Corresponding Indicators
Environment	Climate Change	Carbon Emissions Product Carbon Footprint	Financing Environmental Impact Climate Change Vulnerability	Environmental Information Disclosed
	Pollution & Waste	Water Stress Biodiversity & Land Use	Raw Material Sourcing	
	Environmental Opportunities	Toxic Emissions and Waste Packaging Material and Waste	Electronic Waste	
	Natural Resources	Opportunities in Clean Tech Opportunities in Green Building	Opportunities in Renewable Energy	
Society	Human Capital	Labor Management Health & Safety	Human Capital Development Supply Chain Labor Standards	Salaries and Benefit Expenses
	Product Liabilities	Product Safety & Quality Chemical Safety Financial Product Safety	Privacy & Data Security Responsible Investment Health & Demographic Risk	Research and Development Expenses
	Stakeholder Opposition	Controversial Sourcing		Annual Purchase
	Social Opportunities	Access to Communications Access to Finance	Access to Health Care Opportunities in Nutrition & Health	Credit Risk Index
Governance	Corporate Governance	Board Pay	Ownership Accounting	Return on Equity
	Corporate Behavior	Business Ethics Anti-Competitive Practices Tax Transparency	Corruption and Instability Financial System Instability	Information Disclosed

Source: MSCI (2015).

(4) Suppliers Purchases (SUP)

$$SUP = \text{Score} \left(\frac{\text{Annual Purchases}}{\text{Sales}} \right)$$

(5) Credit Risk (CRE)

The credit risk rating in this study follows the TCRI, as graded by the TEJ. In the TCRI grading policy, a higher score indicates a higher credit risk, which is inconsistent with the methodology of this study. Therefore, this study uses 10 points minus the TCRI score to calculate a firm's credit risk score, to ensure a consistent relationship in which a higher credit risk score means lower credit risk, resulting in higher CSR. After obtaining the credit risk scores, they are incorporated into the scoring method mentioned above.

(6) Return on Equity (ROE)

$$ROE = \text{Score} \left(\frac{\text{Net Incomes}}{\text{Equities}} \right)$$

(7) Information Disclosed (INF)

The information disclosure ratings in this study are based on an appraisal of the information disclosed, as graded by the TEJ Database, which uses A+, A, B, C, and D-levels to record the evaluation result. For the purposes of this study, these five levels are converted numerically into 5, 4, 3, 2, and 1 point respectively. When the TEJ database indicates that a firm is unwilling to permit an information disclosure evaluation, the firm is scored 0 points. After obtaining the information disclosure scores, the scoring method mentioned previously is implemented.

3.2.3. Control Variables

In accordance with the previous literature (Lins et al., 2017), financial health and firm characteristics are controlled for to make it possible to specifically explain the relationship between stock returns and the main explanatory variable. First, corporate financial health is controlled in the year before the crisis, specifically controlling for the following indices: CashHoldings (cash and marketable securities divided by total assets), LongTerm Debts (long-term debts divided by total assets), ShortTerm Debts (short-term debts divided by total assets), and Profitability (operating income divided by total assets) to measure each firm's financial health and its ability to survive a serious downturn. A profitable firm with a high cash reserve and low debt is better able to mitigate crisis effects and continue its investment activities (Almeida, Campello, Laranjeira, & Weisbenner, 2009; Duchin, Ozbas, & Sensoy, 2010; Fresard, 2010). Secondly, additional firm characteristics that are also important for a firm's stock returns are controlled, including Market Cap. (represented as the natural logarithm of market capitalization in million dollars), Book to Market (calculated as the book value of equities divided by the market value of equities), and Momentum (the firm's accumulated raw return over the past 12 months). Third, to accurately capture fluctuations in stock prices, idiosyncratic risk based on the three-factor model of Fama-French is controlled, including a momentum factor. Finally, industry dummies (referring to the TSE industry categories) are included for the purpose of controlling for industry-fixed effects – some manufacturing industries may have put more overall effort into investing in CSR than others, and the impacts of the crisis on different industries will also vary (Lins et al., 2017).

3.3. Models

First, the study's main research objective is to determine whether higher CSR performance before the financial crisis is positively associated with higher stock returns of firms during the crisis, which would imply that CSR activities create insurance value for companies. To answer this question, the crisis-raw and crisis-abnormal returns against the CSR metrics are used to construct the model, while also controlling for financial health, firm characteristics, and industry fixed effects. The empirical model is constructed as follows:

Model 1.1: Raw Returns_{*i,crisis-period*}

$$\begin{aligned}
 &= b_0 + b_1 CSR_{i,2006} + b_2 LongTerm\ Debts_{i,2007} + b_3 ShortTerm\ Debts_{i,2007} \\
 &+ b_4 CashHoldings_{i,2007} + b_5 Profitability_{i,2007} + b_6 Ln(Market\ Cap.)_{i,2007} \\
 &+ b_7 Book\ to\ Market_{i,2007} + b_8 Momentums_i + b_9 Idiosyncratic\ Risk_i \\
 &+ Industry\ Fixed\ Effects + e_{i,t}
 \end{aligned}$$

Model 1.2: Abnormal Returns_{*i,crisis-period*}

$$\begin{aligned}
 &= b_0 + b_1 CSR_{i,2006} + b_2 LongTerm\ Debts_{i,2007} + b_3 ShortTerm\ Debts_{i,2007} \\
 &+ b_4 CashHoldings_{i,2007} + b_5 Profitability_{i,2007} + b_6 Ln(Market\ Cap.)_{i,2007} \\
 &+ b_7 Book\ to\ Market_{i,2007} + b_8 Momentums_i + b_9 Idiosyncratic\ Risk_i \\
 &+ Industry\ Fixed\ Effects + e_{i,t}
 \end{aligned}$$

To more closely examine the positive relationship between CSR activities and stock returns to determine whether it is unique to the crisis period or has existed in general outside the crisis, the interactive dummies are added to discuss the interaction effect of CSR and the financial crisis, including industry fixed effects. A panel of crisis-period returns is constructed for the period from August 2008 to January 2009, and the post-crisis-period returns during the same period in the post-crisis year (from August 2009 to January 2010) are also examined for all the firms in the samples.

Model 2. 1: Raw Returns $_{i,t}$

$$= b_0 + b_1 CSR_{i,t-2} \times Crisis_t + b_2 CSR_{i,t-2} + b_3 Crisis_t + b_4 LongTerm\ Debts_{i,t-1} + b_5 ShortTerm\ Debts_{i,t-1} + b_6 CashHoldings_{i,t-1} + b_7 Profitability_{i,t-1} + b_8 Ln(Market\ Cap.)_{i,t-1} + b_9 Book\ to\ Market_{i,t-1} + b_{10} Momentums_{i,t} + b_{11} Idiosyncratic\ Risk_{i,t} + Industry\ Fixed\ Effects + e_{i,t}$$

Model 2. 2: Abnormal Returns $_{i,t}$

$$= b_0 + b_1 CSR_{i,t-2} \times Crisis_t + b_2 CSR_{i,t-2} + b_3 Crisis_t + b_4 LongTerm\ Debts_{i,t-1} + b_5 ShortTerm\ Debts_{i,t-1} + b_6 CashHoldings_{i,t-1} + b_7 Profitability_{i,t-1} + b_8 Ln(Market\ Cap.)_{i,t-1} + b_9 Book\ to\ Market_{i,t-1} + b_{10} Momentums_{i,t} + b_{11} Idiosyncratic\ Risk_{i,t} + Industry\ Fixed\ Effects + e_{i,t}$$

3.4. Descriptive Statistics

The results of the descriptive statistics for all variables in the empirical model are listed in Table 2. The first row of Panel A is CSR, the primary variable in this study, which has a mean value of 1.4071 and median of 1.3750. The next two rows show that the raw and abnormal returns are strongly negative during the 2008 financial crisis period. The raw returns display a mean of -0.4034 and a median of -0.4252, and the abnormal returns have a mean of -0.4164 and a median of -0.4303, indicating that the crisis has a negative impact on stock returns. The subsequent rows present the descriptive statistics of the control variables in the models. Furthermore, the Pearson correlation matrix of all variables is listed in Table 3. It demonstrates the existence of a slightly positive relationship between crisis-period returns and CSR performance; additionally, there are no obvious collinearity problems due to low correlation coefficients between all the explanatory variables employed in this study.

The stock returns for each firm are divided into two parts. The first is the raw returns during the crisis period, which are the stock's buy-and-hold returns from August 2008 to January 2009, and the other is the abnormal returns in the same period, calculated as the raw returns minus the expected returns based on the Capital Asset Pricing Model (CAPM) estimated over the 60-month period ending in July 2008. CSR indicator data are obtained from the TEJ database as well as the annual reports of individual firms as of year-end 2006 and 2007. Accounting data relating to the control variables are based on the end of the previous year. Cash Holdings are the cash and marketable securities divided by total assets; Long-Term Debts are long-term debts divided by total assets; Short-Term Debts are short-term debts divided by total assets, and Profitability is the operating income divided by total assets. Market Cap. is represented in million-dollar increments. The Book-to-Market value of equity is computed as the book value of equity divided by the market value of equity, and Momentum is the firm's accumulated raw return over the past 12 months. After excluding financial firms and micro-cap firms, firms with incomplete data were also removed from the sample pool. The data for the crisis period is presented in Panel A; the data for the post-crisis period is presented in Panel B, and the entire set of data from the crisis period to the post-crisis period is shown in Panel C.

Table-2. Descriptive Statistics.

Panel A: Descriptive Statistics for the Crisis Period					
	Mean	SD (Std. Dev)	Min	Median	Max
CSR	1.4071	0.3897	0.4500	1.3750	2.3750
Crisis Raw Returns	-0.4034	0.1464	-0.8462	-0.4252	0.1035
Crisis Abnormal Returns	-0.4164	0.1382	-0.8403	-0.4303	0.1117
Market Cap.	34,753	121,485	2,015	7,617	1,638,480
LongTerm Debts	0.0763	0.0898	0.0000	0.0446	0.4648
ShortTerm Debts	0.3119	0.1492	0.0075	0.2983	0.8355
CashHoldings	0.1395	0.1179	0.0053	0.1174	0.7601
Profitability	0.0790	0.0786	-0.2991	0.0672	0.4837
Book to Market	0.7558	0.4171	0.0913	0.6746	3.0313
Momentum	-0.2967	0.2724	-0.8332	-0.3432	1.0505
Idiosyncratic Risk	0.0119	0.0119	0.0010	0.0089	0.1710
Observations	514				

Note: CSR measurements are obtained from the TEJ database and the annual reports for individual firms as of year-end 2006. Accounting data for the control variables are based on the end of 2007.

Panel B: Descriptive Statistics for the Post-Crisis Period					
	Mean	SD (Std. Dev)	Min	Median	Max
CSR	1.3985	0.3881	0.4000	1.3750	2.4750
Post-Crisis Raw Returns	0.1796	0.2886	-0.4589	0.1163	1.9867
Post-Crisis Abnormal Returns	0.1338	0.2789	-0.4816	0.0742	1.8893
Market Cap.	18,605	73,928	421	3,741	1,137,769
LongTerm Debts	0.0820	0.0986	0.0000	0.0451	0.5223
ShortTerm Debts	0.3090	0.1485	0.0064	0.2970	0.7652
CashHoldings	0.1522	0.1213	0.0014	0.1204	0.7340
Profitability	0.0449	0.0803	-0.3327	0.0410	0.3384
Book to Market	1.4908	0.8988	0.1362	1.3041	10.2115
Momentum	0.1251	0.3633	-0.7267	0.0566	2.8091
Idiosyncratic Risk	0.0168	0.0132	0.0010	0.0132	0.1801
Observations	514				

Note: CSR measurements are obtained from the TEJ database, as well as the annual reports for individual firms as of year-end 2007. Accounting data for the control variables are based on the end of 2008.

Panel C: Summary Statistics for Model 2					
	Mean	SD (Std. Dev)	Min	Median	Max
CSR	1.4028	0.3887	0.4000	1.3750	2.4750
Crisis-Raw Returns	-0.1119	0.3706	-0.8462	-0.1499	1.9868
Crisis-Abnormal Returns	-0.1413	0.3523	-0.8403	-0.1878	1.8892
Market Cap.	26,679	100,834	421	5,511	1,638,480
LongTerm Debts	0.0792	0.0943	0.0000	0.0449	0.5223
ShortTerm Debts	0.3104	0.1488	0.0064	0.2976	0.8355
CashHoldings	0.1459	0.1197	0.0014	0.1152	0.7601
Profitability	0.0619	0.0812	-0.3327	0.0533	0.4837
Book to Market	1.1233	0.7909	0.0913	0.9357	10.2115
Momentum	-0.0858	0.3841	-0.8332	-0.1244	2.8091
Idiosyncratic Risk	0.0144	0.0140	0.0010	0.0111	0.1801
Observations	1,028				

Note: CSR measurements are obtained from the TEJ database as well as the annual reports for individual firms as of year-end 2006 and 2007. Accounting data for the control variables are based on the end of 2007 and 2008.

Table-3. Pearson Correlation Matrix.

The data for the crisis period is presented in Panel A; the data for post-crisis period is presented in Panel B; all data for the crisis period to the post-crisis period is shown in Panel C.

Panel A: Correlation Coefficients for the Variables in the Crisis Period

	CSR	Crisis Raw Returns	Crisis Abnormal Returns	LN (Market Cap.)	Long Term Debts	Short Term Debts	Cash Holdings	Profitability	Book to Market	Momentum
Crisis-Raw Returns	0.083*									
Crisis-Abnormal Returns	0.092**	0.990***								
LN(Mkt Cap.)	0.424***	-0.052	-0.009							
LongTerm Debts	-0.011	-0.093**	-0.081*	0.131***						
ShortTerm Debts	-0.192***	-0.109**	-0.111**	-0.069	-0.057					
CashHoldings	0.087**	0.0600	0.066	0.070	-0.266***	-0.179***				
Profitability	0.260***	-0.035	-0.043	0.255***	-0.259***	-0.127***	0.440***			
Book to Market	-0.203***	0.076*	0.089*	-0.291***	0.182***	-0.023	-0.330***	-0.584***		
Momentum	0.060	0.096**	0.067	0.214	0.115***	-0.046	-0.190***	0.099**	0.015	
Idiosyncratic Risk	-0.208***	-0.215***	-0.201***	-0.117***	-0.104**	0.046	0.147***	0.107**	-0.184***	-0.199***

Note: The table represents the Pearson correlation coefficients for all variables in Model 1. ***, ** and * indicate that the parameter estimate is at the 1%, 5%, and 10% significance level, respectively.

Panel B: Correlation Coefficients for the Variables in the Post-Crisis Period

	CSR	Crisis Raw Returns	Crisis Abnormal Returns	LN (Market Cap.)	Long Term Debts	Short Term Debts	Cash Holdings	Profitability	Book to Market	Momentum
Crisis-Raw Returns	-0.080*									
Crisis- Abnormal Returns	-0.080*	0.999***								
LN(Mkt Cap.)	0.456***	-0.295***	-0.293***							
LongTerm Debts	0.092**	-0.008	0.008	0.170***						
ShortTerm Debts	-0.184***	0.087**	0.088**	0.075*	-0.055					
CashHoldings	0.140**	-0.019	0.019	0.024	-0.248***	-0.234***				
Profitability	0.277***	-0.069	-0.071	0.244***	-0.175***	-0.154***	0.356***			
Book to Market	-0.212***	0.226***	0.227***	-0.342***	0.167***	0.074*	-0.208***	-0.471***		
Momentum	0.089**	-0.123**	-0.122***	-0.073*	-0.179***	0.053	0.054	-0.005	-0.015	
Idiosyncratic Risk	-0.263***	-0.047	-0.044	-0.226***	-0.086*	0.059	0.044	-0.114***	-0.073*	0.271***

Note: The table represents the Pearson correlation coefficients for all variables in Model 1. ***, ** and * indicate that the parameter estimate is at the 1%, 5%, and 10% significance level, respectively.

Panel C: Correlation Coefficients for the Variables in Model 2										
	CSR	Crisis Raw Returns	Crisis Abnormal Returns	LN (Market Cap.)	LongTerm Debts	ShortTerm Debts	CashHoldings	Profitability	Book to Market	Momentum
Crisis-Raw Returns	-0.023									
Crisis- Abnormal Returns	-0.022	0.999***								
LN(Mkt Cap.)	0.424***	-0.337***	-0.328							
LongTerm Debts	0.426***	0.010	0.012	0.137***						
ShortTerm Debts	-0.188***	0.005	0.005	-0.069**	-0.056*					
CashHoldings	0.113***	0.045	0.047	0.030	-0.254***	-0.206***				
Profitability	0.265***	-0.198	-0.200	0.292***	-0.259***	-0.136***	0.372***			
Book to Market	-0.179***	0.473***	0.474***	-0.389***	0.159***	0.032	-0.180***	-0.511***		
Momentum	-0.027	0.400**	0.393***	0.112	0.033	0.004	-0.011	-0.084***	0.249***	
Idiosyncratic Risk	-0.235***	0.079**	0.081***	-0.214***	-0.087***	0.050	0.099***	-0.048	0.079**	0.165***

Note: The table represents the Pearson correlation coefficients for all variables in Model 1. ***, ** and * indicate that the parameter estimate is at the 1%, 5%, and 10% significance level, respectively.

4. EMPIRICAL RESULTS

4.1. Baseline Results

To explain the impact of CSR on stock returns, various regression models are constructed of crisis-raw and crisis-abnormal returns with CSR indicators and control variables during the 2008 financial crisis period. The baseline results are shown in Table 4. In columns (1) and (3), the raw returns in the crisis period are employed as the dependent variable, and in columns (2) and (4), the abnormal returns in the crisis period are used as the dependent variable to examine the impact of CSR. In all the models, the industry-fixed effects are controlled by the TSE Industry Category numbers. In the first two columns of Table 4, they show that firms with higher CSR scores performed significantly better during the crisis period. The economic effect of CSR on firm stock returns is that when a firm's CSR scores is increased by one standard deviation (0.3897), this leads to about a 1.34% increase in raw returns and a 1.38% increase in abnormal returns beyond that period.

Table-4. Crisis-Period Returns and CSR.

Model 1: Result of Raw and Abnormal Returns				
	Raw Returns (1)	Abnormal Returns (2)	Raw Returns (3)	Abnormal Returns (4)
CSR	0.0343** (0.0171)	0.0353** (0.0164)	0.0478** (0.0192)	0.0442** (0.0184)
LN(Market Cap.)			-0.0083 (0.0059)	-0.0015 (0.0057)
LongTerm Debts			-0.2555*** (0.0781)	-0.2398*** (0.0747)
ShortTerm Debts			0.0493 (0.0491)	0.0482 (0.0470)
CashHoldings			0.1794*** (0.0647)	0.1805*** (0.0620)
Profitability			-0.0699 (0.1043)	-0.0764 (0.0998)
Book to Market			0.0352 (0.0196)	0.0449** (0.0187)
Momentum			-0.0029 (0.0275)	-0.0174 (0.0263)
Idiosyncratic Risk			-1.7026*** (0.5077)	-1.5049*** (0.4858)
Intercept	-0.4138*** (0.0579)	-0.4203*** (0.0553)	-0.3705*** (0.0825)	-0.4516*** (0.0789)
Industry Fixed Effects	Yes	Yes	Yes	Yes
Adj. R ²	0.1322	0.1102	0.1871	0.1650
Observations	514	514	514	514
Mean of VIF	3.5127	3.5127	3.2945	3.2945

Note: The numbers in the parentheses represent the standard errors of the estimated coefficients in Model 2. ***, ** and * indicate that the parameter estimate is at a 1%, 5%, and 10% significance level, respectively.

Furthermore, to explain this relationship in more detail, several control variables reflecting the financial health and characteristics of firms are additionally employed in Model 2 of this study. Thus, columns (3) and (4) show that firms with higher CSR scores performed significantly better during the crisis period. When a firm's CSR score is increased by one standard deviation (0.3897), this causes about a 1.86% increase in raw returns and a 1.72% increase in abnormal returns during the study period. As for the control variables reflecting financial health, the empirical results in columns (3) and (4) show that firms with higher cash holdings and lower long-term debts have higher crisis-period stock returns, which is in line with the findings of the previous literature (Almeida et al., 2009; Duchin et al., 2010; Fresard, 2010). Regarding cash holdings, a standard deviation (0.1179) increase is associated with a 2.12% increase in raw returns and a 2.13% increase in abnormal returns. When long-term debts increase by one standard deviation (0.0898), this causes about a 2.29% and a 2.15% decrease in raw and abnormal returns

respectively, during the crisis period. However, there is insufficient evidence to suggest that firm profitability has a positive effect on stock returns in either of the models, where the coefficients are inconsistent with expectations. In terms of idiosyncratic risk, there is a significantly negative impact on stock returns during the crisis period, which means that firms with higher idiosyncratic risk have lower stock returns. One standard deviation of idiosyncratic risk (0.0119) increase is associated with a 2.03% decrease in raw returns and a 1.79% decrease in abnormal returns. The empirical results in Table 4 are consistent with the Hypothesis, demonstrating that there is a clearly positive relationship between higher levels of CSR performance and higher stock returns for firms during the crisis period.

4.2. Comparing Returns in the Crisis and Post-Crisis periods

In this section, the positive relationship between CSR activities and stock returns is examined more closely to determine whether it is specific to the crisis period or is a normal feature during general periods. To answer this question, the interactive crisis dummy is added to Model 2, along with the control variables and industry-fixed effects. A panel of crisis-period returns (from August 2008 to January 2009) and post-crisis period returns covering the same period in the post-crisis year (from August 2009 to January 2010) were used for all firms in our sample. The crisis dummy variable is set to one in the period from August 2008 to January 2009, and is zero otherwise.

Table-5. Insurance Effect of CSR in the Crisis Period.

Model 2: Result of Raw and Abnormal Returns		
	Raw Returns (1)	Abnormal Returns (2)
CSR × CRISIS	0.0816** (0.0351)	0.0815** (0.0339)
CSR	-0.0279 (0.0288)	-0.0302 (0.0278)
CRISIS	-0.6530*** (0.0539)	-0.6218*** (0.0520)
LN (Market Cap.)	-0.0319*** (0.0067)	-0.0274*** (0.0065)
LongTerm Debts	-0.0134 (0.0855)	-0.0129 (0.0824)
ShortTerm Debts	0.0245 (0.0565)	0.0234 (0.0545)
CashHoldings	-0.0313 (0.0735)	-0.0267 (0.0709)
Profitability	0.1415 (0.1089)	0.1217 (0.1051)
Book to Market	0.0630*** (0.0119)	0.0626*** (0.0115)
Momentum	-0.0268 (0.0220)	-0.0313 (0.0212)
Idiosyncratic Risk	-1.6465*** (0.5478)	-1.5180*** (0.5283)
Intercept	0.3327*** (0.0939)	0.2569*** (0.0905)
Industry Fixed Effects	Yes	Yes
Adj. R ²	0.6600	0.6501
Observations	1028	1028
Mean of VIF	3.9269	3.9270

Note: The numbers in parentheses represent the standard errors of the estimated coefficients in Model 2. ***, ** and * indicate that the parameter estimate is at a 1%, 5%, and 10% significance level, respectively.

The results for both the raw and abnormal returns are presented in Table 5. The coefficients of the interaction term, CSR × Crisis, are 0.0816 and 0.0815, which means that a standard deviation increase in CSR (0.3897) performance during the crisis period causes approximately a 3.18% increase in the raw and abnormal stock returns;

however, the individual CSR term is insignificant. In short, the results are consistent with the expectation Hypothesis 2, which posits that firms with better CSR performance experienced a significantly positive impact on stock returns during the crisis period, while there is insufficient evidence to prove this positive relationship between CSR and returns in the year after the crisis. By integrating the above-mentioned results, the significantly positive relationship between CSR and stock performance is empirically shown to exist in the crisis period, where the CSR performance of a firm demonstrably plays a protective role when firms face a widespread trust crisis.

4.3. Further Test of the CSR Insurance Effect

In the above results, the method developed by Lins et al. (2017) is followed, which uses CSR data from the 2006 year-end; however, since Taiwan was in the early stages of CSR development, there was a need to determine how long the cumulative effects of CSR can play a role. To address this question, further tests are conducted that focus on measuring the CSR indicators at the year-end of the previous year, instead of the 2006 year-end, to examine the insurance effects of CSR during the crisis period. The returns data and other control variables are shown in Table 6, and the same study periods are used. The empirical model for the further tests is reconstructed as follows:

Model 3: Returns_{i,t}

$$\begin{aligned}
 &= b_0 + b_1 CSR_{i,t-1} \times Crisis_t + b_2 CSR_{i,t-1} + b_3 Crisis_t + b_4 LongTerm Debts_{i,t-1} \\
 &+ b_5 ShortTerm Debts_{i,t-1} + b_6 CashHoldings_{i,t-1} + b_7 Profitability_{i,t-1} \\
 &+ b_8 Ln(Market Cap.)_{i,t-1} + b_9 Book to Market_{i,t-1} + b_{10} Momentums_{i,t} \\
 &+ b_{11} Idiosyncratic Risk_{i,t} + Industry Fixed Effects + e_{i,t}
 \end{aligned}$$

Table-6. Further tests of CSR insurance effects.

Further Tests of CSR Insurance Effects		
	Raw Returns (1)	Abnormal Returns (2)
CSR × CRISIS	0.0736** (0.0314)	0.0730** (0.0303)
CSR	-0.0225 (0.0262)	-0.0248 (0.0253)
CRISIS	-0.6403*** (0.0480)	-0.6107*** (0.0463)
LN (Market Cap.)	-0.0321*** (0.0067)	-0.0275*** (0.0065)
Long-Term Debts	-0.0151 (0.0854)	-0.0147 (0.0824)
Short-Term Debts	0.0281 (0.0563)	0.0273 (0.0543)
Cash-Holdings	-0.0285 (0.0735)	-0.0236 (0.0709)
Profitability	0.1482 (0.1102)	0.1292 (0.1064)
Book-to-Market	0.0630*** (0.0195)	0.0627*** (0.0115)
Momentum	-0.0256 (0.0220)	-0.0299 (0.0212)
Idiosyncratic	-1.6431*** (0.5487)	-1.5154*** (0.5293)
Intercept	0.3262*** (0.0927)	0.2502*** (0.0894)
Industry Fixed Effects	Yes	Yes
Adj. R ²	0.6600	0.6501
Observations	1028	1028
Mean of VIF	3.7530	3.7530

Note: (1) The numbers in parentheses represent the standard errors of the estimated coefficients in Model 1. ***, ** and * indicate that the parameter estimate is at a 1%, 5%, and 10% significance level, respectively. (2) CSR measurements are obtained from the TEJ database and the annual reports of

individual firms as of year-end 2007 and 2008. Accounting data for the control variables are based on the end of 2007 and 2008.

The results of the additional tests are reported in Table 6. The coefficients of the interaction term, $CSR \times Crisis$, are 0.0736 and 0.0730, which are at the same significance level as the results shown in Table 5, meaning that a standard deviation increase in CSR (0.3897) performance during the crisis period causes approximately a 2.87% and a 2.85% increase in the raw and abnormal stock returns, respectively. Similarly, the individual CSR term is insignificant. This outcome further demonstrates that there is insufficient evidence to prove a positive relationship between CSR and returns after the crisis year. Overall, the further tests of the CSR insurance effects are consistent with the results of the previous test, and it can be inferred that, in emerging markets, the time required for CSR investments to play a role in value protection may not be long.

5. CONCLUSION

To overcome the problem of a lack of standard evaluation for an individual firm's CSR performance in Taiwan and other emerging markets, the CSR Index is compiled using the method discussed in Section 3 to evaluate CSR for individual firms. Regarding firm performance, raw and abnormal returns are used to check whether investment in CSR can bring about positive stock returns during a period of crisis. This study uses data from 514 listed companies in Taiwan during the 2008 financial crisis period to answer the research questions by conducting a multiple regression analysis.

The empirical evidence is consistent with the hypothesis positing that investment in CSR before the 2008 financial crisis is associated with positive stock returns during the crisis. Indeed, after examining the in-crisis and post-crisis periods, it is found that CSR does have insurance value for firm stock performance during the crisis period. Although the 2008 financial crisis led to a serious fall in the global stock market overall, firms with high levels of CSR investment exhibited superior performance. From these findings, it can be concluded that CSR plays an insurance role for firms when the market encounters a widespread trust crisis. Additionally, it highlights the importance of firms engaging in an increased adoption of CSR practices, not only for the purpose of improving their firm's reputation but also to obtain insurance value, which will pay off during unexpected negative trust events. CSR investments can thus be viewed as preparation for future crises.

However, there are still two limitations to this study. First, and most importantly, during the study period Taiwan was still in the early stages of CSR development, so the studied firms' CSR activities may not capture the insurance value as expected. Secondly, the regulations for CSR disclosure are still in the stage of initial implementation in Taiwan, so the available information was limited, which may have influenced the accuracy of the final results.

Overall, this study still offers a significant contribution to the CSR research field in the emerging market of Taiwan. First, there is relatively little literature on the impact of CSR investments on corporate financial performance in Taiwan, although CSR is a vital issue. Thus, this study contributes to CSR research by examining whether CSR is value-enhancing for companies. Secondly, the findings of this study provide a new reason for managers and policy makers to encourage investment in CSR activities. The insurance value accumulated by CSR investments does not violate the goal of maximizing shareholder value; however, it does play a protective role in case of potential future crises. Furthermore, Taiwan plays an important role in the world economy. The statistics from the Taiwanese Ministry of Economic Affairs show that, in 2018, the semiconductor industry production value doubled compared to its value in 2008, and the production value of the IC industry was the third in the world. In addition, this study provides a quantitative measurement by which to evaluate CSR performance for individual firms, as well as a quantitative measurement for the evaluation of environmental information related to CSR activities. The proposed method addresses this problem for related studies in Taiwan, which lack consistent CSR metrics, and also provides a method to evaluate firms' environmental efforts. This method is developed in consideration of local circumstances. Moreover, this study provides some ideas for further CSR studies in Taiwan and other emerging markets.

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