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Could Corporate Social Responsibility Act as Insurance for Financial Performance?

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Abstract: *Though empirical research on the relationship between corporate social responsibility (CSR) and financial performance (FP) did exist, there has been inconsistence in whether doing CSR is rewarded by improved performance. Recently, there has been a lack in research on whether the effects of CSR actions are more salient in the economic upturn or downturn although previous research reveals that CSR could act as insurance for performance during abnormal time (such as downturn or firm-specific unexpected negative events) [1]. Based on the data of TWSE-listed companies during 2005Q1~2010Q3, we examine whether CSR firms outperform NonCSR firms during recession via regression analysis. The findings reveal that during upturn, firms with CSR outperform NonCSR firms, whereas during downturn, performance of all firms is decreased. However, the degree of performance superiority of CSR firms, though present, is insignificant during downturn. Therefore, our findings did not support that financial performance can be improved by firms' social responsibility actions during economic downturn.*

Keywords: corporate social responsibility, insurance, upturn, downturn, recession

JEL Classification: M14

1. Introduction

Firms' increasing engagement in corporate social responsibility （CSR） activities may reflect different motives such as altruism, strategic choices and greenwash [2]. The diversification of firms' CSR activity include relieving the demands of nongovernmental organizations (NGOs) to prevent boycott [3], forestalling government's setting stricter regulation [4], signalling the trustworthiness and management to interesting parties [5] or offsetting previous irresponsible behaviors [6]. Engaging in CSR activities is similar to buying insurance in that compensation is received when accidents happen.

However, previous research exploring the relationship between CSR and financial performance (FP) got contradictory results. Favoring stakeholders theory [7], some studies revealed positive relationship [8,9,10]. By contrast, considering that CSR is a misuse of corporate resources, other studies found negative relationship [11,12], proposing no relation or nonlinear relationship [13,14,15,16,17,18,19,20,21].

Though there is incongruous relationship between CSR and FP, more and more executives feel engagement in CSR is important for firms, and more managers are putting firms' resources into CSR initiatives. Nowadays, 56% of managers consider CSR as a high or very high priority [22], and 87% of firms have a CSR program. Why? CSR may provide insurance-like prevention. During normal time, it does not make any differences for firms to invest in CSR. However, during crisis, firms' CSR investment can function as a hedge against reputation loss. The *Financial Times* (2004) also said that CSR is best seen as a risk management, an avoidance strategy to shun damages.

Take another example; Mattel in 2007 faced the largest toy recall, covering some of its most popular product lines, because those toys were found to contain extremely high levels of lead paint [23]. Disclosing the problem, Mattel decided to recall the toys despite its high cost. The impact on firms' reputation depends on public perception and investor's tolerance. Since Mattel has been doing CSR activities, the public are more lenient and willing to see it as a mistake.

In this paper, we are going to examine whether CSR acts as an insurance-like protection for firms when facing negative events. However, since records of firm-specific negative accidents are hard to come by, we employ macoeconomic condition (recession) to be designated as negative events. Based on the data of TWSE-listed companies during 2005Q1~2010Q3, by means of regression analysis on group comparison (CSR versus NonCSR firms), we examine whether CSR firms outperform NonCSR firms during recession. The regression result revealed that during our sample period, CSR firms outperform NonCSR firms. During recession, however, all firms have worse performance, and the degree of performance superiority of CSR firms becomes larger but insignificant. While doing CSR brings positive feedback for firms during normal time, its advantage is even better during abnormal period.

The remainder of this paper is organized as followed. Section 2 illustrates literature review. Section 3 discusses why and how CSR acts as insurance for firms' financial performance. Section 4 and 5 introduce participants and instrument respectively. Section 6 introduces variables and data analyses. Section 7 reports the analysis results. Finally, the final section concludes the paper with empirical implications.

2. Literature Review

Finance researchers have been trying to discover the effects of CSR on corporate performance theoretically and empirically, although doing CSR has become a trend for global management. Are CSR activities purely costs or expenses? Is firms' donation purely public relation expense? Does CSR have the ability to enhance firms' reputational assets? Consistently, when and how could firms retrieve the investing resources? If the answers were negative, doing CSR may not be a long-run optimal strategy for firms. Conversely, if CSR actions could earn money to offset costs in the long run, both firms and society could reach win-win condition.

Theoretically, stakeholder theory states that since stakeholders provide a subtle connection between corporate strategy and corporate well-being, managers' dishonest conducts jeapodize stakeholders' trust [10, 24]. By contrast, excellent CSR acivities gain stakeholders' trust [25]. Previous research revealed that doing CSR could gain social trust, alleviate threat of loss [26], and improve many things such as reputation [20], employee productivity, brand image and competitiveness [13,27,28,29,30]. However, good CSR activities are costly [31]. Firms should be discreet about where they put their money into. For instance, aiming to make profits and reward shareholders, firms' spending resources on philanthropy or on any "feel good" project is economically unethical. These added costs may include making expensive donations, promoting community development plans, maintaining plants in economically disadvantageous locations and launching environmental protection activities [32,33]. Moreover, firms may need to limit their strategic choices or abandon certain opportunities for the sake of doing CSR to keep their reputation [14,15,34]. In fact, it is hard for firms to gain a win-win situation due to the high cost of complying with environmental regulation, which can diminish corporate stock values [19,35,36].

Previous studies revealed that firms with higher CSR ratings outperform the others, indicating a positive correlation between CSR and FP [37]. A report of relationship between CSR and FP based on the *Fortune* magazine's ratings found that firms' prior performance (stock market returns and accounting-based measures) is more strongly related to corporate CSR than subsequent FP [7]. They also found negative relationship between CSR and corporate risk. A reputation rating developed by Kinder, Lydenberg and Domini (KLD) as a proxy of CSR revealed that past and current KLD ratings are positively related to firms' returns on assets (*ROA*)[8,9]. In addition to *ROA*, positive relationships between CSR and returns on equity (*ROE*), CSR and returns on sales (*ROS*) were also confirmed. [9,38,39,40,41,42,43,44].

Nevertheless, a negative relationship between CSR and stock price changes was found by means of Business and Society Review's reputational surveys [33,37]. A study comparing firms practicing environmental assessment with those without assessment revealed that the former is underperformed, suggesting a negative relationship between CSP and CFP [45]. Based on the Ethical Investment Research Service (EIRIS), which specialize in the measurement of corporate social performance (CSP), scores on corporate social performances indicator are found significantly and negatively related to stock returns [11]. The poor return is attributable to firms' good social performance on the employment and to a lesser extent the environmental aspects. An analysis of Fortune magazine's annual list of "America's Most Admired Companies" during 1983 and 2006 found that stocks of admired firms had lower returns, on average, than those of inferior firms [12]. In fact, a great deal of empirical studies about the relationship between CSR and FP were confirmed singnificantly [20,36,46,47,48].

In fact, it is worth examining different variables, investigating mediating mechanisms, exploring contextual conditions, and establishing links between social and financial performances [19]. Previous studies have been found the lack of identifying sampling problems, conducting reliability and validity of CSR and FP measures, using control variables, examing mediating mechanisms, and employing moderating variables [13,17,19,20,25,49,50,51,52,53,54,55,56]. Thus, future research could focus on these directions.

Some research revealed that industrial growth is a moderator between the relationships between firms' environmental and economic performances, which are also positively correlated. In other words, the higher economic performance is the better environmental performance is [41,57]. By contrast, using firms' intangible resources as a mediator for the relationship between CSR and FP, other research found that there is no direct relationship between CSR and FP—merely an indirect relationship that relies on the mediating effect of firms' intangible resources. It is worth noting whether credit rating (cost of debt) plays a mediating role of the relationship between CSR and NonCSR firms' performance [58]. To sum up, the aim of this paper is to examine three moderators between CSR and FP, namely, news exposure, CEO compensation, directors and supervisors' stock pledge ratio.

3. CSR Provides Insurance-like Protection for Financial Performance

Though there has been no consensus in the positive effects of CSR on FP, more and more firms are engaging in CSR activities. One possible reason is that the benefits of doing CSR cannot usually be observed in normal time though its value glistens during economic downturn. Although positive effects of CSR on performance are indefinite, they could provide denfence when negative events occur. To discover the value of CSR, we have to examine relative performance during economic downturn.

First of all, constructing a model to investigate whether CSR activities insure firms against losing reputation when facing adverse shocks [23], Minor and Morgan (2010) analyzed the stock price responses following product recalls and found that firms with better CSR ratings suffer less loss than those with lower CSR. Secondly, firms that dedicate to CSR actions suffer less reputational damage after negative events than those that do not. In addition, investigating the stock price responses of 47 chemical firms following 1984 Union Carbide's releases of chemical substance, Blacconiere and Patten (1994) found that firms with higher degree of environmental reports have smaller negative market reactions on stock price [64]. Blacconiere and Northcut (1997), Walden and Schwartz (1997), and Patten and Nance (1998) showed similar results which prove that CSR has mitigation function after negative events occurred [65,66,67]. To sum up, the insurance value for CSR could explain firms' investment in CSR, however invisible and costly. Though previous findings have demonstrated that doing CSR strategically improve firms' competitiveness over their rivals, it is the aim of this paper to investigate whether doing CSR actually acts as an insurance against risk management.

4. Participants

The aim of this paper is to discover the relationship between CSR and FP. Thus, according to Griffin and Mahon (1997), financial performance measurement can be categorized into two types: accounting-based (such as return on assets, returns on equity), and market-based (such as stock returns and Tobin's Q) [55]. While the former only describes firm's historical performance, the latter is forward-looking but dependent on subjective assessment [10]. Adopting Moore's (2001), we employ the accounting-based method, using returns on assets (*ROA*), returns on equity (*ROE*), returns on sales (*ROS*), operating profit margin (*OPERA*) and earnings per share (*EPS*) [68]. In terms of CSR measurements, criteria are often based on firm's pollution control efforts, environmental protection efforts and social reputation [32,38,69]. In fact, while some employed subjective, nonquantitative indicators such as survey for company impression on firm's CSR from business school students [70], others, such as *Fortune*, investigated corporation social prestige ranking [10,25,71].

In Taiwan, one of the leading business magazines, the *Global Views Monthly* (*GVM*), evaluates CSR of TWSW-listed on three dimensions annually: community participation, environmental protection and financial transparency. The *GVM* also checks whether firms have (1) negative news reports, (2) negative records by external audit agencies, (3) major labor disputes, environmental protection accident and public nuisance action cases, consumer disputes and management fraud or leave in the past three years, and (4) operating losses for three consecutive years. Companies receive CSR Award when their scores are relatively higher than their counterparts. In this paper, when a company wins a CSR Award, it is defined as a CSR firm, thus gaining 1 point. Otherwise, it is a NonCSR firm, thus gaining 0 point. Winners of CSR Award are reported in Table 1.

Table 1 TWSE-listed CSR-firms

2005			
	Lite-On Technology Co.	China Motor Co.	Taiwan Semiconductor Manufacturing Co.
	Delta Electronics, Inc.	Accton Technology Co.	President Chain Store Co.
	Taiwan Mobile Co.		
2006			
	AU Optronics Co.	Lite-On Technology Co.	Taiwan Semiconductor Manufacturing Co.
	Delta Electronics, Inc.	Advantech Co.	Wah Lee Industrial Co.
	President Chain Store Co.	Sinyi Realty Inc.	China Airlines
	China Motor Co.	Yulon-Nissan Motor Co.	Uni-President Enterprises Co.
2007			
	Delta Electronics, Inc.	Chimei Innolux Corp.	Lite-On Technology Co.
	Advantech Co.	MediaTek Inc.	AVerMedia Technologies Inc
	Chunghwa Telecommunication	Sinyi Realty Inc	Taiwan Mobile Co.
	China Motor Co.	Yulon-Nissan Motor Co.	Uni-President Enterprises Co.
2008			
	Chimei Innolux Corporation	UMC	ZyXEL Communications Co.
	Camel Precision Co.	MediaTek Inc.	Lite-On Technology Co.
	Hotai Motor	Sinyi Realty Inc	President Chain Store Co.
	Yulon Motors	Pou Chen Group.	TECO Electric and Machinery Co.
2009			
	Sinyi Realty Inc.	President Chain Store Co.	Taiwan Semiconductor Manufacturing Co.
	Chunghwa Telecommunication	AU Optronics Co.	ZyXEL Communications Corp.
	Yulon Motors	Macronix International Co., Ltd.	Uni-President Enterprises Co
	Advantech Co.		
2010			
	Lite-On Technology Co.	Taiwan Mobile Co.	Taiwan Semiconductor Manufacturing Co.
	Macronix International Co.	Inventec Co.	Uni-President Enterprises Co.
	Sinyi Realty Inc.	China Motor Co.	Chunghwa Telecommunication
	Yulon Motors	Nan Ya Plastics Co.	Delta Electronics, Inc.
	TXC Co.		

Notes:
This table reports name list for winners of CSR Award from the *Global Views Monthly*. All detailed information about CSR Award is referred to http://www.gvm.com.tw/CSR2010/index.html. Financial institutions are excluded.

5. Instruments

The aim of this paper is to examine the insurance function of CSR druing normal time and recession by discovering whether CSR firms outperform NonCSR firms. We employed nine Business Indicators, which were created by the Council for Economic Planning and Development (CEPD). The nine indicators measuring economic activities are divided into financial sector and real sector. The former includes money supply M1B, direct and indirect finance, bank clearings and remittance, and stock price, while the latter includes manufacturers' new orders (deflated), exports (deflated), industrial production, manufacturers' inventory ratio, and nonagricultural employment. Scores of each indicator range from 1 point at minimum to 5 points at maximum. Thus, total score ranges from 9 to 45 points, which categorize five different economic conditions. Respectively, the score that is greater than 38 is defined as "overheated" and represented by a red light. The score ranging from 32 to 37 is marked by "heat alert" and represented by yellow-red light. The score ranging from 23 to 31 is marked by "steady" and represented by green light. The score ranging from 17 to 22 is marked by "down alert" and represented by yellow-blue light. The score less than 17 is marked by "slowdown" and represented by blue light. The construction of scores is illustrated in Table 2.

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Table 2 Construction of the Business Indicators

	Check Points / Indicator	Red	Yellow-Red	Green	Yellow-Blue	Blue
		5 point	**4 point**	**3 point**	**2 point**	**1 point**
Financial Indicators	**Money Supply M1B**	← 14	Percentage change- 12-month span 12	6		3.5 →
	Direct & Indirect Finance	← 15	Percentage change- 12-month span 13.5	10		7.5 →
	Bank Clearings & Remittance	← 23	Percentage change- 12-month span 15	4		0 →
	Stock Price	← 37	Percentage change- 12-month span 20	0		13 →
Real Sector Indicators	**MFGs' New Orders (Deflated)**	← 15	Percentage change- 12-month span 11	5		2 →
	Exports (Deflated)	← 17	Percentage change- 12-month span 12	4		1 →
	Industrial Production	← 10.5	Percentage change- 12-month span 7.5	3		0 →
	MFGs' Inventory Ratio	← 53	Ratio of current month 56.5	66		71 →
	Nonagricultural Employment	← 2.8	Percentage change- 12-month span 2.4	1.4		0.9 →
	Total Scores	**Overheat**	**Heat Alert**	**Steady**	**Down Alert**	**Slowdown**
		45-38	**37-32**	**31-23**	**22-17**	**16-9**

Notes:
All detailed information about the construction of the Business Indicators by the CEPD is referred to http://index.cepd.gov.tw/index.aspx. Individual components and check points are in terms of percentage changes over 1-year span. All components, except stock price index, have been seasonally adjusted.

In Table 2, scores of various economic conditions in three-month period are averaged to yield a quarterly score. In this study, depression is defined so when the quarterly score is equal to or below 22. Under this definition, during our sample period from 2005Q1~2010Q3, recession quarters include 2005Q2, 2005Q3, 2006Q3, 2006Q4, 2007Q1, 2007Q2, 2008Q3, 2008Q4, 2009Q1, 2009Q2 and 2009Q3. The aim of this study is to examine whether CSR firms outperform NonCSR firms during recession. If the answer were yes, the belief that CSR acts as insurance for financial performance duning economic downturn is confirmed.

6. Variables and Data Analysis

The statistical method is mainly based on multivariate regression analysis. The following regression equation is employed in this study.

$$PERFORMANCE = \beta_0 + \beta_1 D_{CSR} + \beta_2 ASSET + \beta_3 DEBT + \beta_4 RD + \beta_5 SALESG + \beta_6 D_{RES} + \beta_7 D_{RES} \cdot D_{CSR} + \varepsilon$$

When a firm takes CSR during nonrecession, $D_{CSR} = 1, D_{RES} = 0$. Then

$$E(Performance) = (\beta_0 + \beta_1) + \beta_2 ASSET + \beta_3 DEBT + \beta_4 RD + \beta_5 SALESG$$

When a firm does not take CSR during non-recession, $D_{CSR}=0, D_{RES}=0$. Then

$$E(Performance)=(\beta_0)+\beta_2 ASSET+\beta_3 DEBT+\beta_4 RD+\beta_5 SALESG$$

When a firm takes CSR during recession, $D_{CSR}=1, D_{RES}=1$. Then

$$E(Performance)=(\beta_0+\beta_1+\beta_6+\beta_7)+\beta_2 ASSET+\beta_3 DEBT+\beta_4 RD+\beta_5 SALESG$$

When a firm does not take CSR during recession, $D_{CSR}=0, D_{RES}=1$. Then

$$E(Performance)=(\beta_0+\beta_6)+\beta_2 ASSET+\beta_3 DEBT+\beta_4 RD+\beta_5 SALESG$$

In this study, *PERFORMANCE* refers to five proxies for performance variables, namely, *ROA, ROE, ROS, OPERA* and *EPS*. D_{CSR} refers to a proxy for firms' CSR performance. When a firm wins a CSR Award from the *Global Views Monthly*, the D_{CSR} is equal to one. By contrast, when otherwise, the D_{CSR} is equal to zero, indicating that D_{CSR} refers to a dummy variable. *ASSET* refers to total assets of a firm. *DEBT* refers to debt ratio. *RD* refers to a ratio of R&D expense to net sales. *SALESG* refers to the rate of sales growth. D_{RES} refers to a proxy for macroeconomic status. When the score for a given quarter is equal to or less than 22, D_{RES} is equal to one. By contrast, when otherwise, the D_{RES} is equal to zero.

If the estimated coefficients of CSR dummies were significantly positive, CSR firms outperform NonCSR ones. If the estimated coefficients of recession dummies were significantly negative, firms perform worse during economic downturn. If the estimated coefficients of CSR and those of recession dummies were significantly positive, performance of CSR firms during economic downturn is significantly better, indicating that CSR provides insurance function for firms during recession. CSR firms enjoy a buffering value during a negative event by means of insurance protection. The focus of this study is on the significance of these estimated coefficients for dummies. Table 3 describes definition of variables.

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Table 3 Definition of Variables

Variable	Definition
D_{CSR}	A dummy variable which is equal to one if a firm is a winner of "CSR Award" (interchangeable with a CSR-firm). Otherwise, it is equal to zero (interchangeable with a NonCSR-firm).
D_{RES}	When the Business Indicator (constructed by Council for Economic Planning and Development; CEPD) of a given quarter is equal to or less than 22 points, it is defined as recession and is equal to one, and to zero if otherwise.
ASSET	Current Assets + long-term investment + total fixed assets + total other assets
DEBT	Total liability/total assets
RD	(Research and development expenses) /net sales
SALESG	(Net sales at time t –net sales at time t-1) /| net sales at time t-1|
ROA	Net income / average total asset
ROE	Net income / average total equity
ROS	Gross profit (margin) on sale / net sales
OPERA	Operating profits /net sales
EPS	Net income /shares outstanding

Notes:
The definition of variables comes from the Taiwan Economic Journal and the *Global Views Monthly* and the database of the Council for Economic Planning and Development (CEPD).

Two things are worth noticing. First, because we are going to examine the relationship between CSR and FP by regression analysis, other control variables for performance are needed. Thus, we use four controls, namely, total assets (*ASSET*), debt ratio (*DEBT*), research and development expense ratio (*RD*) and the growth rate of net sales (*SALES*). Second, in regression equation, when the explanatory variables and the explained variables are contemporaneous, possible problems exist, so we also run an additional regression such that the explained variables are in subsequent stage as opposed to the explanatory variables.

Heckman (1979) suggested using a two-stage method to eliminate sample selection bias [59]. The first step is to estimate a probability model which determines whether samples are included in CSR firms. The resulting inverse Mill's ratio serves as one of the explanatory variables in performance equation at the second stage. Alternatively, Rubin (1973a, b) developed matching theory while Rosenbaum and Rubin (1983, 1985a, b) proposed Propensity Score Matching (PSM) [60,61,62]. Both are intuitive methods to eliminate sample selection bias [72,73].

For regression analysis, we use group comparison (CSR versus NonCSR firms) to examine whether CSR firms or NonCSR firms perform better during normal time and during recession. Our data range from 2005Q1~2010Q3. So we divide samples into four groups, namely, CSR firms in normal time, NonCSR firms in normal time, CSR firms in recession and

NonCSR firms in recession. If the performance difference is salient in recession, it implies that CSR firms outperform NonCSR firms during recession, indicating that insurance protection for financial performance by CSR exists.

7. Results

In this paper, we have 231 CSR and 16,237 NonCSR firm samples. Variables whose values exceed three standard deviations of mean are deleted. In Table 4, statistics reveal that CSR firms have larger total assets than NonCSR firms (17.594 versus 15.612). CSR firms' average *DEBT* is lower (33.432 versus 37.353). CSR firms' *RD* and *SALESG* are relatively higher (3.1913 versus 2.5769 and 8.1473 versus 7.5868, respectively). For further analysis, we found that all of five performance variables are relatively higher for CSR firms, implying that CSR firms have superior performance than NonCSR firms on *ROA*, *ROE*, *ROS*, ratio of operating income and earnings per share (*EPS*) over sample period.

Table 4 Descriptive Statistics

Variable	All Samples				CSR-firms				NonCSR-firms			
	Mean	Ste. Dev.	Min.	Max.	Mean	Ste. Dev.	Min.	Max.	Mean	Ste. Dev.	Min.	Max.
D_{CSR}	0.0140	0.1176	0.0000	1.0000	**1.0000**	0.0000	1.0000	1.0000	**0.0000**	0.0000	0.0000	0.0000
D_{RES}	0.4783	0.4995	0.0000	1.0000	**0.4545**	0.4990	0.0000	1.0000	**0.4786**	0.4996	0.0000	1.0000
ASSET	15.637	1.1811	12.207	19.476	**17.594**	1.0121	15.249	19.385	**15.612**	1.1622	12.207	19.476
DEBT	37.295	16.439	0.4400	88.550	**33.432**	16.611	9.4000	77.910	**37.353**	16.430	0.4400	88.550
RD	2.5860	4.2227	-6.9600	46.980	**3.1913**	4.0104	0.0000	26.110	**2.5769**	4.2253	-6.9600	46.980
SALESG	7.5952	39.405	-103.06	215.34	**8.1473**	32.568	-62.960	179.64	**7.5868**	39.501	-103.06	215.34
ROA	2.3370	2.5436	-6.9300	11.680	**3.9291**	2.5798	-2.9400	10.770	**2.3132**	2.5356	-6.9300	11.680
ROE	2.2620	4.4224	-22.060	27.300	**4.0276**	3.4392	-12.330	16.230	**2.2354**	4.4303	-22.060	27.300
ROS	18.914	16.591	-53.420	98.220	**24.952**	16.672	-36.770	60.180	**18.823**	16.573	-53.420	98.220
OPERA	5.6894	15.692	-122.12	98.610	**12.000**	13.692	-43.730	46.850	**5.5941**	15.701	-122.12	98.610
EPS	0.4882	0.7523	-2.0100	3.7100	**0.8631**	0.6496	-1.7900	3.5200	**0.4827**	0.7523	-2.0100	3.7100

Notes:
Variables whose values exceed three standard deviations of mean are deleted. There are 16,468 samples, of which 16,237 are samples of NonCSR-firms and 231 are CSR-firms.

Next, Table 5 reports the correlation coefficients matrix between variables. From the first column of this table, we observe that correlation coefficients between D_{CSR} and *ASSET* is significantly positive (0.1862), indicating that CSR firms have larger

assets. Correlation coefficients between D_{CSR} and *DEBT* is -0.0287, between D_{CSR} and *RD* is 0.0176. Both are statistically significant, indicating that CSR firms have lower debt ratio and higher research and development expense to net sales. The correlation coefficients between D_{CSR} and *ROA, ROE, ROS, OPERA* and *EPS* are all significantly positive, indicating that CSR firms have higher performance on five measures. When we observe the second column, the correlation coefficients between D_{RES} and *ROA, ROE, ROS, OPERA* and *EPS* are all significantly negative, indicating that CSR firms perform badly in all five measures during recession.

Table 5 Correlation Matrix

	D_{CSR}	D_{RES}	*ASSET*	*DEBT*	*RD*	*SALESG*	*ROA*	*ROE*	*ROS*	*OPERA*	*EPS*
D_{CSR}	1.0000										
D_{RES}	-0.0057	1.0000									
ASSET	0.1862*	-0.0129	1.0000								
DEBT	-0.0287*	0.0128	0.1511*	1.0000							
RD	0.0176*	0.0169*	-0.1160*	-0.2559*	1.0000						
SALESG	0.0017	-0.2236*	0.0574*	0.0471*	-0.0753*	1.0000					
ROA	0.0767*	-0.0377*	0.0823*	-0.1826*	0.0294*	0.3134*	1.0000				
ROE	0.0490*	-0.0374*	0.0938*	-0.0855*	-0.0227*	0.3131*	0.8279*	1.0000			
ROS	0.0446*	-0.0318*	-0.1272*	-0.2796*	0.2709*	0.0785*	0.4175*	0.3555*	1.0000		
OPERA	0.0494*	-0.0624*	0.0514*	-0.2037*	-0.0079	0.2562*	0.6030*	0.5624*	0.6733*	1.0000	
EPS	0.0602*	-0.0497*	0.1367*	-0.0907*	0.0110	0.3033*	0.8117*	0.8509*	0.3209*	0.5031*	1.0000

Notes:
This table reports correlation coefficients among variables. See Table 3 for the definition of variables. There are 16,468 firm-quarter samples, with 16,237 samples of NonCSR-firms and 231 CSR-firms. A correlation coefficient followed by an asterisk means that it is at least 90% significantly different from zero.

Furthermore, Table 6 reports the pooled ordinary least square (OLS) results of regression analysis on the relationship among firms' financial performance, CSR, recession dummies, cross-product term of CSR dummies, recession dummies, control factors and one-period lag dependent variable, *LAG(1)*. The explained variables are five firm's performance measures, *ROA*, *ROE*, *ROS*, *OPERA* and *EPS*. Control factors are *ASSET*, *DEBT*, *RD*, *SALESG* and 17 industry dummies (not reported in the table). Under the consideration of reverse causation of problems, for all five estimated regressions, estimated equations are fixed to the specifications that the explained variable is in subsequent period relative to the explanatory variables.

First, no matter which performance measure is used for the explained variables, the estimated coefficients of CSR dummies are all positive, indicating that CSR firms perform well on all five measures. However, only when measures are *ROA* and *ROE*, the estimated coefficients reach statistical significance. Second, the estimated coefficients of recession dummies are significantly negative (-0.0594 and -0.1149) when performance measures are *ROA* and *ROE*, and are significantly positive

(0.2592) when performance measure is *ROS*. This implies that firms perform well in returns on assets, returns on equity, and in returns on sales during recession. Third, when four out of five performance measures are employed, the estimated coefficients of cross-product term of CSR dummies and recession dummies are positive, indicating that during recession, CSR firms perform well on four performance measures although these coefficients are not reaching statistical significance. Previous research revealed that if CSR acts as insurance for financial performance during recession, the coefficient of cross-product term of two dummies should be positive. Fourth, for control variables, although the estimated result is not fully consistent, it generally shows that firms with larger assets, lower debt ratio, higher research and development expense ratio and higher growth rate of net sales perform well on these performance measures.

Table 6 Regression Results of Pooled Estimation

Explanatory Variables	Explained Variables				
	ROA	***ROE***	***ROS***	***OPERA***	***EPS***
Constant	0.5561 (2.43)	0.1087 (0.24)	7.7293 (7.06)	1.8891 (1.26)	-0.1282 (-1.99)
D_{CSR}	0.2562** (2.03)	0.5995** (2.40)	0.6980 (1.64)	0.5196 (0.99)	0.0441 (1.07)
D_{RES}	-0.0594** (-1.96)	-0.1149** (-1.97)	0.2592* (1.92)	-0.2660 (-1.55)	-0.0110 (-1.25)
D_{CSR} *D_{RES}	0.1589 (0.67)	0.4792 (1.07)	-0.2536 (-0.32)	0.4311 (0.44)	0.0742 (0.99)
ASSET	0.0423*** (2.93)	0.0818*** (2.81)	-0.2131*** (-3.33)	0.1204 (1.36)	0.0207*** (5.09)
DEBT	-0.0079*** (-7.04)	-0.0046* (-1.78)	-0.0252*** (-4.11)	-0.0373*** (-5.16)	-0.0008*** (-2.63)
RD	0.0139*** (3.09)	0.0026 (0.30)	0.2253*** (8.40)	0.1033*** (3.29)	0.0021 (1.62)
SALESG	0.0020*** (4.48)	0.0069*** (7.06)	0.0046* (1.78)	0.0050 (1.47)	0.0007*** (4.72)
LAG(1)	0.6768*** (74.2)	0.5543*** (38.6)	0.8318*** (83.0)	0.7059*** (40.4)	0.6809*** (65.9)
Num. of Obs.	13,900	13,995	14,025	14,010	13,808
Adj. R-square	0.5208	0.3796	0.7765	0.5626	0.5291

Notes :
This table reports results of the pooled OLS estimation of relating firm's financial performance measures to CSR, control factors and one-period lag dependent variable, *LAG(1)*. The explained variables are five firm's performance measures, *ROA*, *ROE*, *ROS*, *OPERA* and *EPS*. D_{CSR} is a dummy which is equal to 1 if sample is CSR firm, and 0 if otherwise. D_{RES} is a dummy which is equal to 1 if sample is in recession and 0 if otherwise. D_{CSR}*D_{RES} is a cross-product term. Other control factors are *ASSET*, *DEBT*, *RD*, *SALESG* and 17 industry dummies (not report them in the table). Under the consideration of reverse causation problem, for all five estimated regressions, the estimated coefficients are fixed to the specifications that the explained variable is in subsequent period relative to the explanatory variables. The *t*-statistics (computed by White's heteroskedasticity-consistent standard errors) are shown in the parentheses, and***, ** and * denote that the estimated coefficients reach 1%, 5% and 10% significance level.

To sum up, further analysis of Table 6 revealed that doing CSR per se guarantees better performance. However, during recession, firms generally perform worse. During recession, CSR firms outperform NonCSR firms but not statistically significant. Thus, based on Table 6, although we get positive estimated coefficients, they are not reaching statistical significance. Thus, we have very little evidence supporting that CSR can provide insurance-like protection for financial

performance during recession. Next, we are going to employ fixed-effect and random-effect estimation for our data, because our data contain samples of firms ranging from 2005Q1~2010Q3 with panel form,

Table 7 Regression Results with Fixed Effect Estimation

Explanatory Variables	Explained Variables				
	ROA	***ROE***	***ROS***	***OPERA***	***EPS***
Constant	20.019 (15.5)	33.785 (13.2)	55.000 (10.4)	44.779 (6.91)	3.3260 (9.06)
D_{CSR}	-0.1417 (-1.04)	-0.1908 (-0.72)	0.3509 (0.65)	0.0013 (0.00)	-0.0774 (-1.64)
D_{RES}	-0.1102*** (-3.98)	-0.2202*** (-4.12)	-0.0382 (-0.31)	-0.6701*** (-4.32)	-0.0272*** (-3.40)
D_{CSR} *D_{RES}	0.1201 (0.57)	0.4870 (1.29)	0.1453 (0.18)	0.8657 (0.90)	0.0568 (0.88)
ASSET	0.0102*** (4.31)	0.0430*** (8.28)	-0.0060 (-0.49)	0.0166 (1.10)	0.0052*** (7.79)
DEBT	-1.1913*** (-14.3)	-2.1264*** (-12.8)	-2.8325*** (-8.51)	-2.5965*** (-6.29)	-0.2016*** (-8.53)
RD	-0.0555*** (-5.83)	-0.1116*** (-6.16)	0.0814 (1.52)	-0.3226*** (-3.40)	-0.0132*** (-5.00)
SALESG	0.0039*** (8.73)	0.0089*** (9.33)	0.0124*** (4.96)	0.0172*** (5.44)	0.0013*** (9.28)
LAG(1)	0.3331*** (26.7)	0.2556*** (15.9)	0.4324*** (21.5)	0.3732*** (14.9)	0.3331*** (24.1)
Num. of Obs.	13,906	14,001	14,031	14,016	13,814
Adj. R-square	0.1715	0.1333	0.2063	0.1854	0.1602

Notes:

This table reports results of the fixed effect estimation of relating firm's financial performance measures to CSR, control factors and one-period lag dependent variable, *LAG(1)*. The explained variables are five firm's performance measures, *ROA*, *ROE*, *ROS*, *OPERA* and *EPS*. D_{CSR} is a dummy which is equal to 1 if sample is a CSR firm, and 0 if otherwise. D_{RES} is a dummy which is equal to 1 if sample is in recession and 0 if otherwise. D_{CSR}*D_{RES} is a cross-product term. Other control factors are *ASSET*, *DEBT*, *RD*, *SALESG* and 17 industry dummies (not report them in the table). Under the consideration of reverse causation problem, for all five estimated regressions, the estimated coefficients are fixed to the specifications that the explained variable is in subsequent period relative to the explanatory variables. The *t*-statistics (computed by White's heteroskedasticity-consistent standard errors) are shown in the parentheses, and***, ** and * denote that the estimated coefficients reach 1%, 5% and 10% significance level.

Table 7 reports findings of fixed-effect estimation on the relationship of firms' financial performance to CSR and other control factors. First, estimated coefficients of CSR dummies are either positive or negative, but none of them are significant, indicating that effects of doing CSR are not significant. Second, all of five estimated coefficients of recession dummies are negative, and four of them are significant, indicating that when macroeonomic status is negative, firms perform badly in almost all performance measures. Third, no matter which performance measures are employed, the estimated coefficients of cross-product term of CSR dummies and recession dummies are all positive, indicating that during recession, CSR firms outperform

NonCSR firms on all five performance measures though these coefficients are not reaching statistical significance. To sum up, our evidence is still insignificant and insufficient to prove that CSR acts as insurance for financial performance during recession. For controls, although the estimated result is not fully consistent, it generally reveals that firms with larger assets, lower debt ratio, lower research and development expense ratio and higher growth rate of net sales perform well on these performance measures.

Table 8 Regression Results with Random Effect Estimation

Explanatory Variables	Explained Variables				
	ROA	***ROE***	***ROS***	***OPERA***	***EPS***
Constant	0.5728 (2.27)	0.2621 (0.47)	5.9783 (6.16)	2.3197 (1.12)	-0.0683 (-0.72)
D_{CSR}	0.2120* (1.66)	0.4068 (1.62)	0.5937 (1.45)	0.0450 (0.07)	0.0056 (0.13)
D_{RES}	-0.0590** (-1.97)	-0.1178** (-2.07)	0.2719** (2.01)	-0.3658** (-2.21)	-0.0139* (-1.65)
D_{CSR} *D_{RES}	0.1423 (0.61)	0.4419 (1.04)	-0.1891 (-0.24)	0.5011 (0.51)	0.0611 (0.89)
ASSET	0.0320** (1.97)	0.0608* (1.67)	-0.1954*** (-3.22)	0.0950 (0.72)	0.0181*** (2.96)
DEBT	-0.0070*** (-5.82)	-0.0007 (-0.22)	-0.0227*** (-3.86)	-0.0411*** (-4.07)	0.0000 (-0.04)
RD	0.0208*** (4.31)	0.0093 (0.89)	0.1705*** (7.27)	0.0801* (1.82)	0.0041** (2.40)
SALESG	0.0024*** (5.35)	0.0080*** (8.09)	0.0032 (1.26)	0.0100*** (2.90)	0.0010*** (7.08)
LAG(1)	0.6393*** (67.1)	0.4816*** (32.1)	0.8574*** (95.3)	0.5962*** (28.9)	0.5516*** (45.7)
Num. of Obs.	13,906	14,001	14,031	14,016	13,814
Adj. R-square	0.1422	0.1006	0.1988	0.1748	0.1416

Notes:
This table reports of results of the random effect estimation of relating firm's financial performance measures to CSR, control factors and one-period lag dependent variable, *LAG(1)*. The explained variables are five firm's performance measures, *ROA*, *ROE*, *ROS*, *OPERA* and *EPS*. D_{CSR} is a dummy which is equal to 1 if sample is a CSR firm, and 0 if otherwise. D_{RES} is a dummy which is equal to 1 if sample is in recession and 0 if otherwise. D_{CSR}*D_{RES} is a cross-product term. Other control factors are *ASSET*, *DEBT*, *RD*, *SALESG* and 17 industry dummies (not report them in the table). Under the consideration of reverse causation problem, for all five estimated regressions, the estimated coefficients are fixed to the specifications that the explained variable is in subsequent period relative to the explanatory variables. The *t*-statistics (computed by White's heteroskedasticity-consistent standard errors) are shown in the parentheses, and***, ** and * denote that the estimated coefficients reach 1%, 5% and 10% significance level.

Table 8 reports findings of random-effect estimation on the relationship of firms' financial performance to CSR and other control factors. First, some estimated coefficients of CSR dummy are positive while others are marginally significant, indicating that firms with CSR perform better on returns on assets and returns on equity. Second, four out of five recession dummy coefficients are significantly negative while one of them is significantly positive, indicating that when macroeconomic status is negative, firms perform badly in almost all performance measures. Third, four out of five estimated coefficients of cross-product term of CSR dummies and recession dummies are positive, indicating that during recession, CSR firms perform well on performance measures though these coefficients are not reaching statistical significance. Similarily, our evidence is still insignificant and insufficient to prove that CSR acts as insurance for financial performance during recession. Finally, for controls, although the estimated result is not fully consistent, it reveals that firms with larger assets, lower debt ratio, higher research and development expense ratio and higher growth rate of net sales perform well on these performance measures.

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Table 9 Regression Results of Heckman's Two-stage Estimation

Heckman's Two-stage Estimation							
First Stage		Second Stage					
Explanatory Variables	Explained Variables D_{CSR}	Explanatory Variables	Explained Variables				
			ROA	*ROE*	*ROS*	*OPERA*	*EPS*
Constant	-10.496*** (-18.0)	*Constant*	0.4355 (1.58)	-0.7737 (-1.49)	7.5325 (6.11)	0.0979 (0.06)	-0.2616 (-3.27)
ASSET	0.5177*** (14.5)	D_{CSR}	-0.2933 (-0.55)	-1.8227* (-1.82)	-2.0984 (-0.89)	-7.0182** (-2.41)	-0.2932* (-1.92)
LDEBT	6.24E-08* (1.91)	D_{RES}	-0.0575* (-1.92)	-0.1068* (-1.88)	0.2035 (1.54)	-0.3302** (-1.99)	-0.0090 (-1.03)
LPROFIT	-0.0080*** (-3.53)	D_{CSR} *D_{RES}	0.1016 (0.40)	0.2424 (0.52)	-0.3230 (-0.28)	0.0532 (0.04)	0.0689 (0.95)
		ASSET	0.0499*** (2.85)	0.1387*** (4.18)	-0.1970** (-2.56)	0.2403** (2.50)	0.0292*** (5.73)
		DEBT	-0.0078*** (-7.63)	-0.0044** (-2.26)	-0.0271*** (-6.02)	-0.0378*** (-6.61)	-0.0008*** (-2.73)
		RD	0.0134*** (3.31)	0.0028 (0.37)	0.2165*** (11.4)	0.1048*** (4.71)	0.0024** (2.08)
		SALESG	0.0022*** (5.22)	0.0071*** (9.11)	0.0048*** (2.78)	0.0039* (1.74)	0.0007*** (5.93)
		LAG(1)	0.6783*** (102)	0.5541*** (75.0)	0.8355*** (176)	0.7105*** (114)	0.6814*** (103)
		lambda	0.2463 (1.03)	1.0736** (2.41)	1.2784 (1.21)	3.4201*** (2.64)	0.1540** (2.26)
		Num. of Obs.	13,691	13,790	13,820	13,794	13,625

Notes :
This table reports results of Heckman's two-stage estimation (in order to correct for sample selection bias) of relating firm's financial performance measures to CSR, control factors and one-period lag dependent variable, *LAG(1)*. The explained variables are five firm's performance measures, *ROA*, *ROE*, *ROS*, *OPERA* and *EPS*. D_{CSR} is a dummy which is equal to 1 if sample is a CSR firm, and 0 if otherwise. D_{RES} is a dummy which is equal to 1 if sample is in recession and 0 if otherwise. D_{CSR}*D_{RES} is a cross-product term. Other control factors are *ASSET*, *DEBT*, *RD*, *SALESG* and 17 industry dummies (not report them in the table). For all five regression estimation, the first stage is a probability model which determined whether a sample is in CSR firm or NonCSR firm [use *ASSET* (natural log of current-period total assets), *LDEBT* (last-period debt ratio) and L*PROFIT* (last-period after-tax profits levels) as independent variables]. The second stage is then adding an inverse Mill's ratio to above mentioned regression equations. Under the consideration of reverse causation problem, for all five estimated regressions, the estimated coefficients are fixed to the specifications that the explained variable is in subsequent period relative to the explanatory variables. The *t*-statistics (computed by White's heteroskedasticity-consistent standard errors) are shown in the parentheses, and***, ** and * denote that the estimated coefficients reach 1%, 5% and 10% significance level.

Table 9 reports Heckman's two-stage estimation results of regression analysis. For all five regression estimations, at the first stage, a probability model aims to examine which determined sample is in CSR firms or NonCSR firms by using *ASSET* (natural log of current-period total assets), *LDEBT* (last-period debt ratio) and *LPROFIT* (last-period after-tax profits levels) as independent variables. Next, the at the second stage, an inverse Mill's ratio, a selection bias correction term, is added to the regression equations mentioned above. As said before, for results of all five regression, estimated equations are fixed to the specifications that the explained variables are in subsequent period.

For estimated results of the first stage in Table 9, the estimated values of *ASSET*, *LDEBT* and *LPROFIT* are 0.5177, -0.008 and 6.24E-08, all statistically significant, indicating that firms with larger assets, lower debt ratio and higher after-tax profits levels are prone to be CSR firms. Consistent with previous findings in Table 4 and Table 5, CSR firms have larger assets, lower debt ratio and higher profitability.

To begin with, some estimated coefficients of CSR dummies are negative whereas others are significant at the second stage, indicating that doing CSR is related to worse performance. Secondly, most of estimated coefficients of recession dummies are negative, but three of them are significantly negative, indicating that firms perform badly during downturn. Thirdly, four out of five estimated coefficients of cross-product term of CSR dummies and recession dummies are positive, indicating that during recession, CSR firms perform well though these coefficients are not statistically significant. Similarily, our evidence is still insignificant and insufficient to prove that CSR functions as insurance for financial performance during

recession. Finally, for controls, although the estimated result is not fully consistent, it generally shows that firms with larger assets, lower debt ratio, higher research and development expense ratio and higher growth rate of net sales perform well.

Next, we employ Rosenbaum and Rubin's PSM technique to eliminate sample selection bias [60,61,62]. *ASSET* (natural log of current-period total assets), *LDEBT* (last-period debt ratio) and *LPROFIT* (last-period after-tax profits levels) are used as independent variables, focusing on whether CSR firms or NonCSR firms these samples belong to. Next, CSR firms and NonCSR firms are selected as the matched samples according to the closeness of the above estimated probability (propensity scores). However, using PSM gives rise to the problem of sample reduction after matching. Similarly, Shen and Chang (2009) also describe the disadvantages of using PSM in their study. [21].

Based on after-matching samples, Table 10 reports the OLS results of regression analysis on the relationship among firms' financial performance, CSR, control factors and three cross-product terms. According to our analysis, most of the estimated coefficients of CSR dummies are positive but insignificant, most of the recession dummies are negative and insignificant, and most of coefficients of product term of CSR dummies and recessions are positive but still insignificant. The findings reveal three phenomena. First of all, when adopting matching methods, doing CSR has very little positive effects on performance. Secondly, during recession, firm's decreasing performance is not serious. Finally, doing CSR has little positive effects on financial performance during downturn.

Table 10 Regression Results with use of Propensity Score Sample Matching

Explanatory Variables	Explained Variables				
	ROA	***ROE***	***ROS***	***OPERA***	***EPS***
Constant	2.1004 (1.16)	5.0791 (1.60)	8.8061 (1.41)	15.761 (1.89)	1.1501 (2.10)
D_{CSR}	0.0754 (0.37)	0.0312 (0.06)	0.0090 (0.01)	-0.1002 (-0.10)	0.0357 (0.50)
D_{RES}	-0.1715 (-0.63)	-0.4432 (-0.93)	-0.4373 (-0.47)	0.0785 (0.07)	-0.0869 (-1.09)
D_{CSR} *D_{RES}	0.2460 (0.66)	0.6494 (1.01)	0.3743 (0.29)	-0.0056 (0.00)	0.1332 (1.23)
ASSET	-0.0431 (-0.41)	-0.2096 (-1.11)	-0.4542 (-1.10)	-0.7563 (-1.52)	-0.0459 (-1.41)
DEBT	-0.0027 (-0.38)	0.0135 (1.08)	0.0108 (0.33)	-0.0107 (-0.21)	0.0004 (0.15)
RD	0.0372 (1.11)	0.0488 (1.03)	0.0076 (0.06)	-0.0856 (-0.55)	-0.0148 (-1.55)
SALESG	0.0011 (0.40)	0.0020 (0.44)	-0.0060 (-0.55)	-0.0116 (-1.05)	0.0007 (0.71)
LAG(1)	0.6962*** (15.7)	0.6253*** (7.49)	0.9472*** (21.4)	0.8222*** (7.54)	0.5871*** (10.9)
Num. of Obs.	360	365	365	364	347
Adj. R-square	0.6085	0.5019	0.8861	0.7255	0.5316

Notes:
Using Rosenbaum and Rubin's (1983, 1985a,b) Propensity Score Matching (PSM) to correct for sample selection bias [matching variable are *ASSET* (natural log of current-period total assets), *LDEBT* (last-period debt ratio) and *LPROFIT* (last-period after-tax profits levels)], this table reports results of the pooled OLS estimation of relating firm's financial performance measures to CSR, the control factors and one-period lag dependent variable, *LAG(1)*. The explained variables are five firm's

performance measures, *ROA*, *ROE*, *ROS*, *OPERA* and *EPS*. D_{CSR} is a dummy which is equal to 1 if sample is a CSR firm, and 0 if otherwise. D_{RES} is a dummy which is equal to 1 if sample is in recession and 0 if otherwise. D_{CSR}*D_{RES} is a cross-product term. Other control factors are *ASSET*, *DEBT*, *RD*, *SALESG* and 17 industry dummies (not report them in the table). Under the consideration of reverse causation problem, for all five estimated regressions, the estimated coefficients are fixed to the specifications that the explained variable is in subsequent period relative to the explanatory variables. The *t*-statistics (computed by White's heteroskedasticity-consistent standard errors) are shown in the parentheses, and***, ** and * denote that the estimated coefficients reach 1%, 5% and 10% significance level.

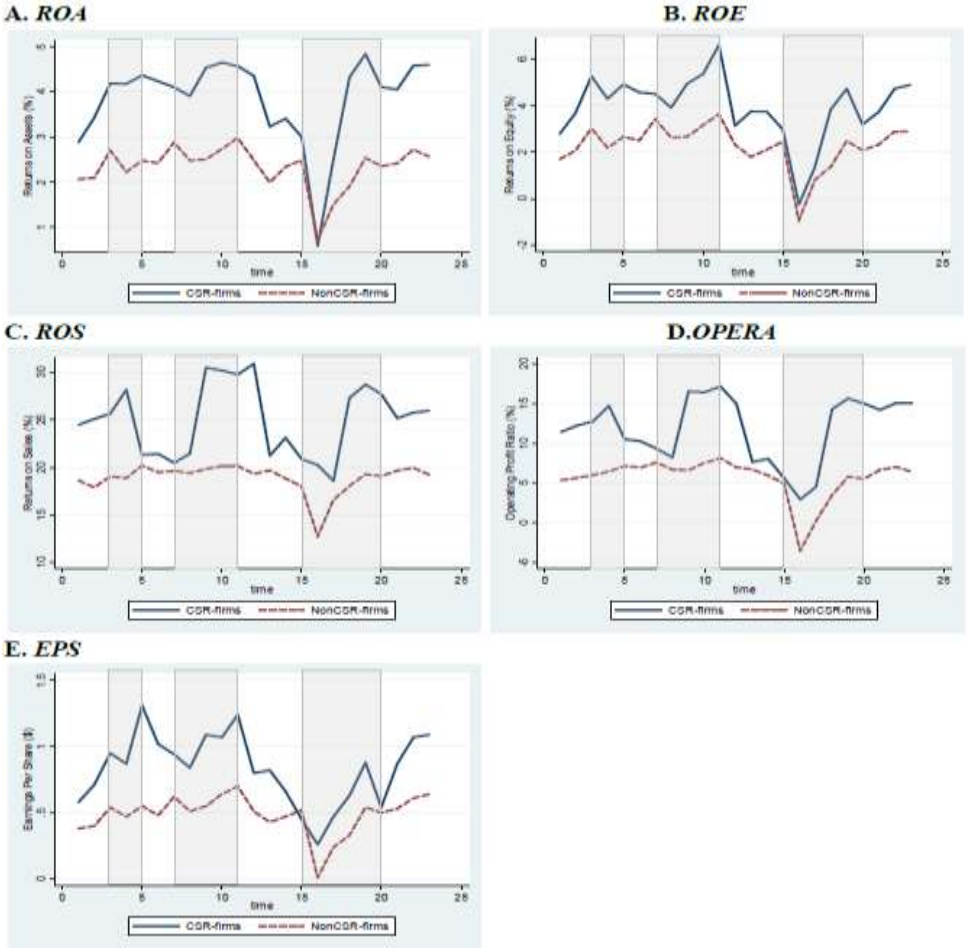
To sum up, our findings revealed that the evidence of CSR's insurance function is neither consistent nor significant. Generally, we found that doing CSR might help improve performace and that during recession the performance will go down, but we cannot find significant evidence of whether CSR would strengthen the performance during recession, as opposed to NonCSR firms.

In addition, the paper aims to examine whether CSR firms outperform NonCSR firms over time, and specifically, during recessions. Table 11 reports time trend of financial performance of CSR and NonCSR firms. We mark the periods of macroeconomic recession by gray color, such as 2005Q3~Q4, 2006Q3~2007Q2 and 2008Q3~2009Q3. Our findings revealed that for ROA, in normal time of 2005Q1 and Q2, CSR firms outperform NonCSR firms (2.88 versus 2.06 and 3.43 versus 2.09, respectively), in spite of statistical insignificance of their difference. In recession of 2005Q4, CSR firms outperform NonCSR firms (4.18 versus 2.22), and their differences become larger and significant. Our findings revealed that CSR firms outperform NonCSR firms during economic downturn.

Unfortunately, if we observe how CSR firms outperform their NonCSR counterparts, we found that the results are not consistent. For example, during normal time, such as 2006Q1 and Q2, CSR firms have significantly superior performance, but during recession such as 2006Q3 and Q4, the relative superiority of CSR firms becomes insignificant. Regardless of which performance measure is used, CSR firms outperform NonCSR firms. However, only when performance measures are *ROS* and *OPERA*, the relative superior performance of CSR firms in recession is larger than in normal time (6.43 versus 5.82, 6.29 versus 6.10, respectively). To sum up, through time series pattern of performance, we found insufficient evidence of the fact that CSR firms outperform NonCSR firms in recession.

Fig. 1 is plots of time series pattern of financial performance of CSR and NonCSR firms. Similar to the results in Table 11, regardless of which performance measure is used, CSR firms outperform NonCSR firms for most of the time. But when observing their performance differences during normal time and during recession, we cannot reach a consensus that CSR firms have larger advangate during recessions. Thus, we still got insufficient evidence that CSR firms outperform NonCSR firms during recessions. Thus, we partially prove that CSR has insurance-like protection for firms' performance.

Fig. 1 Time-Series Pattern of Financial Performance of CSR and NonCSR firms



This figure plots time series pattern of average five performance measures for CSR firms and NonCSR firms and their differences. The macroeconomic recessions are painted by gray area, where the definition of recession is referred to the Business Indicator constructed by Council for Economic Planning and Development in Taiwan.

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Table 11 Time Trend of Financial Performance of CSR- and NonCSR-firms

Period	Performance Variables														
	ROA			ROE			ROS			OPERA			EPS		
	CSR	NCSR	Diff.	CSR	NCSR	Diff.	CSR	NCSR	Diff.	CSR	NCSR	Diff.	CSR	NCSR	Diff.
2005Q1	2.88	2.06	0.82	2.78	1.69	1.09	24.48	18.61	5.87	11.41	5.35	6.06	0.58	0.38	0.20
2005Q2	3.43	2.09	1.34	3.68	2.07	1.62	25.09	17.89	7.20	12.22	5.64	6.58	0.71	0.40	0.32
2005Q3	4.19	2.70	1.50	5.26	3.02	2.24	25.64	19.05	6.59	12.74	6.00	6.73	0.95	0.54	0.41*
2005Q4	4.18	2.22	1.96*	4.29	2.18	2.11*	28.17	18.86	9.31	14.70	6.43	8.27	0.87	0.47	0.40*
2006Q1	4.37	2.47	2.12***	4.91	2.65	2.69***	21.31	20.19	2.28	10.52	7.13	4.28	1.31	0.55	0.83**
2006Q2	4.24	2.42	1.82**	4.57	2.50	2.07*	21.41	19.48	1.93	10.26	6.96	3.29	1.02	0.48	0.54**
2006Q3	4.11	2.88	1.23	4.50	3.42	1.08	20.47	19.62	0.85	9.30	7.57	1.74	0.94	0.62	0.32
2006Q4	3.91	2.47	1.53	3.91	2.62	1.56	21.44	19.39	1.49	8.22	6.67	1.60	0.84	0.51	0.35*
2007Q1	4.54	2.50	2.04**	4.94	2.66	2.28**	30.50	19.83	10.68*	16.54	6.61	9.93**	1.09	0.55	0.54***
2007Q2	4.66	2.73	1.93**	5.37	3.16	2.21**	30.21	20.15	10.06	16.41	7.52	8.89*	1.07	0.64	0.43**
2007Q3	4.58	2.98	1.60*	6.61	3.62	2.99**	29.77	20.14	9.63	17.17	8.12	9.05*	1.24	0.70	0.54**
2007Q4	4.36	2.48	1.89***	3.14	2.31	0.83	30.89	19.31	11.57*	14.98	6.97	8.02*	0.80	0.51	0.29
2008Q1	3.23	1.99	1.24	3.75	1.79	1.96*	21.23	19.68	1.56	7.66	6.71	0.95	0.82	0.43	0.39
2008Q2	3.41	2.34	1.07	3.74	2.11	1.62	23.13	18.82	4.31	8.05	5.94	2.11	0.66	0.47	0.19
2008Q3	3.00	2.48	0.52	2.98	2.44	0.54	20.88	18.01	2.89	5.58	4.91	0.68	0.45	0.52	-0.07
2008Q4	0.58	0.70	-0.12	-0.25	-0.96	0.72	20.24	12.68	7.55	2.91	-3.54	6.46	0.26	0.01	0.25
2009Q1	2.50	1.50	0.99	1.33	0.79	0.54	18.58	16.58	2.00	4.51	0.22	4.29	0.47	0.24	0.23
2009Q2	4.33	1.90	2.43**	3.83	1.36	2.46*	27.31	18.04	9.27	14.28	3.45	10.83*	0.63	0.33	0.29
2009Q3	4.85	2.53	2.32**	4.73	2.48	2.25**	28.72	19.27	9.45	15.65	5.80	9.85*	0.88	0.54	0.33**
2009Q4	4.11	2.35	1.76	3.19	2.08	1.11	27.70	19.07	8.63	15.02	5.51	9.51*	0.54	0.50	0.05
2010Q1	4.06	2.41	1.65**	3.72	2.32	1.39**	25.18	19.66	5.52	14.21	6.62	7.59*	0.87	0.53	0.34**
2010Q2	4.59	2.72	1.87**	4.73	2.88	1.85**	25.76	19.93	5.83	15.05	7.02	8.03*	1.07	0.61	0.46***
2010Q3	4.61	2.56	2.05**	4.89	2.89	2.00**	25.94	19.22	6.73	15.05	6.39	8.66**	1.09	0.64	0.45***
Average (Full Period)	3.86	2.33	1.53***	3.94	2.26	1.67***	25.0	18.8	6.11***	11.85	5.65	6.19***	0.83	0.49	0.35***
Average (Recession)	3.71	2.24	1.48***	3.72	2.11	1.61**	24.7	18.3	6.43***	11.0	4.69	6.29***	0.77	0.45	0.32***
Average (Normal Time)	3.99	2.41	1.58***	4.14	2.41	1.73***	25.2	19.3	5.82***	12.6	6.53	6.10***	0.89	0.52	0.38***

Notes:
This table reports time series pattern of average five performance measure for CSR firms and NonCSR firms and their differences. The numbers are in percentage term. The macroeconomic recessions are marked by gray area, where the definition of recession is referred to the Business Indicator constructed by Council for Economic Planning and Development in Taiwan. The *t*-statistics for performance differences are also shown, and***, ** and * denote that the differences of two sample means reach 1%, 5% and 10% significance level.

Next, based on the sample classification of CSR firms and NonCSR firms during normal time and recession, we obtain four quadrants of our samples. Namely, they are CSR firms in normal time, NonCSR firms in normal time, CSR firms under recession and NonCSR firms under recession. If engaging in CSR improves performance, CSR firms perform better under both conditions. More importantly, if CSR can function as a insurance-like protection, the performance differnces between CSR firms and NonCSR firms should even be larger under recession, as opposed to those under normal time.

Table 12 summarizes statistics for five performance measures of CSR firms and NonCSR firms under normal time and recession. We observe that for *ROA*, the means of CSR versus NonCSR firms under normal time are 4.125% and 2.402%, and their difference is significantly positive (1.723), indicating that CSR firms perform better during normal time. During recession, CSR firms still have the tendency to significantly outperform NonCSR firms (3.696% versus 2.216%), but its magnitude is reduced from 1.723 in normal time to 1.184 in recession. This means that although CSR firms always outperform NonCSR firms, on average, the degree is rather reduced under recession. If CSR acts as insurance for performance during economic downturn, the degree of the performance difference in these two macroeconomic statuses should be larger. However, now we get contradictory evidence.

Table 12 Differences of Financial Performance between CSR- and NonCSR-firms during Normal Time and Recession

Performance Variable	Statistics	Normal Time			Recession		
		CSR	NonCSR	Diff. in Mean	CSR	NonCSR	Diff. in Mean
ROA	Mean	4.125	2.402	**1.723*****	3.696	2.216	**1.481*****
	St.dev	2.458	2.438		2.711	2.635	
	Min	-0.770	-6.930		-2.940	-6.930	
	Max	10.77	11.680		10.47	11.63	
ROE	Mean	4.285	2.391	**1.894*****	3.719	2.066	**1.653*****
	St.dev	3.252	4.239		3.643	4.625	
	Min	-12.33	-21.94		-12.27	-22.06	
	Max	16.23	26.57		12.23	27.30	
ROS	Mean	25.37	19.32	**6.044*****	24.45	18.27	**6.178*****
	St.dev	16.28	16.12		17.19	17.04	
	Min	4.380	-53.42		-36.77	-53.29	
	Max	60.18	98.22		60.05	97.91	
OPERA	Mean	13.00	6.525	**6.477*****	10.80	4.578	**6.220*****
	St.dev	13.05	14.59		14.40	16.78	
	Min	-1.250	-116.8		-43.73	-122.1	
	Max	46.85	98.61		43.26	97.01	
EPS	Mean	0.939	0.518	**0.422*****	0.771	0.445	**0.326*****
	St.dev	0.650	0.738		0.640	0.766	
	Min	-1.300	-2.010		-1.790	-1.980	
	Max	3.520	3.710		2.700	3.710	

Notes:
This table reported summary statistics for five performance measures of CSR firms in normal time, NonCSR firms in normal time, CSR firms under recession and NonCSR firms under recession. The *t*-statistics for performance differences are also shown, and***, ** and * denote that the differences of two sample means reach 1%, 5% and 10% significance level.

To sum up, the findings revealed that, generally, doing CSR improves financial performance and that during recession, the performance decreases. However, the result of CSR firms outperforming NonCSR firms during recession is not statistically confirmed. Through time series pattern of performance also shows similar results. Thus, generally, through regression analysis and group comparisons, we have incomprehensive and insignificant evidence of CSR as insurance-like protection of financial performance during recession.

8. Conclusion and Implications

The empirical literature about the relationship of corporate social responsibility (CSR) to financial performance (FP) is well-documented but far from reaching consensus. While most of research examines whether CSR activities generate positive or negative effects on financial performance, few is discussing the appropriate time when firms gain (or lose) if they engage in

CSR actions. Some studies examined that through accumulating reputation, doing CSR could not only provide benefits but mitigate harm during negative shocks [1,22,63,74]. CSR can act as an insurance-like protection of company's financial performance or value.

Based on the data of TWSE-listed companies during 2005Q1~2010Q3, by means of regression analysis, we found that CSR firms outperform NonCSR firms during recession. The findings revealed that during our sample period, firms with CSR perform better, but that during recession, all firms perform worse, indicating that the degree of performance superiority of CSR firms becomes larger but insignificant. Thus, regression evidence partially supports that firm's social behavior strengthens advantage during economic downturn. While doing CSR brings positive feedback during normal time, its advantage is even more salient during abnormal period.

Daily philanthropic and responsible behaviors play a role in enhancing corporate reputation and reducing financial negative impact of adverse accidents. According to Minor (2010), companies viewed as bearing poor CSR suffered stock declines twice the size of those viewed as having strong CSR [22]. Consumers' purchase intentions were also twice as high for products of companies with a strong CSR reputation as compared with those with a poor CSR reputation following a product recall. Although previous research focuses on whether doing CSR provides "visible" benefits, CSR still increases value, which is "invisible" until negative events occur. So, in spite of the fact that many previous studies advocate the neutral or insignificant relationship between CSR and financial performance (FP), the insurance value of CSR still justifies its merits of investment. Thus, most companies are willing to spend time and money on CSR. For instance, firms' engagement in social behaviors includes taking care of employee welfare, donating to the persons or areas in need, paying great attention and efforts to the environmental protection, and ensuring product safety and healthy. This engagement in CSR shows commitment to the public and builds company's reputational asset. This reputation asset acts as insurance to lessen the degree of corporate profile injuries.

In this study, however, there are three limitations. First of all, we define negative events according to our calculation of macroeconomic status. Future research could employ different design. Second, the measurements of firms' CSR activities are 1 or 0 dichotomy by a dummy variable. It has the risk of being arbitrary, so continuous ratings are suggested for future research. Third, like what Godfrey, Merrill, and Hansen (2009) suggest, identification of different kinds of CSR activities helps to examine whether the significance and magnitude of insurance value of CSR is essential [63]. Therefore, future research could include examining the value of insurance-like protection during firm's negative events [22,63]. Thus, various CSR activities are suggested to be examined in details to discover their impacts on insurance value.

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