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THE IMPACT OF CORPORATE SOCIAL RESPONSIBILITY ON PERFORMANCE IN THE FINANCIAL INDUSTRY

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ABSTRACT

Much of the previous literature that has studied the impact of corporate social responsibility (CSR) on performance has reached inconsistent conclusions, and studies on the determinants of CSR are rare. Most of the previous literature has not compared the efficiency and productivity of companies with and without CSR, and other related research has often focused on shorter time periods. In light of this fact, this study compiles empirical data from the financial industry in Taiwan between 2007 and 2016. The Common Wealth magazine's "Corporate Citizenship Award TOP 50", was used, which lists the OTC company's four indicators and the total score for the cross-industry analysis. Second, we constructed a panel data model of the impacts of CSR and corporate governance on operation performance, adopting other multi-variable considerations. We then used data envelopment analysis (DEA) and Malmquist productivity index (MPI) to analyze the differences in efficiency and productivity. Finally, we examined the factors that affect the willingness of enterprises to invest in CSR.

Contribution/Originality: The research studies the impact of corporate social responsibility (CSR) on performance by comparing the efficiency of companies with and without CSR in the finance industry. The results of this research can be incorporated into managerial practices, in order to improve and increase the business performance and efficiency of companies.

1. INTRODUCTION

In an era of tremendous change in the global economy and environment, fulfilling CSR helps companies to develop operations and share sustainable values with stakeholders.[1] When a company pursues profitability, is it possible for that company to return certain profits to society, while improving their performance? This question is certainly worthy of further exploration. In 2005, Taiwan Global Views Monthly and CommonWealth Magazine held CSR awards and, in 2007, the World Corporate Citizen Awards were held. Considering corporate governance, corporate commitment, social participation, environmental protection, and other indicators, Tianxia Magazine

[1]About the empirical studies of CSR, please refer to Yusoff, Mohamad, and Darus (2013); Lu, Wang, and Lee (2013); Cavaco and Crifo (2014); Eabrasu (2015); Chen (2015); Oh and Park (2015); Angelia and Suryaningsih (2015); Ye (2016); Rhou, Singal, and Koh (2016); Nor and Zawawi (2016); Arouri and Pijourlet (2017); Matuszak and Różańska (2017) and Mishra (2017).

selected new valuable enterprises, while advocating for enterprises to be responsible citizens as well as profitable tools. In addition, according to the 2008 CSR survey report by the University of Chicago Business School, 65.7% of consumers are willing to recommend the top 20 CSR companies to others, which is much higher than the figure of 25.9% in last year's CSR rankings. This shows that, the higher the level of CSR input, the higher the consumer's evaluation, and the more successful the company. It can be said that, whether locally or globally, it is important for enterprises to fulfil CSR while improving their business performance.

There is also a certain correlation between corporate governance and CSR. If a well-established corporate governance mechanism is constructed, this will help enterprises implement social responsibility. In the past, there have been many instances of financial fraudulence in large domestic enterprises, such as Donglong, Boda and Liba. However, it can be said that there are many shortcomings with their corporate governance. The Taiwan Stock Exchange and Asian Corporate Governance Association have evaluated corporate governance using corporate governance indicators. Furthermore, the public information observatory has a corporate governance zone where company-related information can be clearly disclosed. The financial industry plays a leading role in the economy of a country, as it is closely related to economic development. social stability, and the influence of CSR on social contribution. Unlike other industries, the banking industry holds investor deposits, which means that it is closely tied to the interests of the general public. In fact, financial service-related companies are selected for the World Corporate Citizen Award every year. Therefore, as industries are currently increasingly concerned about CSR, the banking industry will become an important driver of CSR issues, which will affect other industries (Chi & Chen, 2004). As corporate governance is an important factor in improving the economy and enhancing the competitiveness of enterprises, the impact of the implementation of CSR on company performance is an issue worthy of further discussion.

In an empirical study on CSR and company performance between 2006 to 2008, Cai (2010) explores CSR on financial performance and economic indicators, using award-winning Taiwanese and American companies as examples. The empirical results showed that CSR and corporate financial performance are not entirely positive. Yusoff et al. (2013) explored the potential impact of the CSR structure on companies' financial performance. Based on stakeholder perspectives, a sample survey of 30 leading companies listed on the Bursa Malaysia exchange was conducted between 2009 to 2010. Lu et al. (2013) have also explored the relationship between CSR and company performance in the semiconductor industry in the United States (US) between 2004 and 2008. The results showed that, in the short-term, the performance of companies that have implemented CSR is lower than those who have not. The reason for this poor business performance is that enterprises accumulate greater responsibilities and higher costs when implementing CSR. Oh and Park (2015) explore the relationship between CSR and Korean companies' financial performance using a sample of 200 of the highest performing companies in terms of CSR over seven years, between 2004 and 2010. The research has shown that CSR has varying effects on corporate financial performance. Depending on the characteristics of each industry, companies should emphasize their strategic direction in order to improve CSR, as well as their profitability and growth. Chen (2015) explores the impact of corporate governance and CSR on corporate performance. Using Taiwan's food industry as an example, the results show that the relationship between CSR and corporate performance is negatively correlated. Angelia and Suryaningsih (2015) explored the impact of environmental performance and CSR disclosure on financial performance by studying companies in the manufacturing, infrastructure and service industries that were listed on the Indonesia Stock Exchange between 2012 and 2013. After reviewing the aforementioned research, it can be seen that, in most studies, the research periods are not long enough, only a single industry is discussed, and the conclusions about the implementation of CSR are inconsistent.

The subject of corporate governance originated in the US in the 1930s. Asian countries followed suit after the 1997 financial turmoil, as countries in Asia called for corporate organizations to pay attention to corporate governance systems. The main implication of this was to enable enterprises to effectively monitor their

organizational activities and improve organizational operations, in order to achieve CSR goals through legal checks and balances. The International Organization for Economic Co-operation and Development (OECD) proposed the principle of corporate governance in 2004: "The corporate governance structure should be consistent with the laws and regulations, and clearly define the rights and responsibilities of different units to make the market more transparent, more efficient and fairer to all. Shareholders, interested parties, etc." Denis (2001) found that, under the establishment of appropriate corporate governance mechanisms, it is indeed possible to effectively reduce managers' actions to undermine shareholder value. Chitan (2012) explores the impact of corporate governance and banking performance in the Romanian banking industry between 2004 to 2011. Studies have shown that the impact of bank performance differs from the development of banks, as there are more stringent requirements in terms of equity and the establishment of relevant default debtor regulations to limit risks and improve financial performance. Zhang (2014) explores the relationship between corporate governance mechanisms and the business performance of Taiwan-listed companies in the electronics industry between 2008 to 2012. The empirical results have shown that the shareholding ratio of major shareholders, directors, and supervisors is not significantly correlated with return on assets (ROA). Chen (2015) explores the impact of corporate governance and CSR on the performance of Taiwan's food industry from 2004 to 2012. The empirical results have shown that the company's performance is better when the size of the board and the director's shareholding ratio is larger. Chen (2015) explored the impact of corporate governance on a company's performance in the food industry between 2006 and 2013. The empirical results show that the directors' (supervisory) shareholding ratio and earnings per share (EPS) are positively and significantly correlated. Nor and Zawawi (2016) explored whether or not there is an optimal board structure using an evolutionary algorithm to analyze the FTSE Bursa Malaysia Composite Index between 2006 and 2009. The research results indicated that, in terms of return on equity (ROE) and EPS, the results were not significant, even though the company with a superior board outperformed the sample of companies with inferior boards.

The majority of the literature on the impact of CSR on performance has reached inconsistent conclusions, and studies on the determinants of CSR are rare. Moreover, the majority of previous literature has not compared the efficiency and productivity of companies with and without CSR, and research has often focused on shorter time periods. In light of this fact, this study compiles empirical data from the financial industry in Taiwan between 2007 and 2016. The CommonWealth magazine's "Corporate Citizenship Award TOP 50", was used, as it lists the OTC company's four indicators and the total score for the cross-industry analysis. Second, we constructed a panel data model of the impacts of CSR and corporate governance on operation performance, adopting other multi-variable considerations. We then used data envelopment analysis (DEA) and the Malmquist productivity index (MPI) to analyze the differences in efficiency and productivity. Finally, we examined the factors that affect the willingness of enterprises to invest in CSR.

2. DATA SOURCES, VARIABLES, AND THE EMPIRICAL MODEL

2.1. Data Sources

The CommonWealth Magazine invites public companies that have been supervised by the Financial Supervisory Commission (FSC) for three consecutive years (2014-2016) to take part in a survey of the 2000 best vendors; experts and scholars recommend local and foreign companies in Taiwan to participate. The vendors are divided into four groups: large-scale enterprises, backbone enterprises, foreign-invested enterprises, and small giants. The experts select the top 100 companies in four categories: corporate governance, corporate commitment, social participation, and environmental protection.

This study has selected the Taiwan-listed companies that have won the World Corporate Citizen Award from the CommonWealth Magazine since 2007 as the research sample. Then, an unselected company from the same industry as the award-winning enterprise is used as a sample for further comparisons and discussions. The time period of this study was from the first quarter of 2007 to the fourth quarter of 2016, which is a total of 40 seasons.

The total number of CSR-winning listed companies is 96, nine of which are in the financial industry. Another nine unselected firms were chosen, in order to create a total of 18 firms. Since the database of the Taiwan Economic Journal (TEJ) does not contain foreign companies, this study excludes foreign companies, as well as samples with insufficient study periods and data defects. The sources of this research are TEJ, the CommonWealth Magazine and the Market Observation Post System of Taiwan.

2.2. Variable Definitions

2.2.1. Input and Output Terms of DEA

The DEA variables in this study refer to the variables used in past scholars' research, which have been used as the basis for selecting input and output items.[2]

The input items are the number of employees, operating expenses, and fixed assets; the output items are operating income and interest income. For a description of each variable, please refer to Table 1.

Table 1. Input and output variables of the non-financial industry

Terms	Variable	Definition of Variables
	Total assets	Refers to resources formed by past transactions or events that are owned or controlled by the enterprise and are expected to bring economic benefits to the enterprise.
	Operating costs	Refers to the cost incurred when selling goods or providing labor services due to regular business activities during the period.
Input terms	Total shareholders' equity	Refers to the company's own funds; the total assets are deducted from the net residual value of liabilities.
	Number of employees	Refers to the total number of employees in the company.
	Return on total assets	Refers to the ratio between the profit before interest, the taxes of the enterprise, and the average total assets.
	Return on equity	The company creates profitable efficiency for overall shareholder funds.
Output terms	Operating income	Refers to the income from sales of goods or the provision of labor services during a period due to regular business activities. The gross profit of the business is deducted from the sales returns and discounts.
	Net profit after tax	Refers to the net profit after tax minus the income tax, which is the final surplus of the company.

Source: Taiwan Economic Journal (TEJ).

2.2.2. Variables of the Panel Data Model

(1) Exploring the variables of corporate governance and CSR on business performance

A. Dependent Variables

a. ROA: The higher the ROA, the higher the profit on behalf of the overall assets.

b. ROE: The higher the ROE, the higher the profit that the company earns for shareholders.

c. EPS: A high EPS represents the relatively high profitability of the company's capital per unit; therefore, the better the company's profitability, the worthier of investment they are.

(2) Independent Variables

B. CSR

For a dummy variable, the company that was selected as the World Corporate Citizen Award was 1 and the unselected company was 0.

[2] See Fang (2010); (Chen., 2014); Wang (2015) and Mihir and Christabel (2012) for the details.

C. Corporate Governance Variables[3]

a. Whether or not the chairman is concurrently the general manager (*Dual*): This is a dummy variable — if the chairman has a concurrent general manager, the value is one, otherwise it is 0. Rechner and Dalton (1991) found that having a chairman and general manager can produce a better financial performance. In Pi and Timme's (1993) study, it was found that, when banks separate the positions of chairman and general manager, they will have lower asset costs and higher asset returns.

b. Board size (*Bodsize*): The size of the board of directors referred to in this study is the total number of board members. Bacon (1973) believes that, the greater the size of the board, the better able it is to carry out its supervisory function.

c. Major shareholding ratio (*Bighold*): The major shareholder defined by the competent authority; in other words, the shareholder who holds more than 10% of the shares but does not hold the position of director or supervisor. Agrawal and Mandelker (1987) have pointed out that, when equity is concentrated on certain major shareholders, the greater the majority of shareholders, the more incentives there are to supervise the management, thereby increasing the value of the company.

d. Director's shareholding ratio (*Dirhold*): The ratio of the number of shares held by directors to the number of shares outstanding. Lu. (2011) has pointed out that the higher the shareholding ratio of directors, the greater transparency of information disclosure in financial statements.

e. Supervisor's shareholding ratio (*Inshold*): The ratio of the number of shares held by the supervisor to the number of outstanding shares. Xie (1999) pointed out that the higher the shareholding ratio of supervisors, the more consistent with the interests of the shareholders, and the more they are able to carry out their supervisory function.

D. Macroeconomic Variables

a. The composite index of leading indicators (*Index*): The leading indicator composite index predicts future changes in the economy. When the leading indicator reaches its peak or lower limit, it can be expected that the peak will also reach its limit after a certain period of time.

b. Annual real GDP growth rate (*GDP*): When the GDP growth rate is positive, it shows that the region's economy is in an expansion phase and the economy is more active.

E. Fundamental Variables

a. The year the company was established (*Age*): The number of years since the company has been established. Studies by Peng, Zhang, and Li (2007) and Li (2006) have pointed out that a company's age will affect its operating performance.

b. Company size (*Size*): In this study, the size of the company refers to the value of its total assets. Chatterjee and Wernerfelt (1991) pointed out that the size of the firm has a considerable impact on the type of corporate strategy employed. If the scale is larger, it is easier to raise funds.

F. Financial Variables

a. Debt ratio (*Debtratio*): The debt ratio is the ratio of total liabilities to total assets, which is an important indicator for measuring the capital structure of a company. Therefore, the debt ratio can provide an approximation of whether a company is sound.

[3] For issue on corporate governance, please refer to the following literatures: Denis (2001); Huang (2010); Chitan (2012); Chen.. (2013); Zhang (2014); Chen... (2015); and Nor and Zawawi (2016).

(2) Exploring the factors that affect companies' willingness to implement CSR

This study further explores the factors that affect companies' willingness to invest in CSR. Therefore, the following variables have been created: The dependent variable is CSR and the independent variables include ROA, ROE, Age, Size, Debt Ratio, and Capital.

2.3. Description of Research Methods

2.3.1. Panel Data Analysis

A panel data analysis has two different models. The first is the fixed effects model, which is used in situations when the cross-section and time series coexist in different samples with different intercepts. The second is the random effects model, which is used when the cross-section and time series coexist and the intercept is random, meaning that the error term is assumed to be a random coefficient.

2.3.2. Data Envelopment Analysis (DEA)

This study uses DEA to calculate efficiency values. The theory, introduced by Farrell (1957), calculates efficiency using a non-predetermined production function. This efficiency is the input and output value of all decision-making units (DMUs). The spatial relationship between mathematical methods uncovers the boundaries of the best possible points, as long as the DMU falls on the efficiency front. DEA sets its input and output combination as the most efficient, and relative efficiency values range from 0 to 1.

However, a DEA includes CCR and BCC modes. These two modes can be used to judge the scale compensation and other information on efficiency improvement. The CCR model was first proposed by Charnes, Cooper and Rhodes in 1978.

2.3.3. Malmquist Productivity Index (MPI)

The Malmquist productivity index was first proposed by Caves, Christensen, and Diewert (1982) and continued by Fare, Grosskopf, and Norris (1994); it uses the distance function to analyze the Malmquist productivity index. This study uses the MPI proposed by Fare et al. (1994) to measure intertemporal changes in efficiency values.

2.3.4. Logistic Regression Model

In this study, a logistic regression model was used to explore the factors that affect enterprises' willingness to invest in CSR. A logistic model was used to predict the regression of strain number. The value of the strain number is a binary variable, as it either occurs (Y=1) or two results (Y=0) occur. The logistic model considers the probability that each observation produces a specific result on the strain number under the influence of a set of independent variables (Cai. and Wang, 2009).

2.4. Empirical Model

2.4.1. Panel Data Model

$$ROA_{it} = \beta_0 + \beta_1 CSR_{it} + \beta_2 Dual_{it} + \beta_3 Bodsize_{it} + \beta_4 Bighold_{it} + \beta_5 Dirhold_{it} + \beta_6 Inshold_{it} + \beta_7 Index_{it} + \beta_8 GDP_{it} + \beta_9 Age_{it} + \beta_{10} Size_{it} + \beta_{11} Debtratio_{it} + \varepsilon_{it} \quad (1)$$

$$ROE_{it} = \gamma_0 + \gamma_1 CSR_{it} + \gamma_2 Dual_{it} + \gamma_3 Bodsize_{it} + \gamma_4 Bighold_{it} + \gamma_5 Dirhold_{it} + \gamma_6 Inshold_{it} + \gamma_7 Index_{it} + \gamma_8 GDP_{it} + \gamma_9 Age_{it} + \gamma_{10} Size_{it} + \gamma_{11} Debtratio_{it} + \mu_{it} \quad (2)$$

$$EPS_{it} = \lambda_0 + \lambda_1 CSR_{it} + \lambda_2 Dual_{it} + \lambda_3 Bodsize_{it} + \lambda_4 Bighold_{it} + \lambda_5 Dirhold_{it} + \lambda_6 Inshold_{it} + \lambda_7 Index_{it} + \lambda_8 GDP_{it} + \lambda_9 Age_{it} + \lambda_{10} Size_{it} + \lambda_{11} Debtratio_{it} + \tau_{it} \quad (3)$$

The above equations 1–3 represent the panel data model of *ROA*, *ROE* and *EPS*, respectively, and the dependent variables include *ROA*, *ROE*, and CSR (*EPS*). In terms of independent variables, these equations include CSR, *Dual*, *Bodsize*, *Bighold*, *Dirhold*, *Inshold*, *Index*, *GDP*, *Age*, *Size*, and *Debtratio*.

2.4.2. The Logistic Model

$$CSR_{it} = \alpha_0 + \alpha_1 ROA_{it} + \alpha_2 ROE_{it} + \alpha_3 Age_{it} + \alpha_4 Size_{it} + \alpha_5 Debtratio_{it} + \alpha_6 Capital_{it} + \tau_{it} \quad (4)$$

Equation 4 represents the logistic model; the dependent variable is *CSR* and the independent variables include *ROA*, *ROE*, *Age*, *Size*, *Debtratio*, and *Capital*.

3. EMPIRICAL RESULTS AND ANALYSIS

3.1. Analysis of the CommonWealth Magazine's Top 50 Corporate Citizens

This section will use the CSR total score and four index scores of corporate governance, corporate commitment, social participation, and environmental protection, to conduct a cross-industry analysis of listed companies that have received the CommonWealth Magazine Corporate Citizen Award.

3.1.1. CSR Overall Sample Analysis

The industry that have won the World Corporate Citizen Award the most times is the computer industry and peripheral equipment industry, with a total of thirteen firms having won the award. The second highest industry is the semiconductor industry, with a total of twelve firms winning, and the third is the financial industry, with a total of nine firms. Overall, the technology industry (including semiconductors, electronic components, computers and peripherals) accounted for the largest number of award-winning companies.

3.1.2. Total Score Analysis of CSR

The total CSR score of each industry is an average of about 7.5 points. The highest total score was 8.06 points in the steel industry, followed by 7.9 points in the electronic components and communication network industry. The third highest was 7.87 points for the computer and peripheral equipment industry. This shows that these industries have a better CSR performance. The lowest total score was 5.91 points in the rubber industry, which indicates that there is room for improvement in their overall CSR performance.

3.2. Basic Statistics

3.2.1 Descriptive Statistics

This section is divided into a sample of the panel data model, the DEA model for financial and non-financial industries, and the basic statistics of the variables of the logistic model (Table 2). The correlation coefficient analysis of input and output variables can be seen in Table 3.

In Table 2, we observe the descriptive statistics of DEA in the financial industry and other industries. In terms of the number of employees, the average value in non-financial industries is higher than in the financial industry. The standard deviation is also much higher than that of the financial industry. This indicates that the non-financial industry has a large variance in the number of employees. In addition, in terms of operating income, the average value of the financial industry is higher than that of non-financial industries, indicating that the financial industry's operating income is better, although its standard deviation is larger than that of the non-financial industry. This indicates that the performance of the financial industry's operating income will vary greatly, depending on the company.

Table 2. Descriptive statistics of the DEA model for the financial industry.

Input variable	Average	Standard deviation	Minimum	Maximum
Number of employees	11,010.81	10,273.24	1223	47,825
Operating expenses (million)	4,828.09	3,690.073	293	19,385
Fixed assets (million)	20,950.52	17,392.37	1,893	113,346
Output variable	Average	Standard deviation	Minimum	Maximum
Net operating income (million)	69,720.25	133,710.8	1,123	963,407
Interest income (million)	14,076.86	17,235.06	-2459	125,724

Source: Taiwan Economic Journal (TEJ).

3.2.2. Analysis of the Correlation Coefficient

When using the DEA method, the input and output items must follow the same direction. Therefore, this study examines the correlation between selected inputs and outputs. The results show that the selected output items are positively correlated with input items. Therefore, it can be inferred that the selected input and output variables in this study are reasonable and suitable for DEA. The correlation coefficient analysis is presented in Table 3.

Table 3. Analysis of the correlation coefficient in the financial industry.

Variables	Operating income	Interest income	Fixed assets	Number of employees	Interest expense
Operating income	1.0000				
Interest income	0.8838	1.0000			
Fixed assets	0.6962	0.7841	1.0000		
Number of employees	0.8895	0.8000	0.7768	1.0000	
Interest expense	0.7322	0.7412	0.8713	0.8327	1.0000

Source: Taiwan Economic Journal (TEJ).

3.2.3. Test of Optimal Panel Data Empirical Model

This study used the F-test, LM-test and Hausman-test to select the optimal empirical model for financial and non-financial industries. In the ROA model, the financial industry is suitable for the random effects model. In the ROE model, the financial industry is suitable for the random effects model. In the EPS model, the financial industry is suitable for fixed-effect models.[4]

3.3. Empirical Results of the Determinants of Business Performance

3.3.1. Empirical Analysis of the Impact of the ROA Model

As shown in Table 4, the implementation of CSR has not had a significant impact on ROA. This indicates that, in the financial industry, the implementation of CSR is not a key factor that affects a company's operating performance. The chairman of the board of directors concurrently serves as the general manager, which has a negative impact on the ROA. This shows that, when the chairman concurrently serves as the general manager, it is not advantageous for the company's performance. The shareholding ratio of major shareholders and supervisors has had a positive impact on ROA, which indicates the fact that an increase in the shareholding ratio of major shareholders and supervisors can improve a business's performance. The composite index of leading indicators has a positive impact on ROA, indicating that a strong economy can improve the company's operating performance. The annual growth rate of real GDP has had a positive impact on ROA, showing that an increase in the real GDP ratio can improve the company's operating performance. The debt ratio has had a negative impact on ROA, which has a negative impact on the company's operating performance.

[4] As the CSR of this study is an important variable, the data of the fixed effect model cannot be displayed, so it has been replaced by the random effect model.

Table 4. Empirical results of ROA, ROE and EPS models in the financial industry

	ROA		ROE		EPS	
Variable	**Coefficient**	**P-value**	**Coefficient**	**P-value**	**Coefficient**	**P-value**
CSR	0.0552	0.134	0.5155	0.161	0.0827	0.144
Dual	-0.0728	0.473	-0.6828	0.436	-0.0894	0.433
Bodsize	-0.0091	0.048**	-0.1092	0.011**	-0.0163	0.006***
Bighold	0.0033	0.047**	0.0131	0.398	0.0064	0.002***
Dirhold	0.0004	0.753	-0.0026	0.833	0.00004	0.980
Inshold	0.0043	0.052*	0.0217	0.266	0.0072	0.005***
Index	0.0066	0.000***	0.0580	0.000***	0.0118	0.000***
GDP	0.0075	0.001***	0.0386	0.043**	0.0040	0.106
Age	0.0008	0.270	0.0104	0.190	0.0022	0.071*
Size	0.0110	0.726	-0.1375	0.645	0.0975	0.023**
Debtratio	-0.0125	0.000***	0.0113	0.510	-0.0030	0.215
Constant	0.5110	0.065*	-3.1364	0.232	6.2643	0.020**
	R^2 =0.8401		R^2 = 0.4390		R^2 = 0.2413	

Notes: ***, **, and * represent statistically significant levels of 1%, 5%, and 10%, respectively.

3.3.2. Empirical Analysis of the Impact of the ROE Model

As shown in Table 4, the implementation of CSR has not had a significant impact on ROE in the financial industry, indicating that the implementation of CSR is not a key factor that affects the company's operating performance. The size of the board of directors has a negative impact on ROE, which indicates that having a larger board size does not improve the company's operating performance. The composite index of leading indicators has a positive impact on ROE, which showing that a stronger economy can improve the company's operating performance. The annual growth rate of real GDP had a positive impact on ROE, which shows that a rise in the real GDP ratio will boost the company's operating performance.

3.3.3. Empirical Analysis of the Impact of the EPS Model

With respect to the financial industry, the adoption and practice of CSR has not had a significant impact on EPS. This indicates that, for the financial industry, the implementation of CSR is not a key factor that affects a company's performance (Table 4). The size of the board of directors has a negative impact on EPS, which indicates that a larger board size does not contribute to the company's operating performance. The shareholding ratio of the major shareholder and the supervisor has had a positive impact on EPS, which indicates that the shareholding ratio of the major shareholder and supervisor can improve business performance. The composite index of leading indicators had a positive impact on EPS, which showing that a strong economy will improve the company's business performance. The age of the company also had a positive impact on EPS, indicating that the longer the company has been established, the better their operating performance. The size of the company had a positive impact on EPS, which indicates that, the larger the company, the better the company's operating performance.

3.4. Data Envelopment Analysis Empirical Results

Table 5 shows the efficiency of the financial industry through companies that have implemented CSR and those that haven't. The results show that the overall efficiency of the financial companies that have implemented CSR is better than those that have not implemented CSR. The financial companies that have implemented CSR include eight companies that have a total technical efficiency of one, such as Cathay Financial Holdings Company. E.SUN Financial Holdings Company has an efficiency of less than 1. This shows an increase in scale returns, indicating that it can improve its efficiency by expanding the scale. Five companies in the financial industry have not implemented CSR but are generally efficient, including SinoPac Financial Holdings Company. Another four companies, including Chang Hwa Bank, are decreasing in size, which indicates that they can improve their efficiency by reducing in scale.

Table 5. Efficiency of the financial industry, according to the implementation of CSR

Financial industry	Overall efficiency	Pure efficiency	Scale efficiency
Implemented CSR	0.996	1.000	0.996
Not implemented CSR	0.971	0.981	0.989

Note: The numerical values in the table are the financial industry's average

3.5. Empirical Results of MPI

Table 6 shows the MPI values for companies within the financial industry that have or have not implemented CSR. According to the empirical results, the average value of MPI is higher in the companies that have implemented CSR, indicating that companies with CSR are more productive. In the financial businesses that implemented CSR, the specific change that occurred in the MPI of six companies was growth-related, including Taishin Financial Holding Co., Ltd. The main reason for the growth was the increase in the growth rate of production technology, which suggests developments in production technology. On the other hand, three companies, including E.SUN Financial Holdings Company, displayed a decline in productivity. The main reason for this was the decline in the growth rate of technological progress, indicating that these companies require better management efficiency and improved production technologies.

In the financial businesses that did not implement CSR, the MPI indicated growth in five companies, including JihSun Financial Holding Co. Ltd. This growth of production technology led to an increased growth rate, indicating that the aforementioned enterprises have a competitive advantage over other companies in terms of production technology. Furthermore, four companies, including Chang Hwa Bank, showed signs of a declining productivity.

Table 6. The MPI according to the implementation of CSR

Change in	Technical efficiency	Production technology	Pure technical efficiency	Scale efficiency	MPI
Implemented CSR	1.000	1.028	1.001	0.998	1.028
Not implemented CSR	1.000	1.001	1.000	1.001	1.003

Note: The numerical values in the table are the average of the financial industry

3.6. Logistic Model Empirical Results

Table 7 shows the empirical results of the logistic model in financial and non-financial industries. In the financial industry, ROE has a positive impact on CSR, indicating that an increase in ROE can increase the willingness of companies to commit to CSR. The number of years that a company has been established has a negative impact on CSR. This suggests that, the older the company, the lower the willingness to invest in CSR. The debt ratio has a positive impact on CSR, which indicates that, the higher the debt ratio, the higher the willingness of companies to implement CSR.

Table 7. Empirical results of the logistic model in financial and non-financial industries.

	Financial Industries		Non-Financial Industries	
Variables	Coefficient	P value	Coefficient	P value
ROA	0.3624	(0.464)	0.2114	(0.000)***
ROE	0.1168	(0.031)**	-0.0016	(0.708)
Year of establishment	-0.0070	(0.088)*	0.0002	(0.880)
Size	1.5062	(0.000)***	0.6566	(0.000)***
Debt ratio	0.0457	(0.001)***	-0.0026	(0.124)
Paid-up capital	-2.9577	(0.000)***	0.6522	(0.000)***
Constant	14.5430	(0.000)***	-11.1823	(0.000)***
Log likelihood	-433.09497		-3996.7736	
LR chi2(6)	106.99		1359.56	

Note: ***, **, and * represent statistically significant levels of 1%, 5%, and 10%, respectively.

The amount of capital has a negative impact on CSR, indicating that the higher the level of capital, the lower the willingness of enterprises to invest in CSR. The larger the size of a company, the greater the willingness to invest in CSR. This result also suggests that large enterprises have more resources, tolerance and a greater willingness to implement CSR than small enterprises.

4. CONCLUSIONS AND RECOMMENDATIONS

4.1. Conclusion

4.1.1. Empirical Results of the Determinants of Business Performance

The empirical results of the ROA, ROE and EPS models show that the implementation of CSR in the financial industry has not reached a significant level, and that the implementation of CSR on behalf of financial companies cannot improve their performance. This means that the financial enterprises that have implemented CSR have not yet improved their economic performance. In terms of corporate governance variables, the size of the board of directors has a negative impact on financial enterprises, indicating that a board of directors that is too large could be detrimental to the company's performance. Regarding macroeconomic variables, the composite index of leading indicators is positive in the financial industry. The empirical results of the variables imply that, when the national economy is stronger and more prosperous, companies' operating performance can significant benefit.

4.1.2. Empirical Results of DEA

By comparing the financial industry's efficiency in implementing CSR and observing the total technical efficiency, we found that the overall efficiency of the companies that implemented CSR performed better. However, among those that did not implement CSR, a large number of companies presented a decreasing return to scale trend and their efficiency values were relatively poor.

4.1.3. Empirical Results of MPI

We compared the MPI values of financial enterprises that implemented CSR, and it was empirically found that financial companies that implemented CSR had higher average MPI values than the financial companies that did not implement CSR, indicating that companies with CSR are more productive. Second, in order to further compare the MPI values of non-financial industries that have implemented CSR, the results show that a significantly higher percentage of the companies that have not implemented CSR have lower productivity levels than companies that have implemented CSR. Companies that have implemented CSR have a greater MPI change than companies that have not implemented CSR, indicating that companies that have implemented CSR perform better.

4.1.4. Empirical Results on the Factors that Affect a Company's Willingness to Invest in CSR

The higher the levels of paid-in capital of the financial business, the lower the willingness of enterprises to invest in CSR. In terms of the financial ratio variable, the factors that affect the financial industry's investment in CSR are ROE and the ratio of liabilities. In addition, the older the company, the lower the willingness of companies to invest in CSR. Furthermore, in the financial industry, larger companies will have a greater willingness to invest in CSR.

4.2. Suggestions

The empirical results indicate that the implementation of CSR in financial companies cannot improve their performance. In other words, the financial enterprises that have implemented CSR have not yet seen any improvements in their economic performance. Therefore, it is recommended that financial enterprises consider firms from non-financial industries that have implemented CSR, in order to acquire good business results as well as

promoting social responsibility. With regard to the empirical aspects of the DEA efficiency and MPI productivity, the results show that the companies that have implemented CSR in the financial industry are significantly more efficient and productive than those that have not. Although the results of implementing CSR have not yet been directly reflected in the businesses' performance, it has been shown that CSR still contributes to the improvement of business efficiency.

Therefore, it is recommended that companies should be brave when implementing CSR, and relevant government agencies should develop policies to coach, motivate, and promote CSR. In addition to encouraging large companies, the enterprises themselves should have more resources, tolerance, and a higher willingness than small enterprises to implement CSR. Therefore, the relevant government agencies should target companies that are willing to promote CSR in small and medium-sized enterprises (SMEs). For example, policies such as rewards, counseling and subsidies could be used to help SMEs learn to take on social responsibilities as well as financial gain. It is also possible for this to be publicized through the public power. For example, rewarding and encouraging CSR to promote excellent manufacturers will also encourage the public to use CSR-certified companies. This move will contribute to the positive cycle of social, industrial, and economic growth.

Finally, in terms of follow-up research recommendations, this study has focused on one industry, as the standards for the selection of CSR used paired samples. Therefore, it is recommended that future researchers create pairings according to the size of the company. As the data is limited to the TEJ, this article cannot obtain the information from the foreign companies mentioned in the World Corporate Citizenship Award. Therefore, it is recommended that future researchers consider the foreign company that will be discussed, in order to compare the efficiency and productivity of foreign and domestic companies. In addition, as the number of award-winning companies in the electronics industry is significant, future researchers may consider cross-industry comparisons between the electronics industry and the non-electronics industry.

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