



TECHNIUM
SOCIAL SCIENCES JOURNAL

Vol. 35, 2022

**A new decade
for social changes**

www.techniumscience.com

ISSN 2668-7798



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Research on the Relationship between Corporate Social Responsibility and Financial Performance of Chemical Companies

Hongtao Zhang¹, Chuanchen BI²

^{1,2}College of Graduate Study in Management, Khon Kaen University

chuabi@kku.ac.th

Abstract. With the continuous development of social economy, the issue of corporate social responsibility has received extensive attention. At present, many companies directly incorporate social responsibility into their development and operations, and more and more companies have also begun to publish social responsibility reports to disclose their social and environmental information. According to a KPMG survey report, more than 75% of about 4,500 companies in 45 countries and regions around the world have released social responsibility reports. However, the regulatory authorities have not made mandatory requirements on the form of corporate social responsibility report information disclosure, and social responsibility information disclosure is a voluntary behavior of enterprises. It can be found from the social responsibility reports released by companies that most companies selectively disclose positive social responsibility information, but seldom disclose relatively negative social responsibility information in their reports, resulting in a low quality of corporate social responsibility reports. Then, the existing literature has not given a clear answer on the quality of information disclosure in corporate social responsibility reports and what impact it will have on financial performance. In this research, we would try to find some evidence to answer this question.

Keywords. economy, responsibility, financial performance

Research Background

Although more and more enterprises begin to pay attention to the fulfillment of corporate social responsibility, how will the fulfillment of corporate social responsibility affect financial performance? How will the quality of corporate financial performance affect the fulfillment of corporate social responsibility? These issues are all further research needs to be done, especially for the emerging chemical industry, due to the instant nature of information dissemination of chemical companies. Under normal circumstances, if it comes to corporate responsibility, we often associate it with ordinary companies, and chemical companies, have their own characteristics in the process of comparing with traditional companies. However, in general, many chemical companies currently have the shortcomings of lack of ideological understanding and little contribution in fulfilling their social responsibilities. Although many scholars have analyzed the relationship between the fulfillment of social responsibilities and their financial performance, however, for emerging industries such as chemical companies, it

is difficult to learn from them in depth. For this reason, this article conducts a targeted analysis of chemical companies. The author hopes that the research conclusions of this paper can provide reference and reference value for related research in the future, so that chemical companies can pay more attention to and strengthen their own social responsibility performance and create a better social atmosphere.

Research Ideas and Objectives

In the research process, the main research objects of this paper are related companies engaged in the chemical industry, and listed companies are the main research objects to analyze the interactive relationship between their fulfillment of social responsibilities and their financial performance. The specific research process is as follows:

- 1). Summarize and analyze the relevant theories of corporate social responsibility, determine the standards for measuring chemical companies' fulfillment of social responsibility, and lay a theoretical foundation.
- 2). Construct a correlation model of the interaction between chemical companies' fulfillment of social responsibility and financial performance, take the relevant data of chemical companies that have been listed as the sample size, and conduct descriptive statistics and correlation analysis, to draw preliminary conclusion
- 3). Further empirical regression is carried out on the interactive relationship between chemical companies' fulfillment of social responsibility and financial performance, and empirical results are obtained, and the results are analyzed and explained.
- 4). Provide policy recommendations for chemical companies to better fulfill their social responsibilities.

Literature review

1. Connotation of Social Responsibility

In order to carry out the analysis and research smoothly, this paper firstly provides a theoretical overview of corporate social responsibility (CSR). By searching for relevant literature, it is found that according to the research of different scholars, social responsibility can be summarized into the following viewpoints.

Some scholars believe that corporate social responsibility should pay attention to ethical and moral factors. In his research, Oliver (1924)^① first proposed corporate social responsibility, and analyzed and summarized its connotation. He believes that in the process of implementing social responsibility, enterprises must pay attention to ethics and moral-related factors. Some scholars believe that when enterprises fulfill their social responsibilities, they should not only take ethics and morality as an important factor, but also need to add law and economy. This division provides a clear theoretical framework for the study of social responsibility concretization, which is widely adopted by the academic community of social responsibility research. On this basis, some researchers put forward that corporate social responsibility should be analyzed and described from the perspectives of laws and regulations, economic competition, ethics and charity, and that enterprises must take this as an important part of business management in the process of development.

Ellen, Webb and Mohr (2006) ^② believe that enterprise should also consider other factors related to business activities, such as consumers, government, and employees.

2. Connotation of Financial Performance

Based on the analysis of the actual composition of financial performance, the evaluation of financial performance is mainly aimed at financial structure, profitability, operating ability, solvency, and growth ability. Considering the huge size of financial performance indicators, most companies will formulate corresponding indicators based on their own conditions, so as to realize the evaluation of financial performance (Zahra and George, 2002)③. Objectively speaking, financial performance is a response to the development and profitability of an enterprise, and it is also an important part of enterprise management decisions that cannot be ignored. Therefore, the main reasons that affect financial performance include internal environmental factors, which are mainly for the actual situation of internal control, internal management and the development strategy of the enterprise.

3. Research on Financial Performance Evaluation

Klassen and Whybark (1999) proposed in their research that financial performance must include three elements, namely corporate profit, asset profit and owner's equity income. When evaluating a company, one cannot just use one indicator, otherwise it will affect the evaluation results. Perrini et al (2007) spent in her research on financial performance, when enterprises evaluate their own financial performance, they must take the operating efficiency and operating effects of the enterprise as the evaluation factors. Secondly, when evaluating the market value of an enterprise, the market value index is a very important first factor. In order to be able to evaluate the market's benefits, we can use the event analysis method to analyze and summarize it and conduct in-depth exploration and discussion on the problems arising from events. For emergencies, they can be used as a corporate social responsibility impact II carries out in-depth analysis of the factors of financial performance.

Sharma (2000) proposed that this method does not require companies to perform social responsibilities on the impact of their financial performance, but never performs corporate responsibilities to analyze the adverse impact of corporate responsibility, so it can attract people's attention.

Research design

1. Research Method

A quantitative research method is undertaken in this paper to test the research hypotheses. The research sample of this paper is based on the classification of the chemical industry by database and uses the financial data of Shenzhen Stock Exchange and Shanghai Stock Exchange that have been listed and traded before January 1, 2010 to analyze related chemical companies. In order to enhance the academic value of this paper, first of all, the author searches and reads a large number of references, and extracts valuable information from them as the theoretical basis of this paper. Through analysis, it is to find out the key points to be explained in this article, and then based on the interests of the business process, this article will collect relevant information, carry out empirical discussions on each variable analyzed, and finally draw empirical results. In the process of analysis, this paper first takes the theory of interest as the basis, and uses the corporate social responsibility rating score of Hexun.com to quantify the evaluation of corporate social responsibility, and analyze the interaction between its responsibility and corporate performance. deeper research. Finally, through the analysis of the empirical results, the conclusions required by this paper are drawn, and reform suggestions are put forward, which provides an effective basis for better promoting the development of enterprises.

2. Research Hypotheses

Tang and Hull (2011) studied the impact of corporate social responsibility on financial performance from two aspects of accounting indicators and market indicators and found that corporate social responsibility has a positive effect on financial performance. Many scholars have also verified the positive role between the two through research. Hull et al. (2008) take the relevant empirical research literature use the meta-analysis method to conduct a comprehensive statistical analysis of the independent research results. In order to survive and develop in an increasingly complex and comprehensive environment (state democratization, legalization and diversified development), enterprises must fully consider the reactions of stakeholders to corporate social responsibility and the impact of social responsibility on financial performance. Based on this, this paper proposes the following assumptions.

Hypothesis 1 - Corporate social responsibility to employees has a significant impact on financial performance.

Hypothesis 2 - Corporate social responsibility to consumers has a significant impact on financial performance.

Hypothesis 3 - Corporate social responsibility to the community has a significant impact on financial performance.

Hypothesis 4- Corporate social responsibility to shareholders has a significant impact on financial performance.

3. Sample selection and data sources

This paper selects 30 listed chemical industry companies from the chemical industry, such as Luxi Chemical, Sinopec, Jiangnan Chemical, Satellite Petrochemical, and China Chemical, as research samples, and selects the annual report data from 2016 to 2021, and uses SPSS for analysis.

4. Selection of research variables and indicators

Corporate Responsibility Indicator Design - Determine specific indicators for the four stakeholder dimensions, as shown in Table 1:

Table 1 Independent variables of corporate responsibility

Company stakeholders	Independent variable	Formula
Staff (X1)	Salary growth	$(\text{This year's salary} - \text{last year's salary}) / \text{last year's salary}$
Consumer (X2)	Operating cost to revenue ratio	$\text{Operating Cost} / \text{Operating Income}$
Community (X3)	Donation spending ratio	$\text{Donation Expenses} / \text{Net Profit}$
Shareholders (X4)	Capital preservation and appreciation rate	$\text{Ending Owner's Equity} / \text{Beginning Owner's Equity}$

The research model of this paper regards corporate responsibility and corporate performance as a circular management model that affects each other. According to this model, combined with the above assumptions, the following table 2 is established.

Table 2 Explained variables of corporate financial performance

Dimension	Dependent variable	Formula
Enterprise Financial Performance (Y)	Return On Total Assets	EBIT / Average total assets

5. Questionnaire and analysis

On the basis of absorbing and learning from the above research results, combined with the actual problems and market environment faced by the current development of chemical enterprises, the author believes that the evaluation scope of the company's social performance should focus more on the main "vulnerable" stakeholders (including employees, customers, the environment and the community). Therefore, the questionnaire designed in this paper defines four sub-dimensions, including employee social performance, customer social performance, environmental social performance and community social performance, to comprehensively examine the overall social performance of the company. There are four items in each sub-dimension, and a 5-point Likert scale is used to allow the respondents to rate the expression of each item according to the degree of approval - 1 means "strongly disagree", 2 means "disagree", 3 means "generally", 4 means "agree", and 5 means "strongly agree".

Table 1 Questionnaire Design

Subdimension	Questionnaire items
Employee	Compared with similar warehouse industries, chemical companies provide first-class salaries, benefits and working conditions for employees.
	Compared with similar enterprises, the company spends more resources on human resources training.
	There is no prejudice or discrimination in the company's performance evaluation, which can ensure the fairness and impartiality of the evaluation.
	Compared with similar enterprises, the company pays more attention to job creation, and takes more care of disadvantaged groups when recruiting.
Customer	Compared with the food industry, the after-sales service provided by the company is first-class.
	The company has been actively responding to and seriously handling every customer complaint for a long time.
	The company provides customers with real and comprehensive product information in a timely manner, and there is no product fraud.
	The product is reasonably priced and does not take advantage of its position to sell at a high price.
Environment	The company regularly detects and evaluates the impact of production and operation activities on the environment.
	The company has implemented the required energy conservation projects or environmental protection projects.

	The company has made continuous efforts to meet environmental protection standards and has proactively made additional investments for this purpose.
	The company has prepared an environmental report or a sustainable development report and disclosed it to the public in a timely manner.
Community	The existence of the company has greatly improved the local economic situation and development level.
	The company actively sponsors community public welfare activities in community culture, education, art, sports, etc.
	The company encourages managers and employees to actively participate in and devote themselves to social welfare and charity activities, and provides relevant resources for this purpose.
	The company has formulated a corporate ethics code and has been strictly implementing it.

Findings and Discussion

In this paper, data analysis is carried out by selecting the annual financial statements of well-known Chinese chemical companies in the past five years to test whether the hypothesis is true.

1. Descriptive Statistics

Table 3 Descriptive statistics

	N	minimum	maximum	mean	standard deviation
ROE Y	30	-593.61	30.06	-13.87	116.07
Salary growth	30	-4.56	3871.97	180.12	738.98
Operating cost to revenue ratio	30	53.12	113.29	82.85	12.16
Donation spending ratio	30	-2.43	12.18	3.25	2.98
Valid N	30				

According to the above table, it can be seen that the highest return on equity is 30.06%, the lowest is -593.61%, and the average is -13.87%, which shows that there is a huge gap in the overall profitability of chemical enterprises; The difference is large. The maximum salary growth rate of 3871.97% and the minimum value of -4.56% are very different, this is because the scale of the enterprise affects the performance of the enterprise. For example, compared with ordinary listed companies, Sinopec's salary growth rate is floating. The trend is relatively stable, while the ability of ordinary listed companies to take risks is weak, resulting in huge fluctuations in the level of wage growth. The difference between the maximum value of 12.18% and the minimum value of -2.43% of the donation-to-expense ratio is not very large, indicating that the differences in the fulfillment of social responsibilities of chemical enterprises are roughly similar. The highest value of the operating cost to revenue ratio is 113.29%, the

lowest value is 53.12%, and the average value is 82.85%, indicating that each enterprise in the industry has a good execution ability to fulfill the social responsibility of consumers.

2. Correlation Analysis

It can be seen from Table 4 that the wage growth rate is positively correlated with ROE at the level of 1%, and the correlation is 0.031. At the level of 1%, the ratio of donation to expenditure is positively correlated, and the correlation is 0.242. The rate of capital preservation and appreciation is positively correlated at the level of 1%, and the correlation is 0.429. It can be inferred that chemical companies can effectively increase financial performance by fulfilling corporate responsibility to employees, communities, and shareholders. However, since the wage growth rate correlation is 0.033, the effect is not obvious, while corporate responsibility to consumers has a negative impact on financial performance. Among the above correlations, the maximum correlation value is 0.429, which is not in the range of 0.7-0.8, indicating that each variable has no linear relationship, and regression analysis can be performed.

Table 4 Correlation analysis

		ROE Y	Salary growth	Operating cost to revenue ratio	Donation spending ratio	Capital preservation and appreciation rate
ROE Y	Correlation	1				
	Significance					
	N	30				
Salary growth	Correlation	.031	1			
	Significance	.876				
	N	30	30			
Operating cost to revenue ratio	Correlation	-.516	.108	1		
	Significance	.007	.595			
	N	30	30	30		
Donation spending ratio	Correlation	.242	.033	-.321	1	
	Significance	.228	.874	.104		
	N	30	30	30	30	
Capital preservation and appreciation rate	Correlation	.429	-.135	-.123	.087	1
	Significance	.027	.506	.545	.668	
	N	30	30	30	30	30

3. Regression Analysis

It can be seen from Table 5 that the R value of the model is 0.63, the R square is 0.423, and the adjusted R square is 0.318, which is greater than 0.3, indicating that the model fit is qualified and can be used.

Table 5 Fit analysis

Model	R	R- square	Adjust R- square	Standard Estimated Error
	.639	.423	.318	96.00099

Table 6 of 0.03, indicating that there is a significant correlation between the independent variable and the dependent variable.

Table 6 Anovaa

	sum of square	df	mean square	F	Sig.
regression	157156.337	5	36869.085	4.004	.016
residual	222834.214	23	9237.918		
total	350364.573	27			

Table 7 shows that the B value of wage growth rate is 0.023, that is, the company fulfills its corporate responsibility and increases employee performance by 0.023, and the correlation is extremely weak. Values are all greater than 1, which has a significant impact on financial performance.

Table 7 Coefficient

	unstandardized coefficients		standard coefficient	t	Sig.
	standard error	trial version			
(constant)	-35.253	226.733		-.158	.879
salary growth	.023	.025	.135	.799	.434
Operating cost to revenue ratio	-4.446	1.656	-.467	-2.686	.003
Donation spending ratio	2.104	6.657	.058	.319	.758
Capital preservation and appreciation rate	3.387	1.458	.389	2.324	.002

4. Result Analysis

Table 8 Hypothetical result analysis

Hypothesis	Hypothetical content	Hypothetical result
Hypothesis 1	Corporate social responsibility to employees has a significant impact on financial performance.	invalid
Hypothesis 2	Corporate social responsibility to consumers has a significant impact on financial performance.	valid
Hypothesis 3	Corporate social responsibility to the community has a significant impact on financial performance.	invalid
Hypothesis 4	Corporate social responsibility to shareholders has a significant impact on financial performance.	valid

The above research shows that the hypothesis that corporate employees' fulfillment of responsibilities has a significant impact on financial performance does not hold. The reason may be that the current development of chemical enterprises is unbalanced, and the salary level of employees of large companies is relatively stable. However, due to the lack of strength of emerging enterprises, they cannot effectively maintain their performance, resulting in large fluctuations in wage levels. Corporate responsibility to consumers, communities and shareholders has a significant impact on financial performance.

Conclusion

1. Research Conclusion

The results of the above studies show that the financial performance of chemical companies is affected by their social responsibility fulfillment behavior, and the stronger the CSR of chemical companies, the higher the financial performance. And with the attention of external media forces, the degree of improvement in financial performance will be higher. As an important member of the high-pollution industry, chemical enterprises sometimes cause irreversible damage to the environment; However, more fulfillment of social responsibilities can effectively alleviate the negative emotions of the majority of consumers caused by the destruction of chemical companies and establish a positive image of the company. The media has a communication effect. Especially with the prevalence of self-media, various behaviors of chemical companies have attracted much attention. Chemical companies need some CSR behaviors to build a positive reputation for themselves, so as to improve their financial performance.

Data studies have concluded that there is a positive relationship in both directions, that society is profitable and profitable is social, creating a virtuous cycle of positive feedback. The results of this analysis have practical application value in practice, they demonstrate that corporate social responsibility increases corporate financial resources, and vice versa, increased financial performance leads to greater social responsibility. Therefore, the research content of this paper has reference significance for the financial investment of chemical enterprises, has a positive impact on the formulation of corporate strategic investment, improves financial performance, and contributes to the improvement of corporate social responsibility.

2. Recommendations

Since the concept of social responsibility has not been developed long enough in some regions, the corresponding laws and regulations also need to be improved. In social responsibility matters involving companies or legal persons, the specific content of a series of aspects such as labor contracts should have the characteristics of mandatory implementation. Governments at all levels of the country need to take the initiative to improve the specific norms and systems of corporate social responsibility related to employees, creditors and other stakeholders, so as to provide their rights and interests with the best possible and perfect guarantee. For specific stakeholders, government agencies at all levels also need to consider formulating more detailed specifications to achieve management goals that can be followed by rules. Second, government departments must improve the legal system and realize the management and prosecution of legislative matters in this regard. It is necessary to clearly determine the company's specifications in aspects such as carbon emission.

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