

## The Research of CSR Measurement System for Chinese Pharmaceutical Companies: A Delphi Study

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**Abstract:** The Chinese market and Chinese companies are of increasing importance for the global pharmaceutical industry. However, pharmaceutical companies in China have been confronted with persistent and increasing criticisms for the poor quality of medicine, environmental pollution, and practice of commercial bribe in marketing. Along with the increasing call for a higher standard for corporate social responsibility (CSR), there appears a call for construction of a measurement system to help business practitioners in their efforts to take CSR initiatives. This study aims at establishing a CSR measurement system for pharmaceutical companies in China. The Delphi method with a panel of 26 experts holding diverse backgrounds is adopted during the research. Two rounds of interviews are conducted to collect experts' opinions on the candidate indicators of the CSR measurement system. After two rounds of Delphi survey, a CSR measurement system for Chinese pharmaceutical companies is suggested. This three-level system includes eleven stakeholders and 96 indicators. In this study, a CSR measurement system based on stakeholder theory is developed with adoption of the Delphi method. The measurement system could serve as an industry consensus and assist the pharmaceutical companies to conduct business with a greater conscience. The drug administration agency can also use this system as a complementary method to strengthen industry supervision and regulation.

**Keywords:** corporate social responsibility, CSR measurement system, Chinese pharmaceutical industry, Delphi method

### Introduction

China's pharmaceutical market has steadily experienced significant growth in the past few decades, and now it has become the pillar industry for Chinese economic development. According to official statistics from China, the pharmaceutical industry was one of the most rapidly growing industries in China during the "Eleventh Five-year Plan" (2006-2010). The total industrial output value increased to nearly US \$200 billion in 2010, representing more than a 20% growth rate within those five years. The total profit of the pharmaceutical market in China had been increasing at an annual rate of more than 30% percent and reached nearly US \$23 billion in 2010 (CFDA, 2013).

The significance of Chinese pharmaceutical market is also marked by other countries' reliance on it. China has already become an important exporter of pharmaceutical products in the world. The total export value of China's pharmaceutical industry increased from US \$3.4 billion in 1998 to US \$24.6 billion in 2007, and reached US \$39.7 billion in 2010, representing more than a 20% annual increase in the past decade.

European Union customs officials' data shows that China is among the world's top four exporters of counterfeit pharmaceuticals. Besides, more than 40 percent of API used by Americans comes from China and India (Bate & Porter, 2013).

Although China's pharmaceutical industry has achieved outstanding achievement both in scale and quality, the threats and problems cannot be overlooked. China has been plagued by continuous, contemptible incidents in its drug market. Problems such as poor-quality or fake drugs, commercial bribe, and environmental pollution not only impede the sustainable development of Chinese pharmaceutical industry, but also cause damages to consumers' health and life. Meanwhile, people in China always blame the pharmaceutical industry for the high drug price and their insatiable desire for profits.

The reasons behind those accusations and problems are complicated. Many people try to address this problem from the perspective of the government's administration (Yu, Li, & Shi, 2010). They suggest that insufficient supervision, unsound regulation laws and the questionable administration system are responsible for the problems in China's pharmaceutical industry. It is true that pharmaceutical industry is under strict regulation in many countries, and therefore the behaviors of drug companies are highly influenced by governmental supervision (Carroll, 1979). However, it is unrealistic to address these problems by solely relying on government. Firstly, it is impossible for Chinese government to have complete authority on drug companies considering the disproportionate relation between regulation sources and regulation subjects. Secondly, and perhaps the most important one, it is impossible for a government to obtain all accurate information about companies' behavior considering the information asymmetry between government and companies (Wartick & Cochran, 1985). Thus, drug companies themselves should play important role to tackle these problems.

China has put more attention on the concept of corporate social responsibility in recent years. Better social responsibility was supposed to be able to address problems and crises in Chinese pharmaceutical industry (Freeman, 1984; Qu, 2010; Gary, Kouhy & Lavers, 1995). However, despite substantial scholarly and practical attention to CSR in recent years in China, CSR is a relatively new concept for Chinese pharmaceutical companies. Both the research and practice of CSR in China's pharmaceutical industry is limited (Bownan & Haire, 1975). In this paper, a CSR measurement system for pharmaceutical companies is established using the Delphi method. The research results will be helpful for pharmaceutical companies to clarify the essence of CSR and provide a reference for their actions and for their CSR strategy.

## Literature Review

### *Corporate Social Responsibility Measurement*

The concept of CSR is often understood with ambiguity, complexity and multiple dimensions; it is necessary to figure out how to measure and quantify CSR. Thus, the study on measurement of CSR is one of the key components of CSR research. Various models and measurement methods have been developed for CSR measurement research.

**The concept model for CSR measurement.** Various definitions of CSR give rise to numerous theoretical foundations for CSR measurement. In the field of CSR research, some theoretical models play important role for CSR measurement. The first widely used model is developed by Carroll in 1979. He described the CSR as a pyramid. According to his theory, the company should undertake economic, legal,

ethical and discretionary responsibilities (Sirgy, 2002). Carroll suggests that the economic responsibility should be the fundamental responsibility for a company. After that, based on the comprehensive work by Carroll, Wartick and Cochran, the concept of corporate social performance was further developed. Wartick and Cochran introduced a corporate social performance model, which is consisted of principles, processes and policies of CSR activities (Zhang & Song, 2010). This model synthesizes the normative definition of CSR, the empirical process of CSR and the corporate's policies of CSR. Stimulated by this model, many studies on the relationship between corporate social performance and corporate financial performance were conducted, which has already become another important field of CSR study.

The stakeholder theory is now the most popular theory basis for CSR research. Stakeholder can be defined as "any group or individual who can affect or is affected by the achievement of the organization's objectives" (Ingram & Frazier, 1980). Though stakeholder is a concept in strategy research field or organization research fields, its appearance greatly contributed to the development of CSR research. By adopting a stakeholder perspective, it is much clearer who companies should be responsible to, and most importantly, stakeholder theory provides a desirable model for CSR measurement. We can measure CSR once we identify the stakeholders of a company and what responsibilities the company should take for these stakeholders. Compared with other concept models, the stakeholder model is more objective, convenient and straightforward.

**The methods for CSR measurement.** The methods developed for CSR measurement can be divided into five categories: 1) *The content analysis based on corporate annual report*. This method is frequently adopted in accountancy study, which collects information about CSR performance from the company's annual report, like the financial statement or CSR report. For example, some scholars count a company's annual expenditures on environment protection, employee welfare and consumer protection and then use them as the basis for CSR measurement (Aupperle, Carroll & Hatfield, 1985). Other scholars also calculate the proportion of contents that are relevant to CSR behavior in the whole report, which is regarded as a standard for CSR performance (Mignan & Ferrell, 2000; Peterson, 2004).

This method is much more flexible due to its obvious convenience and wide availability of the report, especially considering that more and more companies are inclined to publish their CSR reports to express their attention on CSR activity. However, its defects have also been proven by some studies. The main problem is that this method lacks validity. That is, the contents reported by businesses may not be consistent with the reality since companies could overstate their CSR performance and mislead the public for good reputations (Marquez & Fombrun, 2005; Nussbaum, 2009).

2) *Single index method*. This method emphasizes one aspect of the CSR activities, like the environment pollution index or the labor relationship index. The most representative of this method is "Toxic Release Inventory" (Leisinger, 2009). Using the self-reported information from companies, this index evaluates a company's performance in water resource protection, air pollution and hazardous substance handling. This method is widely used for measuring the CSR performance for manufacturing companies that have higher proclivity to have negative impacts on the environment. The main problem is that the applicability of this method is limited.

3) *Perceptual measurement based on questionnaire survey*. The perceptual measurement method values the stakeholders' perception of the company's CSR performance. In practice, researchers first develop a questionnaire based on different dimensions of CSR. Then, the questionnaire will be used for acquiring the

stakeholder's perception for CSR behavior. The most popular perceptual measurement method was introduced by Aupperle in 1985. Based on Carroll's pyramid of corporate social responsibility, Aupperle developed forced-choice instrument (Esteban, 2007). Maignan's corporate citizenship measurement tools are also part of this kind of method (Shen, Zhu & Shen, 2009).

Many scholars offered criticism on this method. The validity of perceptual measurement is questionable since subjective perception may not reflect the true CSR performance. Specifically, some studies showed that external stakeholders such as customers and environmental groups always underestimate the CSR performance due to their bias, whereas internal stakeholders like an employee or shareholder often overestimate the CSR performance (Leisinger, 2009; Shen, Zhu & Shen, 2009).

4) *Corporate reputation index method.* Corporate reputation index can also be regarded as another version of perceptual measurement since this method also measures CSR performance through subjective perception. The difference between the corporate reputation index method and the perceptual measurement method is that external experts rather than stakeholders are involved in the investigation. The reputation indicators developed by "Fortune" are the ones that are most widely used. The respondents will be required to evaluate company's reputation about their CSR performance using a 10-rating scale (Kong, 2009). Like perceptual measurement method, this method is also not free from subjective bias and the reputation may not reflect the real CSR performance.

5) *Comprehensive evaluation with multiple indicators.* Though there is no agreement on what CSR is, no one will deny that CSR is a concept with multiple dimensions. More and more people and institutions, therefore, measure CSR by using a comprehensive evaluation method with multiple indicators. Many agencies such as KLD, Innovest and PIRC, which are specialized in CSR research, have developed several multiple indicator measurement system. For instance, KLD divides the CSR into eight categories; the former five categories are relevant to the relationships of the company with different stakeholders, like employee, community, environment and consumers. The latter three categories are about global focus points, such as weapons trade, nuclear business and South Africa issues (Kong, 2009). Apart from the research institutions, there are also scholars who prefer evaluating CSR performance with this approach.

By considering the multiple dimensions of CSR, this approach improves the validity of measurement. Other advantages include good comparability, reliable information resources and relatively sound objectivity (Leisinger, 2005). The negative aspect of this approach is rarely discussed in publications, but some researchers have called for attention that this approach probably can give rise to the halo effect (Nussbaum, 2009).

### ***Corporate Social Responsibility Study for Pharmaceutical Industry***

**The characters of CSR for pharmaceutical industry.** Just like the difficulty in a consensus about what is CSR, it is also hard to define CSR for the pharmaceutical industry. On the one hand, pharmaceutical companies share the basic characteristics with companies in other industries. On the other hand, drug companies play a pivotal role in drug availability, accessibility and affordability, which are essential to people's health, and are also characterized by some special aspects different from other industries.

Nussbaum suggests that the unique characteristics of drugs determine that pharmaceutical companies are often considered to have a particular ethical responsibility towards the public (Li, 2010). Leisinger indicates that only pharmaceutical companies take on the particular responsibilities that include research, development,

and production of innovative medicines that make a difference to sick people's quality of life (Kong, 2009). Besides, the 'battle of perceptions' that emerges between the pharmaceutical industry and its complex stakeholder environment of government, media, regulators, patient groups, NGOs, health professionals, and society is also pointed out by Esteban, which means that the proper behavior of pharmaceutical companies probably can be regarded as unethical performance by other stakeholders (Leisinger, 2005). In addition, some scholars also analyzed the characteristics of CSR for pharmaceutical company in the Chinese context. Shen suggested that pharmaceutical companies should take on more responsibility compared with other companies (Carroll, 1979). Kong suggested that the CSR for the pharmaceutical industry should prioritize the quality and effectiveness of drugs (Wartick & Cochran, 1985).

To summarize, the study on CSR for pharmaceutical industry indicated that pharmaceutical companies should not only take social responsibility, but also be aware of their unique characteristics. These research findings also suggest that study on developing a specific measurement system for pharmaceutical companies' CSR performance should be a pressing mission.

**The measurement of corporate social responsibility study for pharmaceutical companies.** No specific research about a CSR measurement system for pharmaceutical companies is identified during the process of literature review. However, some scholars' researches provide some bases for further study. For instance, Leisinger suggests that pharmaceutical companies' CSR can be divided into three levels: the responsibilities they must do, the responsibilities they ought to do and the responsibilities they can do (Li, 2010). Li points out that the CSR for pharmaceutical industry should include the responsibilities to the customer, community, and investors and also a philanthropic responsibility (Bowman & Haire, 1975). Besides, since some existing systems developed are also applied to pharmaceutical industry, the indicators they use can be the reference for further research.

## Methodology

### *Panel Composition*

There is no consensus about the best number of experts who should participate in a Delphi study. It generally depends on the number that is needed to achieve representative and valid views about the research questions. The commonly used expert number for Delphi method is ten to fifty. Similarly, the best process for selecting the experts is also not determined. The criteria for inclusion and exclusion are often based on the nature of research questions being discussed.

As discussed above, the concept of CSR has some special and unique meanings for pharmaceutical company. It is therefore essential to involve experts who are specialized in CSR research and who are familiar with Chinese pharmaceutical industry for this study. In addition, CSR measurement system will cover a wide variety of topics, like business strategy, investment, environment protection, consumer rights protection, and law. Therefore, it is also necessary to ensure the diversity of expert background.

In this study, a panel of 26 experts is finally selected in this study. 21 participants come from the academic institutions. Five of them come from the drug administrations. The final panel of experts includes members with professional background in CSR or business ethics (13, 50%), drug regulations (8, 30.77%), pharmaceutical business management (5, 19.23%). All of them have the master or doctoral degree or have senior professional academic positions and all of them have more than ten years' experience in their field.

### ***Survey Instrument***

In order to develop the questionnaire, literature review was first conducted to collect the potential stakeholders and indicators that are relevant to CSR measurement for pharmaceutical industry. The sources of indicator collection include journal papers, international/domestic standards, current CSR indices, and relevant laws and regulations.

As a first step, the eleven stakeholders are identified as shareholder, loaner, customer, environment, supplier, retailer, community, employee, government, public, and competitor. By excluding the indicators with similar meaning and indicators that are not applicable for Chinese CSR research, 351 indicators are collected in reference to relevant publications. Since the research about CSR in pharmaceutical industry is rare, other 26 indicators are added to the indicator pool based on expert consulting. Therefore, an indicator pool with 377 indicators is selected for further filtration. Based on the criteria of comprehensiveness, timeliness, and measurability, the questionnaire with eleven stakeholders and 145 indicators for the first round survey was determined.

In the first round survey, the participants were asked to express their views about the stakeholders and indicators that should include into CSR measurement system. They were also asked to rate the importance of the indicators that they think should be included into CSR measurement system. Ratings were performed on a scale of 1 to 5, with 1 being least important and 5 being most important. Participants were also invited to provide additional indicators they value for CSR measurement for China's pharmaceutical industry. After the first round survey, the questionnaire was revised based on the experts' rating and suggestions, and the new questionnaire was developed for the second round survey. During the second round survey, the participants were only asked to rate the importance of indicators using the same method mentioned above.

### ***Survey Process***

The survey for this study was conducted in two rounds. In the first round, the questionnaire was emailed to 26 experts and 17 valid questionnaires were obtained. Those who participated in the first round were asked to participate in the next round. The questionnaire was also emailed to experts, and 13 of them replied with valid questionnaire.

### ***The Inclusion/Exclusion Criteria***

In the first round, the stakeholders and indicators that 50% percent or more of the experts disagreed with were deleted from the questionnaire. For the importance rating, four criteria were adopted for indicator selection. The first is the proportion of scale 5 and scale 4 an indicator gets. The second is the rank sum, which is the sum of the rating of one indicator from all experts. The third one is a weighted average of rating for an indicator; the weight is the experts' familiarity with this area rating by 1.0(very familiar with), 0.8 (familiar with), 0.6 (neutral), 0.4 (very unfamiliar with) and 0.2 (unfamiliar with). The last criterion is a coefficient of variation (CV), which is calculated by the standard deviation of rating divided by mean of rating. The critical value for the former three criteria is the standard deviation subtract from the mean; the indicators with the value higher than critical value are selected into the system. The critical value for the fourth criterion is mean plus standard deviation; the indicators with the values lower than critical value are put into the system.

## Results

### *The Results of First Round Survey*

In this study, Kendall's Coefficient of Concordance (Kendall's W) was adopted to measure the level of consensus. The Kendall's W for the importance in the first round is 0.217 ( $p=0.000$ ). The degree of authority, measured by the experts' familiarity with the different areas, is 0.761. The critical value of the four criteria is provided in the table 1.

**Table 1. The Critical Value for Selecting Criteria in First Round**

Criteria	Mean	Standard deviation	Critical value
Proportion of scale 5 and 4	0.69	0.12	0.57
Rank sum	68.02	6.63	61.39
Weighted average of rating	4.30	0.34	3.96
Coefficient of variation	0.22	0.06	0.28

Based on these criteria, 33 indicators are excluded in the first round. These indicators include: four indicators for shareholder (rate of return on common stockholders' equity, return on total assets, sales profit ratio, and regularity of the shareholder conference), two indicators for loaner (interest protection multiples and annual frequency of illegal transaction), four indicators for government (profit-tax rate, revenue-tax rate, annual tax, and annual frequency of delay tax payment), four indicators for customer (whether or not providing drug usage assistance, the ratio of clinical trial to total research cost, the ratio of non-clinical trials to total research cost, and whether or not providing real production cost), two indicators for community (employment rate of community resident and whether or not offering internship), one indicator for competitor (whether or not monopolizing), sixteen indicators for employee (hourly wage rate, benefit rate, whether not offering merit pay, whether or not having regulation on salary increment, social benefits payment rate, whether not offer regular physical examination, attrition rate, annual frequency of unreasonable reduction of employees, annual training hours, promotion opportunities, child labor employment, eight-working hour obligation, availability of enough working resources, sound lodging environment offering, and availability of legal holidays).

Based on experts' opinions, some revisions were conducted for several indicators. The indicator for loaner of "frequency of publishing real company information" was replaced by "whether or not publishing real company information" and the indicator of "frequency of illegal activities" was revised as "frequency of other illegal activities".

### *The Results of Second Round Survey*

The Kendall's W in the second round is 0.361 ( $p=0.000$ ), indicating a significant improvement compared to the first round. The degree of authority is 0.842. Critical values for criteria in second round are presented below:

*Table 2. The Critical Value for Selecting Criteria in First Round*

Criteria	Mean	Standard deviation	Critical value
Proportion of scale 5 and 4	0.86	0.13	0.73
Rank sum	57.65	4.25	53.40
Weighted average of rating	4.43	0.33	4.11
coefficient of variation	0.17	0.07	0.24

In the second round survey, sixteen indicators were excluded based on these criteria. These indicators included one indicator for shareholder (market share growth rate), two indicators for loaner (cash to current liabilities ratio and whether or not publishing real company information), one indicator for government (tax growth rate), three indicators for customer (annual frequency of adverse drug reaction, annual number of new drug certification, and the percentage of heavy metal residue in product), four indicators for employees (whether or not the salary level exceeds the local average level, annual frequency of work-related accident, whether or not paying salary during legal holiday, and annual frequency of labor dispute). Five indicators for environment (whether or not forming and implementing environment protection policy, annual rate of environment protection expenditure growth, water consumption per unit revenue, energy consumption per unit revenue, and nonrenewable resource consumption per unit revenue), and one indicator for supplier (annual growth of order).

#### ***The Final CSR Measurement System for Chinese Pharmaceutical Company***

After two rounds of the Delphi survey, a CSR measurement system for Chinese pharmaceutical company is established. This three-level system includes eleven stakeholders and 96 indicators. The indicators for every stakeholder are clustered based on their meanings. The final CSR measurement system is presented below.

*Table 3. CSR Measurement System for Chinese Pharmaceutical Company*

Stakeholder	Responsibility	Indicators
Shareholder	Economical responsibility	Return on total assets ratio
		Dividend payout ratio
		Earnings per share
	Development potential	Growth rate of earnings per share
		Capital maintenance and appreciation rate
		Profit growth rate
	Information disclosure	Timeliness of information disclosure
		Realness of information disclosure
		Comprehensiveness of information disclosure
Loaner	Debt-paying responsibility	Debt ratio
		Current ratio
		Quick ratio
		Interest protection multiples
		Capital turnover rate



	Information disclosure	Whether or not offering information about capital usage	
		Whether or not offering information major financial issues	
	legal responsibility	Frequency of breaching of contracts	
		Frequency of litigation of liability	
		Whether or not having regular external audit	
		Whether or not having regular internal audit	
	Government	Tax payment	Asset-tax ratio
			Percentage of tax payment
Ratio of tax payment in due			
Whether or not having tax evasion			
legal responsibility		Amount of commercial bribe	
		Frequency of commercial bribe	
		Penalty-expenditure ratio	
Social development		social contribute rate	
		Social accumulation rate	
Customer		Drug quality	Whether or not adhering drug standard
	Product qualification ratio		
	Effectiveness of drug		
	Whether or not establishing drug recall system		
	ADR administration	Whether or not establishing ADR surveillance system	
		Whether or not establishing ADR administration system	
		Whether or not providing ADR information	
	Innovation	R&D-revenue ratio	
		R&D employees ratio	
	legal responsibility	Frequency of false advertisement	
		Number of defects of GMP	
		Frequency of other illegal activity	
	Employee	Salary and benefit	Salary growth rate
Salary payment rate			
Whether or not having salary growth policy			
Labor protection		Labor contract signing ratio	

		Social Insurance payment ratio
		Incidence rate of occupational diseases
		Annual frequency of accident
		labor protection input ratio
		Payout ratio of health insurance
	Working environment	Whether or not offering safety facilities
		Whether or not offering health facilities
	Equity and freedom	Whether or not having racial discrimination
		Whether or not having gender discrimination
		Whether or not having religious belief discrimination
		Whether or not having disability discrimination
	Employee right protection	Whether or not having labor union
		Participation rate of labor union
		Whether or not permitting labor union involving in decision making
		Whether or not invading staff's privacy
Career planning	Expenditure on training per capita	
	Expenditure ratio of training to general expenses	
	Whether or not offering assistance for career planning	
Community	Employee promotion	Employment contribution rate
		Employment growth rate
		Whether or not offering job for disadvantaged groups
	Public service	Donation-profit ratio
		Frequency of voluntary service
		Whether or not reclaiming outdated drug
	Community development	Whether or not offering health education
		Whether or not offering environment protection education
	Competitor	Fair competition
The frequency of business bribe		
Whether or not damaging competitor's reputation		

	Legal responsibility	Frequency of litigation of violating intelligence property or brand
		Frequency of litigation of unfair competition
Environment	Environment management	Whether or not passing ISO14000 certification
		Annual frequency of environment population
		Environment protection expenditure-profit ratio
	Pollution emission reduction	Attainment rate of waste water, waste gas and waste residue
		Amount of discharge of waste gas, water and residue per unit profit
	Energy conservation	Recycling rate of water utilization
Industry solid reject synthesis utilization rate		
Renewable resource utilization rate		
Supplier	Economic responsibility	Receivable turnover ratio
		Order completion rate
	Legal responsibility	Frequency of legal dispute with supplier
		Frequency of delay of payment on goods.
Retailer	Economic responsibility	Profitability from retailing
	Legal responsibility	Frequency of legal dispute with retailer
	Operation support	Whether or not providing financial support
		Whether or not providing technical support
Public	Sustainable development	Whether or not having sustainable development policy
		Whether or not having policy for climate change and species diversity
	Public health	Whether or not producing essential medicine
		Whether or not undertaking drug reservation

### Discussion

Pharmaceutical companies play an essential role within society. They are not only responsible to ensure the availability, accessibility and affordability of medicine, but also a pillar industry with high profitability in China. In recent years, Chinese pharmaceutical industry has been confronting with persistent and increasing

criticisms for the poor quality of medicine, for environmental pollution, and for commercial bribe practice in marketing. There exists a strong voice to call for pharmaceutical companies to take CSR initiatives. Due to the great pressure and desire for sustainable development, more and more Chinese pharmaceutical companies have started their CSR actions. Since CSR is a relatively new concept in pharmaceutical industry in China, it is necessary to provide pharmaceutical companies with assistance and guidance for their CSR endeavors. However, there is no comprehensive CSR measuring system available for pharmaceutical companies as their reference.

In this study, a CSR measurement system based on stakeholder theory is developed with adoption of the Delphi method. From this system, we can learn that pharmaceutical companies need to take multiple responsibilities for their key stakeholders, which is much more in line with some other researches about CSR in pharmaceutical industry. Apart from traditional responsibilities, medicine provision for consumer and profit earning for shareholders, pharmaceutical companies are suggested to lay priority on environmental protection, community development, and some other stakeholder concerns that are impacted by their business or that impact their business. Compared with other research findings and existing CSR indices or CSR assessment systems, this system is obviously more complex. As suggested earlier, the goal of developing this CSR measurement system is to provide an overall guideline for China's pharmaceutical companies for their CSR initiatives. Apart from the similarities of different companies, we take into account the specific challenges, trends and especially the challenges the Chinese pharmaceutical industry is confronting with. So the CSR measurement system presented in this paper is particular fit for pharmaceutical companies in China.

The main limitation of this study is that the research did not consider the difference between different sizes, ownerships and maturation levels of companies. As a concept, the CSR is applicable for all companies, but the practice of CSR varies with different companies. Further research should consider different situations the companies confront with. Besides, the number of panel experts is not very ideal since it is hard to find the people who are specialized in CSR and, at the same time, with sound knowledge of pharmaceutical industry. In addition, increase the round of interviews may be helpful to result in more valid research results.

Future research should focus on how to apply this CSR measurement system to stimulate China's pharmaceutical companies to undertake CSR and enhance their development. The application of this system can be discussed from two perspectives. From a micro perspective, it is a tool for individual pharmaceutical companies for their CSR management and CSR strategic planning and implementation. This system will help pharmaceutical companies to identify their key stakeholders, to assess their CSR performance, and to develop CSR report according to the framework based on this system. From a macro perspective, this system can be used to establish CSR principles that can be used as a guideline for activities by the whole industry, industry associations or other relevant institutions. This guideline could serve to achieve consensus from the whole industry and direct the pharmaceutical companies to commit to more socially acceptable practices do the right things. The drug administration agency can also use this system as complementary method to strengthen the industry regulation and administration. This is especially important for countries like China, who has tremendous target objects but limited regulation resources.

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