Social responsibility of engineering and construction enterprises under the “Belt and Road”

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Abstract. In order to enhance the value of large construction engineering enterprises in China and build a good corporate brand image in the “Belt and Road” initiative, China's large-scale construction engineering enterprises must actively fulfill corporate social responsibility and do a good job in brand management. This paper takes listed companies in China's engineering and construction industry from 2006 to 2017 as research samples to empirically test the impact of social responsibility disclosure on the performance of enterprise engineering projects. It is found that the engineering project performance of enterprises with social responsibility report disclosure is critically higher than that of enterprises without social responsibility report disclosure. Under different nature of enterprises, the disclosure of social responsibility report of non-state-owned construction engineering enterprises has a significantly greater impact on project performance than state-owned construction engineering enterprises. Further research also shows that the disclosure of social responsibility report has the most imperative impact on the performance of enterprise engineering projects in the current period. This paper argues that actively promoting engineering enterprises to fulfill their social responsibilities is conducive to promoting the development of large construction and engineering enterprises in the countries along the "Belt and Road" line.

1. Introduction

As the leader of the "Belt and Road" construction, the engineering investment construction of China's enterprises has deepened the cooperation with countries along the route. At present, the total amount of foreign contracted projects of large construction enterprises in China has increased from 10 billion dollars in the early 21st century to 200 billion dollars in 2017. However, the large-scale construction engineering enterprises in China are often left behind due to the poor maintenance of the relationship with the local government, inadequate environmental protection, and the damage to employees' benefit. These social responsibility issues have caused a huge economic loss, but also brought a heavy blow to the image and reputation of China's large construction engineering enterprises. For example, in 2014, the Mexican government announced to revoke the bidding result of China's railway construction project of high-speed railway because of external doubts. In 2015, the Cambodian government announced the suspension of dam projects undertaken by China's hydropower construction group. In 2016, Pakistan's biggest highway construction project was put on hold due to the protests in Pakistan. People in charge of construction projects believe that the disclosure or fulfillment of social responsibility will lead to the increase of enterprise costs and go against the nature of enterprises' pursuit of interests. Therefore, they only regard social responsibility as preaching and are not willing to pay the price. Then the question arises whether the disclosure of social responsibility performance...
can win more people's recognition and improve the performance of enterprise engineering projects, or it will increase the cost of enterprise and reduce the performance of enterprise engineering projects? This paper aims to provide effective countermeasures and suggestions for large construction engineering enterprises to better implement the "Belt and Road" initiative by studying the relationship between corporate social responsibility disclosure and project performance.

2. Literature review and research hypothesis

Although scholars have paid attention to the topic of social responsibility for a long time, they have not given a final conclusion on how it will affect the project performance of companies. Preston and O 'bannon (1997) used reputation index to analyze 67 large companies in the United States, and found that social responsibility and project performance had positive influences on each other no matter who was the independent variable or the dependent variable. At the same time, based on this, they put forward six hypotheses about the relationship between these two variables, which established a theoretical framework for the later scholars' research. Based on the chemical industry, Griffin and Mahon (1997) summarized 51 papers from 1972 to 1997 and finally concluded that there was a positive correlation between social responsibility disclosure and corporate financial performance. Similarly, Shen (2007) selected the data of China petrochemical industry companies from 1999 to 2004 and concluded that the better the company performance is, the more willing they are to disclose the welfare they provide to the employees and the charity they do to the society on the company website. Simpson and Kohers (2002) took American state-owned Banks as research objects and finally came to the conclusion that disclosure of CSR performance would improve project performance. By using KLD index, Ruf et al. (2001) found that disclosing corporate social responsibility reporting in the current period would lead to an increase of profit in the later period. By means of researching relevant studies, domestic scholars have also found that in the short term, the disclosure of social responsibility information will lead to the decline of corporate performance; but in the long term, this kind of effect will disappear (Li, 2006; Wen, 2008). Through the analysis of Internet enterprises, Zhou (2017) concluded that the rise of corporate profits will lead enterprises to actively undertake social obligations, and the degree of its positive impact varies in different stages of enterprise life cycle. However, some scholars put forward the opposite opinion, believing that fulfilling the corporate social responsibility will consume the resources which should be used to enhance the company's profits, so that it will increase the cost and violate the principle of maximizing shareholders' interests (Friedman, 1970; Dou, 2015). In addition, some scholars believe that there is no correlation between the disclosure of social responsibility reports and the corporate performance no matter in the long or short term (Aupperle et al., 1985; McWilliams and Siegel, 2000).

Based on the above viewpoints, most scholars still believe that there is a positive correlation between social responsibility and corporate performance. Only by serving and making contributions to the society actively can enterprises improve their social status, gain support from the society and obtain advantages in the future development (Zhou, 2005). Therefore, we propose the following assumption:

H: Disclosure of CSR report is helpful to improve corporate engineering performance.

3. Research design

3.1. Sample selection

This paper selects the data of 2006-2017 listed companies in China's engineering and construction industry as a sample. The reason for choosing this period is that the disclosure of social responsibility of listed companies in China has begun to receive widespread attention during this period, and it presents a trend of intensive and routine disclosure, by the way, 2017 is the latest annual data available in this article. In addition, in order to maintain the comparability of data and eliminate the influence of outliers, this paper also makes the following treatment to the variables: (1) delete incomplete corporate
social responsibility disclosure and financial data; (2) conduct 1% tail reduction for all continuous variables. The data in this paper are all from CSMAR database and iFinD database.

3.2. Variable selection

3.2.1. Social responsibility disclosure
In order to avoid the subjectivity and one-sidedness that individuals may have in evaluating corporate social responsibility reports, different from CSR accounting method, reputation method, content analysis method and KLD index method used by other scholars, this paper selects the indicator "whether to disclose the social responsibility system construction and the improvement measures" (CSR) in CSMAR database to reflect the status of corporate social responsibility disclosure (disclosure takes 1; otherwise takes 2).

3.2.2. Engineering performance
Generally, there are two kinds of indexes used to measure engineering performance: one is the market income index and the other is the accounting index (Liu, 2010). Market income indicators mainly reflect the stock market's income or the changes of stock price, focusing on the return to shareholders, such as Tobin's Q. Accounting indicators are used to reflect the company's status, such as ROA, etc. Considering that China's stock market is not well developed, and the financial statements are more reliable and easy to obtain, we choose accounting indicators to reflect the company's situation. Through the study of relevant literature from 2001 to 2010 in ISI database, we found that about 65% of scholars chose the return on total assets to reflect the status of enterprises. Based on this, this paper decided to use the return on assets (ROA) to reflect the situation of the enterprise.

3.2.3. Control variables
Referring to the practices of previous scholars, this paper controls the influence of enterprise scale (\( \ln \text{Asset} \)) which is logarithm of total assets; enterprise growth (Revenue) which is the revenue growth rate and financial leverage (ALR) which means asset-liability ratio when studying engineering performance in the empirical model. In addition, the paper also uses the annual dummy variable to control the differences of engineering performance in different years.

3.3. Model construction
Based on the selected research variables, this paper constructs a multivariate regression model with random effects to study the relationship between social responsibility disclosure and corporate financial performance, where \( \alpha_0 \) is a constant term, \( \alpha_2 \) to \( \alpha_4 \) are regression coefficients, and \( \varepsilon \) is a random disturbance term.

\[
\text{ROA}_{p,t} = \alpha_0 + \alpha_1 \text{CSR}_{p,t} + \alpha_2 \ln \text{Asset}_{p,t} + \alpha_3 \text{Revenue}_{p,t} + \alpha_4 \text{ALR}_{p,t} + \varepsilon_{p,t}
\]

4. Empirical analysis

4.1. Descriptive statistics
This paper conducts descriptive statistical analysis for all variables in the whole sample, and the results are shown in table 1.

| VARIABLES | N  | MEAN | Min  | p25 | p50 | p75 | Max   | SD   |
|-----------|----|------|------|-----|-----|-----|-------|------|
| ROA       | 1356 | 0.0452 | -0.691 | 0.0145 | 0.0357 | 0.0675 | 7.445 | 0.116 |
| CSR       | 1356 | 1.752 | 1     | 2   | 2   | 2   | 2     | 0.432 |
| LNASSET   | 1356 | 23.15 | 18.27 | 21.94 | 22.89 | 24.06 | 30.81 | 1.756 |
| REVENUE   | 1356 | 0.497 | -1.000 | -0.0264 | 0.106 | 0.266 | 349.5 | 7.681 |
| ALR       | 1356 | 0.509 | 0.00797 | 0.350 | 0.517 | 0.669 | 2.401 | 0.217 |
Table 1 lists the descriptive statistical results of all variables before truncation. In general, the status of social responsibility disclosure for the sample companies is hardly satisfactory. The average value of social responsibility disclosure index is 1.752, and the values are all 2 in the 25th, 50th and 75th percents, indicating that most enterprises do not disclose relevant information about their social responsibility performance. In terms of return on assets, the minimum value of sample companies is -0.691, the maximum value is 7.445, and the average value is 0.0452. This indicates that the profitability of listed companies varies greatly, and the overall profitability is low.

4.2. Correlation analysis

Table 2. Correlation analysis.

|       | ROA  | CSR  | LNASSET | REVENUE | ALR  |
|-------|------|------|---------|---------|------|
| ROA   | 1    | -0.036*** | 1       |         |      |
| CSR   | -0.036*** | 1    | 0.134*** | 1       |      |
| LNASSET | -0.095*** | 0.134*** | 1    |         |      |
| REVENUE | 0.00500 | -0.0170 | 0.0140 | 1    |      |
| ALR   | -0.203*** | 0.058*** | 0.590*** | 0.039*** | 1   |

*** p<0.01, ** p<0.05, * p<0.10, + p<0.15

Table 2 shows the results of Pearson correlation coefficient analysis among all variables. It can be concluded from the table that social responsibility disclosure is significantly correlated with corporate engineering performance at the level of 1%, and the symbol is in line with expectations. At the same time, engineering performance is also strongly correlated with enterprise scale and financial leverage. The above results preliminarily indicate that social responsibility disclosure will affect the engineering performance of the company.

4.3. Empirical results

This paper uses Stata software to perform multiple regression analysis on relevant variables reflecting corporate social responsibility disclosure and engineering performance, so as to verify the hypothesis proposed above. At the same time, due to the particularity of China's economic system, the nature of enterprises has a great impact on the company's social responsibility. Therefore, on the basis of full sample regression, this paper also conducts subsample regression of state-owned enterprises and non-state-owned enterprises to ensure the integrity of the study.

Table 3. Empirical results.

| VARIABLES | ROA full sample | ROA state-owned enterprise | ROA non-state-owned enterprise |
|-----------|-----------------|---------------------------|-------------------------------|
| CSR       | -0.008***       | -0.010*                  | -0.006***                    |
|           | (-2.22)         | (-1.68)                  | (-2.15)                      |
| LNASSET   | 0.003***        | 0.003**                  | 0.004***                     |
|           | (2.69)          | (2.14)                   | (4.27)                       |
| REVENUE   | 0.000           | 0.000                    | 0.000                        |
|           | (0.97)          | (0.58)                   | (1.01)                       |
| ALR       | -0.122***       | -0.132***                | -0.107***                    |
|           | (-13.56)        | (-9.46)                  | (-15.07)                     |
| Constant  | 0.051**         | 0.045                    | 0.013                        |
|           | (2.16)          | (1.29)                   | (0.59)                       |
| Observations | 1356            | 1356                     | 1356                         |
| Adjusted R-squared | 0.256            | 0.259                    | 0.204                        |
| F         | 57.63           | 25.97                    | 66.93                        |

*** p<0.01, ** p<0.05, * p<0.10, + p<0.15
From the regression results, the paper finds that the disclosure of social responsibility and the engineering performance of the company are significantly negatively correlated at a level of 5%, which suggests that compared with a company with undisclosed social responsibility information, the company which disclose the social responsibility report will gain a higher return on assets. So that we can verify the hypothesis above, that the disclosure of corporate social responsibility report helps improve the enterprise's engineering performance. According to the results of subordinate sample regression, both state-owned enterprises and non-state-owned enterprises' disclosure of social responsibility report will improve the return on assets of enterprises, but in non-state-owned enterprises, this kind of effect will be more significant.

4.4. Additional analyses
In practical social activities, the impact of corporate social responsibility on engineering performance may not be achieved overnight, but through a gradual process with a certain lag (Zhang, 2013). This is mainly because the market in reality is not perfect and there are many irrational factors interfering with it, which makes it difficult for stakeholders to timely and comprehensively grasp the information about enterprises' social responsibility. Therefore, this paper adopts the data of enterprise engineering performance with lag of one period, two periods and three periods to carry out the expansion test.

| VARIABLES | dependent variable: ROA |
|-----------|-------------------------|
|           | t | t+1 | t+2 | t+3 |
| CSR       | -0.008** | -0.001 | -0.000 | 0.008 |
|           | (-2.22) | (-0.39) | (-0.25) | (1.25) |
| LNASSET   | 0.003*** | 0.003*** | 0.002*** | -0.000 |
|           | (2.69) | (5.76) | (3.63) | (-0.16) |
| REVENUE   | 0.000 | 0.000+ | 0.000 | 0.000 |
|           | (0.97) | (1.47) | (1.17) | (0.32) |
| ALR       | -0.122*** | -0.101*** | -0.091*** | -0.063*** |
|           | (-13.56) | (-25.51) | (-20.68) | (-3.88) |
| Constant  | 0.051** | 0.027** | 0.039*** | 0.065+ |
|           | (2.16) | (2.57) | (3.41) | (1.52) |
| Observations | 1356 | 1243 | 1130 | 1017 |
| Adjusted R-squared | 0.256 | 0.151 | 0.131 | 0.114 |
| F | 57.63 | 192.6 | 132.5 | 90.59 |

*** p<0.01, ** p<0.05, * p<0.10, + p<0.15

The regression results show that companies disclose the information of social responsibility has the most significant impact on engineering performance in the current period, and this effect becomes weaker and weaker over time. The disclosure of social responsibility report has an impact on the lag of the first period and the second period, but it is not significant, even when it comes to the lag of the third period, it appears an opposite effect. This also reflects the phenomenon that China’s market mechanism is constantly improving.

5. Conclusion
This paper takes the data of China’s a-share listed companies in engineering and construction industry from 2006 to 2017 as a sample to empirically test the impact of social responsibility disclosure on corporate engineering performance. The main research findings are as follows: first of all, in general, the disclosure of social responsibility information helps improve the engineering performance of enterprises. Secondly, under different characteristics of enterprises, the disclosure of social responsibility reports by state-owned enterprises and non-state-owned enterprises can both improve the engineering performance of enterprises, but this kind of effect is more significant under the nature
of non-state-owned enterprises. Finally, the study also finds that corporate social responsibility disclosure has the most significant impact on the current engineering performance. These research conclusions have certain enlightenment significance for us to deeply understand the role between corporate social responsibility and engineering performance, and it is helpful for enterprises to improve their awareness of social responsibility and consciously fulfill social responsibility.

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