

ENVIRONMENTAL REGULATION, CORPORATE BEHAVIOR AND CORPORATE PERFORMANCE ---- EVIDENCE FROM CHINA OIL AND GAS COMPANY

Fan Ye, China University of Petroleum (Beijing), (+86)15101186516, fanyecup@foxmail.com

Zhang Zhicheng, University of Michigan, +1(734)9267268, zhicheng@umich.edu

Zhao Xiaoli, China University of Petroleum (Beijing), (+86)13910778294, email99zxl@vip.sina.com

Overview

Many firms in developed countries have decided that it is profitable to integrate sustainability into their business strategy (Nidumolu et al., 2009). However, the business benefits of proactive sustainability strategy are less clear in emerging and transitional economies, where environmental and social regulations are either lacking or poorly enforced, and where the demand for the greener environment does not exist (Earnhart et al., 2013).

In recent years, along with accelerated industrialization, China's energy consumption has increased dramatically, which resulted in serious environmental problems. Environmental incidents have caused serious impacts on the residential and the ecological environment. The conception of sustainable development and environmental protection is increasingly ingrained. Environmental regulation is one of the main administrative measures in directing corporate behavior and guiding enterprises through environmental protection. In view of the significant impacts from environmental regulations, those regulated enterprises may adjust their behavior accordingly. Different adjustment of corporate behaviors will lead to diverse corporate performance eventually. The results of "Environmental Regulation – Corporate Behaviours – Corporate performance" can be reflected from surveys among top managers in Chinese oil and gas companies by using structural equation models (SEM) approach. Specifically, we 1) employ the SEM methodology to examine the path effects between "Environmental Regulation – Corporate Behaviours – Corporate performance"; 2) examine the different effects from administrative-based environmental regulation (AER) and market-oriented environmental regulation (MER) to corporate performance; 3) use balanced scorecard (Kaplan & Norton, 1995) to extend the concept of corporate performance into four perspectives (financial perspective, customer perspective, internal business process, and innovation and learning); 4) AER and MER also have different impacts on firm-specific behaviors such as strategy choice, technical progress and production decisions and environmental management.

Methods

Methods in this paper contain measures, survey and data collection, and SEM approach. The role of each section in this article is obvious and was introduced as follow:

- 1) Measures. Since the variables used in this study (AER, MER, the three types of firm behavior, and corporate performance) are hard to observe directly (i.e., they are latent variables), they are captured by measurable indexes (also called observable variables or items), we properly designed the measurable indexes through theory, literature reference, and expert interviews.
- 2) Survey and data collection. Data for this study is collected from a survey of oil and gas firms in China. The survey gathers information about the perception of AER and MER pressures, as well as the relative influence of AER and MER on firm behavior and performance. We interviewed several experts and leaders in related firms who are familiar with environmental management to pretest our questionnaire and ensure that the observable variables used to capture the latent variables of AER, MER, firm behavior, and corporate performance are suitable and sufficient. The survey was conducted through on-the-spot surveys and email. All the 1088 questionnaires were distributed to oil and gas companies and were scattered to regions as much as possible. In the end, 822 samples were returned and 636 were valid. Then data collected through surveys were used in the following research.
- 3) SEM approach. Structural equation modeling (SEM) is used to estimate the impact of environmental regulation on firm behavior and performance. SEM is an apriori statistical technique involving multiple regression analysis, path analysis, and confirmatory analysis (Jokisaari et al., 2009). SEM consists of structural equations and measurement equations. Measurement equations address the relationship between latent variables and observable variables with confirmatory factor analysis. Structural equations map the relationship among latent variables, showing the qualitative relationship between exogenous variables and endogenous variables in multiple regression analysis (Powell et al., 2008).

Results

The results indicate that (1) in term of oil and gas companies in China, AER has positive impact on company performance (influence coefficient is 0.450 and significant at 1%), MER has negative effect at -0.242 and significant at 1% level; (2) both AER and MER positively influence firm green strategy (influence coefficient are 0.200, 0.282 and significant at 1%); (3) AER has positive impact on firm technology & production process while MER has no influence; (4) AER affect firm environmental management in a positive way while MER is on the contrary; (5) corporate technology and production process influence corporate performance in a negative way (-0.233) and direct firm environmental management leads to positive impact on the performance; (6) robustness test contains Mediation Model Fit Analyses, Effect Decomposition and also impact of SOEs (state-owned enterprises) and direct effect from AER and MER to Financial Perspective, all the stability test enhanced the results found above.

Conclusions

Concerns about the environment strike throughout China's oil and gas industry. This study analyzed how environmental policies (AER & MER) affect firm behaviors and thus affect corporate performance. The corporate performance was extended according to Balanced Scorecard which showed a comprehensive aspect of company performance. Based on the survey data of 636 managers in Chinese oil and gas companies and the method of structural equation models (SEM) approach, the effect of environmental regulations on corporate performance was then empirically analyzed. This study also improved analytical robustness by separately assessing Mediation Model Fit Analyses, Effect Decomposition, SOEs impact and direct impact from AER and MER to Financial Perspective.

The positive impact of the AER reflects Chinese government influenced the market by creating environmental regulations which balanced environmental protection and corporate long-term development. However, MER influences the companies negatively which means a rational design of environmental regulation is still necessary and also essential notice should be taken on free riding between SEOs and other companies. In addition, the negative path of "green strategy – technology & production process – Corporate", "environmental management – corporate performance" need more attention on them, since sustainability means balance cost of both nature and company. In view of that, environmental regulations impose great challenges and uncertainty on Chinese oil and gas enterprises, which leads to different outcomes. The government should not only formulate and implement strict environmental laws and regulations but also balance the company's performance with their environmental threats in future policymaking, which will surely lead to sustainable development.

References

- Earnhart D H, Khanna M, Lyon T P. Corporate Environmental Strategies in Emerging Economies[J]. Review of Environmental Economics & Policy, 2014, 8(2):164-185.
- Jokisaari M, Nurmi JE. Change in newcomers' supervisor support and socialization outcomes after organizational entry. Academy of Management Journal. 2009, 52(3):527-44.
- Kaplan RS, Norton DP. Putting the Balanced Scorecard. Performance measurement, management, and appraisal sourcebook. 1995:66.
- Nidumolu R, Prahalad C K, Rangaswami M R. Why sustainability is now the key driver of innovation[J]. IEEE Engineering Management Review, 2013, 41(2):30-37.
- Powell GN, Greenhaus JH. Sex, gender, and the work-to-family interface: Exploring negative and positive interdependencies. Academy of Management Journal. 2010, 53(3):513-34.