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The Impact of the Number of Regulated Suppliers in Green Supply Chain Action on Financial Performance

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Abstract. In recent years, with the gradual attention to environmental pollution and the deep understanding of sustainability theory, the supply chain of the real estate industry has begun to change to a green and sustainable development approach. In 2016, Society of Entrepreneurs and Ecology and other real estate industry alliance organizations, together with Vanke and other industry leaders, launched the “Green Supply Chain Action” to establish a green procurement whitelist by testing the environmental performance of building materials suppliers in various categories. This paper focuses on the impact of the number of suppliers regulated by the company on the financial performance of the company in the sustainable supply chain. The empirical results show that the number of suppliers under corporate supervision is negatively related to financial performance. In response to the findings, this paper puts forward development suggestions for real estate green supply chain management.

Keywords: Sustainable Supply Chain Management, Green Supply Chain Action, Supplier Management, Financial Performance.

1 Research Background and Problem Formulation

In recent years, the positive development of economy in China has attracted world attention, but at the same time more and more environmental pollution problems have been exposed by the media, and it is imperative to deepen the supply-side reform and promote the green development of the whole industry. The real estate industry has always been one of the highly polluting enterprises in China. In the past, real estate enterprises mainly made profits with the real estate development model and took profit maximization as their primary goal, ignoring the management control of environmental pollution. In the whole life cycle of real estate, the enterprises involved in each link are fragmented, the development of standards in the industry still needs to be improved, and the real estate supply chain urgently needs to be regulated and managed^[1]. In recent years, with the gradual attention to the problem of environmental pollution and the deep understanding of the theory of sustainable development, the supply chain of the real estate industry has begun to embark on the transformation to a green and sustainable development approach^[2].

In 2016, Society of Entrepreneurs and Ecology (hereinafter referred to as the SEE) joined hands with industry alliances such as Zhongcheng United Investment, as well as industry leaders such as Vanke and Landsea, to jointly launch the “Green Supply Chain Action In The Real Estate Industry”(hereinafter referred to as the GSC). Unlike the previous sustainable transformation of a single enterprise, GSC is the first attempt to implement a green supply chain in the whole real estate industry in the form of an industry coalition. The GSC Working Group established a partnership with a third-party testing organization to establish a green procurement whitelist by testing the environmental performance of building materials suppliers in various categories. Until now, the number of product categories included in the testing has gradually increased, and the number of supplier companies that have been tested and added to the whitelist has also increased.

Therefore, based on study of environmental management in supply chains, this paper will focus on industry federated supply chain regulation, using real estate companies that have joined the GSC action as the subject of the study, to investigate the impact of the number of suppliers subject to corporate regulation in sustainable supply chains on corporate financial performance. The findings of this study will provide recommendations for the future development of environmental regulation in the supply chain of the real estate industry.

2 Theoretical Analysis and Research Hypothesis

On the one hand, according to the performance evaluation theory that considers the environment, assessing suppliers' environmental performance and implementing green procurement can help motivate suppliers to improve their production processes, reach environmental cooperation between upstream and downstream enterprises, and improve the environmental performance of green supply chains. At the same time, the study shows that the supervision of suppliers by enterprises has a positive impact on both environmental and social performance of suppliers, and cooperation with suppliers has a positive impact on suppliers' environmental performance. Suppliers' performance improvement on environmental and social responsibility has a positive impact on corporate performance^[3]. At the same time, supplier and customer relational capital improve financial performance indirectly through supplier and customer green management^[4]. Therefore, the expansion of regulated supplier is likely to have a positive impact on corporate financial performance.

On the other hand, drawing on Porter's hypothesis, suppliers are likely to innovate technologically or even undergo a general renewal of product production processes or industrial transformation when they are under pressure from environmental regulation^[5]. It can be inferred that suppliers will increase their financial performance by using new technologies to shrink production costs or increasing the selling price of products, the latter of which will lead to an increase in procurement costs for real estate firms. Joining the GSC requires real estate firms to supervising suppliers to complete relevant testing steps and oversee their rectification, and the increase in the number of supervised suppliers is likely to lead to an increase in corporate manage-

ment costs. In recent years, the internal competition in the real estate industry has intensified and the external government regulation and supervision has become stricter. The level of return on investment of real estate enterprises has decreased and the profit level has fallen, so the cost in supervising suppliers may have a negative impact on the profitability of enterprises instead.

Therefore, based on the above theoretical studies and inferences, increasing the number of regulated supplier firms may have two different effects on firms' financial performance, and the following two hypotheses are proposed.

Ha: The number of regulated suppliers is positively associated with corporate financial performance.

Hb: The number of regulated suppliers is negatively associated with corporate financial performance.

3 Empirical Analysis

3.1 Sample Selection and Data Sources

This paper examines the impact of the growth in the number of regulated suppliers on the financial performance of the companies, using all listed companies in the first 48 companies that joined the GSC as a sample. According to the screening, there were five listed companies that joined the GSC at the beginning of the action, and none of them have been ST from 2016 to date, and their financial data are sourced from Juchao Information Network and each company's public annual report.

The source of supplier whitelist data is the official website of GSC (<http://www.cura.cn/>) and the official WeChat official account. According to statistics, the number of supplier companies in the whitelist updated every year are 159, 575, 3491 and 3841.

3.2 Model Setting

Referring to the studies of Zhou, Li and Hua^[6,7], the model is set as follows.

$$NPG_{it} = \beta_0 + \beta_i CGR_t + \sum \lambda_i Control_{it} + \varepsilon_{it} \quad (1)$$

i takes values from 1 to 5 and refers to the five listed companies that are the subject of the study. t is the number of years since joining the GSC action. β is the slope of the regression line, indicating the correlation between NPG and CGR, and λ indicates the correlation between the dependent variable and the control variable.

The detailed definition of each variable is shown in Table 1.

Table 1. Main variables and definitions.

Variable type	Variable name	Variable symbols	Variable description
Main Variables	Net profit growth rate	NPG	Total net income for the current period/ Total net income for the previous period

Control variables	Growth rate of regulated suppliers	CGR	Number of regulated suppliers in year t/Number of regulated suppliers in the first year
	Ratio of liabilities	lev	Average total liabilities/ Average total assets
	Current ratio	CR	Total current assets/ Total current liabilities
	Total assets turno- ver ratio	TAT	Sales revenue/ Average total assets

3.3 Regression Results

Regression analysis of the data according to the above model yields the following results.

$$\{\beta_i\} = \{0.395, -1.98, -5.538, -32.827, 0.046\}$$

The regression results of the data related to Vanke Group and Suzhou Golden Mantis Construction & Decoration Co., Ltd. are positively correlated and the independent variable has little effect on the dependent variable, while the results of the remaining three listed companies are negatively correlated. Therefore, it can be tentatively concluded that hypothesis H_b holds that the number of regulated suppliers is negatively correlated with corporate financial performance. The more upstream supplier companies in the industry are evaluated and supervised by real estate firms, the greater the negative impact on profitability is.

3.4 Conclusion Analysis

In recent years, with the government's proposition of "stabilizing expectations, housing prices, and land prices", real estate policies have been strengthened and financial regulation has become stricter, and real estate companies have encountered more difficulties in their development. Especially after 2018, real estate companies have scaled down their core businesses to maintain a good cash flow position. Vanke, Landsea, Longhu and other core firms of the GSC have actively transformed to carry out diversified businesses^[8]. While the leading companies in the industry have entered the transition period, the companies joining the GSC still need to maintain continuous monitoring of suppliers and increase the number of tested product categories and suppliers year by year. The increase of costs and expenses in the property business has a negative impact on the economic performance of the companies.

4 Development Suggestions

4.1 Establishment of Intelligent Data System for Real Estate Industry

In the background of cloud computing, Internet of Things, big data and other information technologies are widely used, in order to control the management costs con-

sumed by the assessment and supervision, the GSC action intelligent data system can be established. Enterprises supervise upstream suppliers to report environmental indicators and financial indicators such as product prices truthfully into the system and update them regularly. Real estate companies will use the system to intelligently work out the upstream suppliers with the greatest performance gains in all aspects, thus optimizing green procurement solutions and saving procurement costs.

4.2 Comprehensive Performance Appraisal

The sustainability of an organization does not only lie in one aspect of economic performance, but should be considered from three dimensions of economic, environmental and social performance. According to relevant studies, enterprises can more effectively improve their environmental performance by proactively implementing green supply chain management practices^[5]. Therefore, the environmental performance assessment index of real estate green supply chain can be comprehensively established based on the industry characteristics of the real estate industry and the main pollutant measurement index, using performance assessment methods such as lifecycle assessment (LCA), multi-attribute utility and balanced scorecard^[9]. Based on this index, the impact of upstream supplier monitoring on the economic and environmental performance of enterprises is analyzed comprehensively to further clarify the future development direction of enterprises involved in GSC action.

5 Conclusion and Outlook

This paper examines the impact of the number of regulated suppliers on the economic performance of companies, using the example of already listed companies participating in the GSC action. The result shows that the number of upstream suppliers in the industry supervised by the firm has a negative impact on economic performance. Through the analysis, the author believes that this is due to the increasing cost of supervising suppliers in the context of government policies regulating the real estate industry.

At present, GSC action is in a positive development stage, and its influence in the industry is increasing year by year, while it has effectively made outstanding contributions to the real estate industry in reducing pollution emissions. As the first industry organization to jointly implement green supply chain, the impact it will bring to the development of enterprises, industry and society after its long-term development still needs further observation and research. The real estate industry continues to play an economic pillar role in China, and only if the real estate supply chain practices sustainable production and actively optimizes economic and environmental performance can it achieve greater development space and make the real estate industry develop in a more healthy and reasonable direction.

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