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The Research on the Impact of Customers on the Firms' Green Behaviors

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Abstract

With the deterioration of the natural environment, how to promote the firms' green behaviors has become an important topic. The study examined the impact of customers on the firms' green behaviors. Then, we conducted empirical tests on the Chinese-listed companies. It has been found that green customers positively promote the firms' green behaviors. Meanwhile, the assets liability ratio and the polluted industry strengthen the impact of customers on the firms' green behaviors. This study makes suggestions that the government can drive the green development of the overall supply chain by providing support to customer-side firms.

Keywords: customers; assets liability ratio; green behaviors; polluted industry

1. Introduction

With the deterioration of the natural environment, the firms' green behaviors attract more and more attention from the public. how to promote the firms' green behaviors and reduce the pollution of the natural environment has become an important topic. The daily operations of the firms are closely related to their stakeholders, so their green behaviors are inevitably influenced by the stakeholders. Especially, with the development of the concept of a green supply chain, enterprises are facing higher green requirements for their products and services from customers than before. Therefore, the impact of customers on the firms' green behaviors has attracted the attention of researchers.

This study analyzes the Chinese-listed companies and examines the impact of customers on the firms' green behaviors. It has been found that green customers positively promote the firms' green behaviors. The assets liability ratio and polluted industry strengthen the impact of customers on the firms' green behaviors. The study reveals how enterprises carry out green activities under the influence of customers, examines how the enterprises can fully utilize

customers' resources to promote green activities and provides empirical evidence. It also makes suggestions for the government to formulate policies that offer support for customer-side firms to drive the green development of the overall supply chain.

2. Literature Review

Previous research has mainly analyzed the determinants of the firms' green behaviors from the perspectives of corporate strategy, resource-based view, institutional theory, and stakeholder theory. Su and Tsang (2015) proposed that the diversification strategy promotes the firms' green behaviors based on the perspective of the corporate strategy. The reason is that the companies can establish legitimacy in the market, acquire market knowledge, and build reputation through green behaviors. Marcus and Anderson (2006) examined the relationship between the firms' dynamic capabilities and their green behaviors based on a resource-based view. They found empirical evidence that the firms' dynamic capabilities can improve the firms' technological level, thereby promoting the green activities of the firms. Greenstone (2003) analyzed the impact of the Clean Air Act in the United States on steel companies from the institutional perspective and found that the law had a positive influence on the green activities of the enterprises. The scholars who hold stakeholder theory argue that the daily operations of the enterprises are closely related to their stakeholders, and therefore their green behaviors are inevitably influenced by the stakeholders. For example, Huang and Chang (2019) found that foreign investors who have a relatively high level of low-carbon technology can help companies reduce the cost of implementing green behaviors. Lin et al. (2014) found that the suppliers' compliance is closely related to the green innovation of the enterprises. Customers, especially, as one of the important stakeholders of the enterprise, directly determines the survival and development of the enterprise, which has attracted high attention from researchers.

Zhang (2012) pointed out that environmental responsibility is allocated between customers and suppliers in the supply chain, and suppliers carry out green activities within this allocation framework. Huang and Chen (2015) found that in the Chinese market, foreign customers promote Chinese enterprises to reduce their pollution through supply chain pressure. Nair et al. (2016) conducted a case study on two Korean companies, Hyundai Motor and Samsung Electronics, proposing that companies which actively fulfill environmental responsibilities could drive suppliers to take environmental responsibilities and implement green behaviors through transmission mechanisms. Cao and Chen (2017) argued that the customer's demand for green products constructed the market pressure for suppliers. The greater the customer's demand for green products, the greater the pressure the suppliers feel. And the suppliers respond more actively by implementing green behaviors. Melander (2018) argued that firms collaborated with customers to innovate green products from the perspective of knowledge management. Fontoura and Coelho (2022) found that customer pressure is related to the firm's green performance. Di Pasquale et al. (2023) investigated how customers can allocate green orders between their suppliers effectively. Although previous research has explored the impact of customers on the firms' green behaviors, this mechanism still needs to be analyzed in more detail, especially how the boundary conditions play a role needs to be further expanded.

This study examined the impact of customers on the firms' green behaviors, to answer the

research question of "How do customers affect the firms' green behaviors? ". Afterward, the study proposed hypotheses based on the mechanism and conducted empirical research.

3. The Impact of Customers on the Firms' Green Behaviors

3.1 The Relationship between Customers and the Firms' Green Behaviors

The customers influence the firms' green behaviors through the following mechanisms. Firstly, the firms' green behaviors are an overall process that includes green procurement, green production, green sales, and so on. To implement green behaviors and maintain high environmental performance, customers often propose high-level environmental standards for firms' products, production technology, and so on. Especially with the highly developed global supply chain, environmental scandals from firms also affect their customers. The firms need to actively carry out green activities and respond to customers' high environmental standards. Secondly, the more actively the customer implements green behaviors, it means that the customer has more knowledge, technology, experience, and management skills which is related to environmental protection. The customer can transfer relevant knowledge, technology and so on to the firm, helping the firm carry out green activities smoothly. Thirdly, customers who actively implement green behaviors often build close relationships with the environmental parties including non-profit organizations and professional institutions who are rich in environmental knowledge. The customers can introduce the firms to the environmental network, which is helpful for the firms to obtain the necessary resources. Therefore, the customers have a positive impact on the firms' green behaviors. Based on this, the study proposes the following hypothesis:

H1: The green customers positively promote the firms' green behaviors.

3.2 The Moderating Effect of the Assets Liability Ratio

The assets liability ratio is the ratio of a company's total liabilities to its total assets. Enterprises with high assets liability ratios face large pressure from their large proportion of liabilities. They are monitored by the creditor and need to respond to the creditor's expectations. With the increasing expectations of the public for the green image of the enterprises, creditors have also put the firms' green performance into consideration of supervision. Even some banks and other creditors view the firms' green performance as one of the indicators of risks. Once the firm experiences a vicious environmental incident, it is likely that its stakeholders feedback to the firm negatively. Especially, customers who value the green image may believe that the firm does not have sufficient ability to ensure its green supply, and this may affect the public image of the customer. In this situation, the firm will face the risk that the customers may cancel or reduce orders. The firm's debt repayment ability will also decrease. It means that firms with high assets liability ratios face more attention and supervision from creditors on their green behaviors. The firms with high assets liability ratios are more affected by the customers than the ones with low assets liability ratios. Based on this, the study proposes the following hypothesis:

H2: The assets liability ratio strengthens the impact of customers on the firms' green behaviors. That is, the firms with high assets liability ratios are more affected by customers

than the ones with low assets liability ratios, and take more actively green behaviors.

3.3 The Moderating Effect of Polluted Industry

The enterprises in highly polluted industries are paid a lot of attention from stakeholders such as customers. The firms in polluted industries may have bottlenecks and weaknesses during the customers' green supply chain management. Customers who actively adopt green behaviors often prioritize suppliers from highly polluted industries in the management issues, and try to give such suppliers more monitoring and support by various channels. Firstly, compared to low-polluted industries, the customers who value green image are stricter in the selection of the products from firms of high-polluted industries. Secondly, the customers who actively adopt green behaviors often have rich knowledge, technology, and management experience in green management. Customers transfer their knowledge and experience about green management to firms in highly polluted industries, which enhances the firms' willingness to promote green behaviors. Thirdly, the customers with green management own rich relationships. The customers are strongly motivated to introduce the firms in highly polluted industries into the network of the green supply chain, to reduce environmental risks that come from the firms. Therefore, compared to low-polluted industries, firms in highly polluted industries are more affected by green customers. Based on this, the study proposes the following hypothesis:

H3: Polluted industries strengthen the impact of customers on the firms' green behaviors. That is, the impact of customers on the firms' green behavior is stronger in highly polluted industries than in low-polluted industries.

4. Research Design

4.1 Samples and Data

Our sample consists of data from Chinese-listed companies from 2011 to 2019. The databases include the Hexun database of corporate social responsibility about Chinese-listed companies, CSMAR (China Stock Market & Accounting Research Database), and the Supply Chain Research Database of Chinese Companies (SCRD). The data about the green behaviors of customers and the firms comes from the Hexun database of corporate social responsibility about Chinese-listed companies. CSMAR contains basic information and financial information about the enterprises. We can determine the relationship between suppliers and customers through SCRD. SCRD records information on customers of Chinese-listed companies. After removing the missing values, the final sample included data from 644 firm-years (348 firms).

4.2 Dependent Variable

The firms' green behaviors: This study uses the rating of the green behaviors in the Hexun database to measure the firms' green behaviors. The firms' green behaviors include green purchases, green production, green logistics, environmentally friendly products, research and development to improve the production line and product, the investment of the equipment and technology to purify the pollutants at the end of the production, and so on. Therefore, we

use the rating which can evaluate the whole green behaviors in the firm. Besides, we make sure that independent and control variables lagged one year after the dependent variable, to avoid the problem of reverse causality.

4.3 Independent Variable

Green customers: This study makes use of the rating of the green behaviors in the Hexun database to measure green customers. Firstly, based on the data of customers recorded in SCRD, we defined the list of customers that matches the firms. Then, the average score of the customers' green behaviors is used to measure the level of green customers.

4.4 Moderating Variables

Assets liability ratio: The formula of total liabilities/total assets is used to calculate the assets liability ratio.

Polluted industries: Polluted industries mainly include the mining industry, textile, clothing, leather and fur industry, metal and non-metallic industry, petrochemical and plastic industry, food and beverage industry, water and gas industry, biomedical industry, and paper and printing industry in China. When the enterprise belongs to a polluted industry, we take the value as "1", otherwise ' 0 '.

4.5 Control Variables

The control variables of the paper include firm size, firm age, return on assets (ROA), research intensity, ownership of top ten shareholders, as well as industry and year dummies. We used total assets to measure the firm size. To reduce the potential problem from extreme value, we take the log transformation about firm size. Firm age was calculated as the years that the firm had been established. ROA is measured as return scaled by total assets. Besides, the research intensity was measured as research expense scaled by total sales. The ownership of the top ten shareholders was the sum of ownership which the top ten shareholders control.

5. Result

Table 1. Descriptive Statistics and Correlation Analysis

No	Variable	Mean	Std. Dev.	1	2	3	4	5	6	7	8
1	The firms' green behaviors	1.419	4.574	1.000							
2	Green customers	5.930	7.857	0.216	1.000						
3	Size	22.107	1.523	0.188	0.037	1.000					
4	Age	16.731	5.726	-0.086	-0.187	0.177	1.000				
5	ROA	0.038	0.775	0.002	-0.012	-0.010	-0.011	1.000			
6	Assets liabilities ratio	0.452	0.629	0.021	0.064	0.096	0.083	-0.364	1.000		
7	Research intensity	4.387	5.618	-0.082	-0.095	-0.218	-0.089	-0.090	-0.248	1.000	
8	Ownership of Top ten shareholders	44.744	24.787	0.142	0.035	0.434	0.075	0.008	0.066	-0.174	1.000

9	Polluted Industries	0.323	0.468	0.078	0.080	-0.020	0.001	0.000	-0.022	-0.220	0.034

In this study, the fixed effects regression method was used for analysis. Table 1 presents descriptive statistics and correlation analysis for all variables. From Table 1, it can be seen that the correlation coefficients between all variables are below 0.6. Meanwhile, the VIF of the model ranges from 1.21 to 5.76, with an average value of 2.46, which is less than 6. Therefore, there is no serious problem of multicollinearity in the model.

Table 2. Result of Regression

Variable	Model 1		Model 2		Model 3	
Green customers			0.160	***	-0.177	
			(0.046)		(0.093)	
Assets liabilities ratio	0.999	**	0.731		-0.526	
	(0.310)		(3.282)		(3.187)	
Green customers X Assets liabilities ratio					0.356	*
					(0.181)	
Polluted Industries	-5.988		-1.553		(0.847)	
	(3.495)	*	(10.914)		(10.489)	
Green customers X Polluted Industries					0.296	***
					(0.077)	
Size	0.699	***	2.309	**	1.357	
	(0.091)		(0.944)		(0.930)	
Age	-0.554	***	-0.597		-0.473	*
	(0.024)		(0.229)		(0.221)	
ROA	-0.310		12.287		10.961	
	(0.354)		(6.292)		(6.051)	
Research intensity	0.018		0.034		0.074	
	(0.011)		(0.136)		(0.131)	
Ownership of Top ten shareholders	-0.003		0.013		0.008	
	(0.004)		(0.039)		(0.037)	

Note. N=644. * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$ (two-tailed).

Year dummies and industry dummies are included.

Table 2 shows the results of regression using fixed effects. Model 1 is the basic model, which includes all control variables. Then we add green customers into Model 2 based on Model 1. Based on Model 2, we add an interaction term between green customers and assets liability ratio, and another interaction term between green customers and polluted industries in Model 3. In Model 1, we can see that the coefficient of firm size is significantly positive at the 0.001 level. It means that large firms are more paid attention to by the public due to their size, and

would like to take more green behaviors. Besides, the coefficient of age is significantly negative at the 0.001 level. Firms with elder age may hesitate to change and make green activities because of the organizational inertia problem.

Hypothesis 1 proposes that green customers positively promote the firms' green behaviors. From the results of Model 2, it can be seen that the coefficient of green customers is 0.160, which is significantly positive at the 0.001 level. It means that the greener the customers are, the more actively the firm takes green behaviors. Therefore, hypothesis 1 is supported. Hypothesis 2 proposes that the assets liability ratio strengthens the impact of customers on the firms' green behaviors. From the results of Model 3, it can be seen that the coefficient of the interaction term between green customers and assets liability ratio is 0.356, which is significantly positive at the 0.05 level. That is, the firms with high assets liability ratios are more affected by customers than the ones with low assets liability ratios, and take more actively green behaviors. Therefore, hypothesis 2 is supported. Hypothesis 3 proposes that polluted industries strengthen the impact of customers on the firms' green behaviors. From the results of Model 3, it can be seen that the coefficient of the interaction term between green customers and polluted industries is 0.296, which is significantly positive at the 0.001 level. That is, the impact of customers on the firms' green behavior is stronger in highly polluted industries than in low-polluted industries. Therefore, hypothesis 3 is supported.

6. Additional analysis

In our main analysis, we measure the green customers by the average score of the customers' green behaviors without considering that firms may be influenced by customers differently depending on their market share. Therefore, we put different weights for the customers' scores according to their market share and summed them up as a new measurement of the green customers. The result is the same as the main analysis. Besides, considering the assets liability ratio strengthens the impact of customers on the firms' green behaviors because of the firms' status to manage assets and liability, we test the moderating effect of cash and cash equivalents turnover rate and current asset turnover rate. We find the moderating effect of cash and cash equivalents turnover rate and the moderating effect of current asset turnover rate is similar to the assets liability ratio.

7. Conclusion

The paper focuses on the research about the Chinese-listed companies and examines the impact of customers on the firms' green behaviors. We have found that green customers positively promote the firms' green behaviors. Meanwhile, the firms with high assets liability ratios are more affected by customers than the ones with low assets liability ratios. In highly polluted industries, the impact of customers on the firms' green behavior is stronger than in low-polluted industries.

The research has the following theoretical contribution and practical implications. Firstly, the research analyzes the impact of customers on the firms' green behaviors and expands the research about the causes of the firms' green behaviors. Secondly, the study discusses the impact of the customers, which are one type of stakeholders of the firms. It helps enrich the

understanding of stakeholder theory. Thirdly, the research results can provide solutions for the government to support customer-side firms from the perspective of the supply chain, which may drive the green development of the overall supply chain.

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References

Cao, H., & Chen, Z. (2017). The driving effect of internal and external environment on green innovation strategy: The moderating role of top management's environmental awareness. *Nankai Business Review, 20*(6), 95-103.

Di Pasquale, V., Iannone, R., Nenni, M. E., & Riemma, S. (2023). A model for green order quantity allocation in a collaborative supply chain. *Journal of Cleaner Production, 396*, 136476. https://doi.org/10.1016/j.jclepro.2023.136476

Fontoura, P., & Coelho, A. (2022). How to boost green innovation and performance through collaboration in the supply chain: Insights into a more sustainable economy. *Journal of Cleaner Production, 359*, 132005. https://doi.org/10.1016/j.jclepro.2022.132005

Greenstone, M. (2003). Estimating regulation induced substitution: The effect of the Clean Air Act on water and ground pollution. *American Economic Review*, *93*(2), 442-448. https://doi.org/10.1257/000282803321947498

Huang, C. H., & Chang, H. F. (2019). Ownership and environmental pollution: Firm level evidence in China. *Asia Pacific Management Review, 1,* 1-7. https://doi.org/10.1016/j.apmrv.2018.09.002

Huang, W., & Chen, Z. (2015). Foreign investment entry, supply chain pressure, and Chinese corporate social responsibility. *Management World, 2*, 91-100+132.

Lin, H., Zeng, S. X., Ma, H. Y., Qi, G. Y., & Tam, V. W. Y. (2014). Can political capital drive corporate green innovation? Lessons from China. *Journal of Cleaner Production, 64*, 63-72. https://doi.org/10.1016/j.jclepro.2013.07.046

Marcus, A. A., & Anderson, M. H. (2006). A general dynamic capability: Does it propagate business and social competencies in the retail food industry? *Journal of Management Studies, 43*(1), 19-46. https://doi.org/10.1111/j.1467-6486.2006.00581.x

Melander, L. (2018). Customer and supplier collaboration in green product innovation: external and internal capabilities. *Business Strategy and the Environment, 27*(6), 677-693. https://doi.org/10.1002/bse.2024

Nair, A., Yan, T. T., Ro, Y. K., Okay, A., Chiles, T. H., & Lee, S. Y. (2016). How

environmental innovations emerge and propose in supply networks: A complex adaptive systems perspective. *Journal of Supply Chain Management*, *52*(2), 66-86. https://doi.org/10.1111/jscm.12102

Su, W., & Tsang, E. W. K. (2015). Product diversion and financial performance: The modifying role of secondary stakeholders. *Academy of Management Journal*, *58*(4), 1128-1148. https://doi.org/10.5465/amj.2013.0454

Zhang, Y. (2012). Benefit Based Inter-industrial Environmental Responsibility Allocation. *China Industrial Economics*, *07*, 57-69.