



The effects of public attention on the environmental performance of high-polluting firms: Based on big data from web search in China

Jun Cheng, Yuyu Liu*

School of Accounting, Southwestern University of Finance and Economics, Chengdu 611130, China

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ABSTRACT

Decades of rapid economic development in China have led to a growing public awareness of the importance of environmental protection. In addition to government regulation, public attention of companies is an important legitimacy-granting institution with the potential to influence corporate behaviour, as firms with high levels of public attention potentially bear more cost for pollution and other environmentally concerning actions. Using public web search volume data as a proxy for public attention to individual firms, this study explored the effects of public attention on the environmental performance of firms in high-polluting industries. We found that firms exposed to higher levels of public attention had better environmental performance, especially state-owned firms. This association was strengthened for firms located in cities with high environmental pressure or low economic development pressure. These results can help inform further efforts to promote and sustain environmentally friendly corporate practices in China.

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1. Introduction

After decades of rapid economic development in China, haze and frequent natural disasters have made people more aware of the importance of environmental protection. As the deterioration of the environment has largely been brought about by industrial development, the environmental performance of firms, especially those in high-polluting industries, has attracted much public attention. Thus, the Chinese government has begun to adopt a variety of environmental regulation measures to solve these problems (Liu and Wang, 2017). Meanwhile, public attention has become an important informal institution promoting corporate environmental protection behaviour. Under the pressure of both formal and informal institutions, companies have begun to use more environmentally friendly and recyclable materials for production, develop technological innovations (Almeida et al., 2018), adopt processes that optimize efficiency for cleaner production (Fan et al., 2018), use advanced management methods to improve corporate environmental performance (Clarkson et al., 2011), and so on.

China provides a very good research setting for exploring the effects of public attention on corporate environmental

performance. During the primary development stage of China, the focus was on economic growth. As the economy developed, people gradually became aware of the importance of environmental protection. Most Chinese citizens are concerned about environmental protection and are willing to make further efforts toward this goal. For example, one survey in China reported that nearly 90% of respondents were willing to pay for reductions in air pollution (Sun et al., 2016b). The new consensus is that beautiful scenery is as valuable as gold and silver mines. Thus, there have been many studies on environmental performance (He et al., 2017; Liu et al., 2017b; Maceno et al., 2018; Shetty and Kumar, 2016).

Many studies have discussed environmental regulation based on legitimacy theory. For example, negative media legitimacy can prompt corporations to release environmental information (Aerts and Cormier, 2009) or influence the relationship between commitment to the Kyoto protocol and accounting disclosures from polluting industries (Freedman and Jaggi, 2005). However, there is little literature discussing the effects of public attention as an important informal institution influencing the environmental performance of firms in high-polluting industries.

In this study, we examined the relationship between public attention and the environmental performance of high-polluting firms in China based on the big data provided by Web Search Volume Index of Chinese Listed Companies (WSVI). Further analysis explored the moderating effects of property ownership,

* Corresponding author.

E-mail address: yuyu1195@126.com (Y. Liu).

environmental protection, and economic development pressure by local governments. We used Poisson regression along with Bootstrap and Permutation tests to assess data for high-polluting firms listed in the Shanghai and Shenzhen stock exchanges from 2012 to 2016.

2. Literature review and hypothesis development

With rapid Chinese economic growth, environmental problems have become increasingly serious; the corresponding health risks have become a significant problem attracting much public attention in China (Lu et al., 2017). For the sake of healthy living and sustainable development, the public has begun to pay more attention to environmental protection and is willing to contribute to this goal (Sun et al., 2016a). In a modern democratic society, the power of public attention is huge, and can have a direct impact on the behaviour of both the government and companies.

Various studies have documented the increasing public attention regarding environmentally friendly production, including public perceptions of low-carbon cities in China (Cai et al., 2017), public attitudes toward modern coal-fired power plant projects in China (Liu et al., 2017a), public attitudes in Maine (USA) mill towns toward forest-based bio refineries (Marciano et al., 2014), and public attention regarding nuclear power in Australia (Bird et al., 2014). The influence of public attention on governmental behaviour has also been widely discussed; for example, prior studies argue that public attitudes toward biofuel can determine the speed of its market penetration (Filimonau et al., 2017). The public demand for environmental protection can prompt governments to take corresponding actions, such as pressuring the Chinese government to make greater efforts toward eliminating obsolete production capacity.

However, there has been little systematic analysis of the influence of public attention on the behaviour of firms, even though (according to legitimacy theory) corporate legitimacy is required for organizational survival (Braam et al., 2016). The legitimacy can be defined as “a generalized perception or assumption that the actions of an entity are desirable, proper, or appropriate within some socially constructed system of norms, values, beliefs and definitions” (Suchman, 1995). The legitimacy means there exists pressure from the subjective attitude of external stakeholders towards the company. For firms in high-polluting industries, they have legitimacy disadvantage due to public cognitive biases and their first mover defects. The information they disclose is one of the most important bases for public legitimacy recognition. Therefore, high-polluting firms are motivated to disclose the environmental protection related information for obtaining legitimacy. Studies have shown that more disclosure of environmental protection information can improve the legitimacy of business enterprises and thus improve the accuracy of financial analysts' predictions of stock prices (Cormier and Magnan, 2015). Further, compared to information disclosure, actual corporate behaviour is more credible environmental commitments. For example, if a firm has adopted policies or regulations encouraging the use of renewable energy and participation in the circular economy, this is seen as better behaviour than simple information disclosure, and it is more conducive to the transmission of positive signals to society.

In the context of modern China, the environmental performance of firms, especially in high-polluting industries, has gradually become an important aspect of legitimacy management behaviour. Legitimacy theory predicts that environmentally protective behaviour by firms will be affected by public opinion, which can magnify both the return on emphasizing environmental protection and the cost of poor environmental performance. Thus, firms under

greater public scrutiny will be more constrained in their environmental behaviour and have stronger incentives to take beneficial actions such as producing more environmentally friendly products, encouraging the usage of renewable energy, participating in a more circular economy, and so on. Our first hypothesis, motivated by the discussion above, is as follows,

Hypothesis 1. The level of a firm's public attention is positively associated with corporate environmental performance in high-polluting industries.

China has implemented an economic system based on the joint development of diverse forms of ownership. State-owned enterprises bearing both economic goals and policy objectives respond more positively to national development strategies and the needs of the people, so will be paid more public attention and thus are more concerned about public opinion. Compared to firms with lower levels of public attention, firms exposed to significant public scrutiny will face a greater return for choosing environment protection and greater cost for poor environmental performance. Therefore, we predict that public attention will affect state-owned firms more. These arguments lead to hypothesis below,

Hypothesis 2. The positive relationship between a firm's public attention and its environmental performance is stronger in state-owned enterprises.

The influence of public attention also can be moderated by local government behaviour. Under the current administrative system in China, local officials have great influence and control over local economic development. For example, the “Promotion Tournament”, in which the central government rewards local officials with promotion for achieving policy targets, operates as an incentive mechanism. Economic development is the highest priority in this system, but in different provinces, the weight of sub-goals changes over time. Local officials are always making trade-offs between the costs and benefits of environmental regulation.

When environmental issues are serious, the weight of environmental protection will increase and local officials will strengthen environmental regulation. Improving the public awareness of environmental protection is an important way for the government to carry out this policy. With high public attention on environmental protection, firms (especially in high-polluting industries) will carry out environmental innovation (Costa-Campi et al., 2017; Liao, 2018) and enhance their legitimacy. Consequently, the influence of public attention on environmental performance will be strengthened.

Meanwhile, when one city's speed of economic development is lower than surrounding cities in the same province, local government officials usually choose to catch up on economic development first, reducing the emphasis on environmental protection. In this situation, effect of government regulation on public attention is weak. Therefore, the cost of higher-pollution actions is lower with regards to public opinion, or can be made up through promoting GDP growth. In these circumstances, the legitimacy pressure faced by firms is lower and so the influence of public attention on the environmental performance of high-polluting firms is weaker. These arguments lead to two more hypotheses,

Hypothesis 3a. The positive relationship between a firm's level of public attention and its environmental performance is stronger for firms located in cities with more environmental pressure.

Hypothesis 3b. The positive relationship between a firm's level of public attention and its environmental performance is weaker for firms located in cities with more economic development pressure.

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