



## Diffusion of ISO 14001 environmental management systems in China: rethinking on stakeholders' roles

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### ABSTRACT

Since the release of ISO 14001 in 1996, China has witnessed a surge in the number of ISO 14001 certification. As an international environmental standard, ISO 14001 has two basic functions: one is playing as an environmental management instrument, while the other as a signal of firms' better environmental performance to stakeholders. Based on the stakeholder theory, we have examined the effects of community, regulatory and some organizational stakeholders on the diffusion of ISO 14001 certification at Chinese provincial levels. Using a panel data of ISO 14001 certification from each province for the period of 2004–2008 in China, empirical evidence of such relations is found. The finding reveals that signaling to foreign customers and community stakeholders plays a dominant role in encouraging diffusion of ISO 14001 certification. However, as an important organizational stakeholder, foreign investors have shown no significant effect on the diffusion of ISO 14001 in China.

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### 1. Introduction

Since the issuance of the ISO 14000 series in 1996, the number of organizations certified under the scheme has kept increasing (ISO, 2008; Perkins and Neumayer, 2010). ISO 14001 has gained wide popularity and recognition among businesses (Bansal and Bogner, 2002; Wu et al., 2007). People have started to be interested in the diffusion status of ISO 14001 in different countries, regions and industries. At the global level, some of studies have analyzed the effects of various economic, market, and regulatory factors on the diffusion of ISO 14001 certification (Neumayer and Perkins, 2004; Perkins and Neumayer, 2010; Prakash and Potoski, 2007). For example, Neumayer and Perkins (2004) found that the number of ISO 14001 certificates are positively correlated with the income of community, foreign direct investments, and exportation.

At firm or facility levels, the diffusion in the developed countries has become an important subject (Kassolis, 2007; Moria and Welch, 2008; Nishitani, 2009). Using econometric models to analyze the determinants of initial ISO 14001 adoptions in Japan, Nishitani (2009) found that stakeholders' environmental pressures acted as an important trigger for the increased number of adoption

of ISO 14001. Besides external pressures, organizational internal capabilities are also important drivers for the adoption of ISO 14001 (Perkins, 2007).

At the industrial level, Delmas and Montiel (2008) analyzed the factors that explained the international diffusion of ISO 14001 in the chemistry industry and found that the previous experience of businesses in voluntary standards, such as ISO 9000 certification, impacted positively on the adoption of ISO 14001 among chemical firms.

However, the effect of heterogeneous characteristics of regions in a country on the adoption rates of ISO 14001 has not caught much attention. In fact, the distribution of ISO 14001 certificates has significant heterogeneity at regional levels of a country. As shown in Fig. 1, the top ten provinces of ISO 14001 certification in China in 2008 have accounted for 76% of the total number of certificates; however, other 21 provinces only account for 24% of the total number of certificates (see Fig. 2).

China has witnessed a rapid increase in the number of ISO 14001 certification, which is ranked first in the list of top ten countries by the end of 2008.

The rapid diffusion of ISO 14001 in China has attracted researchers' interests (Cushing et al., 2005; Fryxell et al., 2004; Yin and Ma, 2009; Zeng et al., 2005). These studies focus on the motivation for ISO 14001 at firms' level. For example, Zeng et al. (2005) conducted a survey on the construction industry and found that the major motivation for ISO 14001 certification was

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E-mail address: [zengsaixing@sjtu.edu.cn](mailto:zengsaixing@sjtu.edu.cn) (S.X. Zeng).

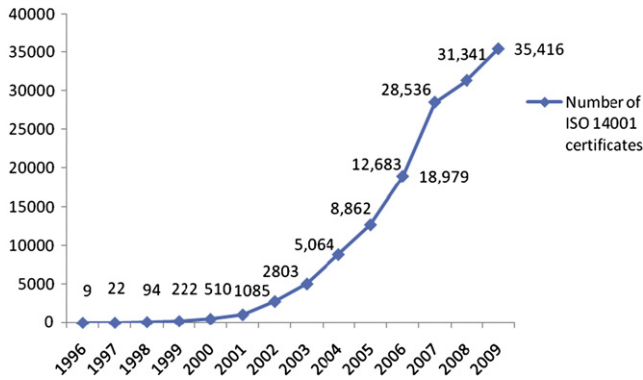


Fig. 1. Time-related distribution of ISO 14001 certification in China. Source: ISO website-<http://www.iso.org>.

responsive to the international market demand. Other researchers reveal that some of other motivations also affect firms' decision to ISO 14001 certification. These motivations include: to respond to the regulatory pressure, to improve environmental performance (Fryxell et al., 2004; Tam, 2008), and to facilitate international trades (Christmann and Taylor, 2001; Yin and Ma, 2009). Still, there is a paucity of research on the effect of provincial level stakeholders on the diffusion of ISO 14001 in China. As a result, the diffusion mechanism in the provincial level needs to be further understood.

Based on the stakeholder theory, firms' environmental strategy is influenced by the stakeholders' pressures (Frooman, 1999; Oliver, 1991; Pfeffer and Salancik, 2003). These stakeholders include, among others, regulations, the community and organizational stakeholders (Henriques and Sadorsky, 1999). The different interdependency of focused organizations and environmental stakeholders leads to the heterogeneous power of environmental stakeholders on the adoption of the proactive environmental strategy (Frooman, 1999; Harvey and Schaefer, 2001; Jawahar and McLaughlin, 2001; Kassinis and Vafeas, 2006; Mitchell et al., 1997; Murillo-Luna et al., 2008). For example, for firms having high resource dependent on customers, investors and the government, the stakeholders can implement directly influential strategies on firms' environmental management strategy or practices (Sharma and Henriques, 2005). The heterogeneous characteristics of stakeholder groups in the regional level will also influence the

firms' environmental management practices (Kassinis and Vafeas, 2006; Xia et al., 2008).

With the increasing concern from organizational environmental stakeholders about the quality of firms' environmental management, the certified environmental management system (EMS) can be used as a device to standardizing firms' environmental management practices. As a process standard, ISO 14001 specifies the sets of internal organizational management practices and creates an EMS for certification (Boiral, 2007; King et al., 2005). Firms can use the certified EMS to standardize their environmental management practices, increase internal efficiencies, and improve environmental performance (Darnall and Sides, 2008; Potoski and Prakash, 2005a). Firms, especially for those multinational enterprises (MNEs), proactively adopt EMS globally. This is echoed by some empirical studies that foreign direct investments (FDI) have proactive effects on the diffusion of ISO 14001 (Albornoz et al., 2009; Prakash and Potoski, 2006, 2007).

Besides the environmental management function, ISO 14001 can serve as a signaling device, informing firms' environmental stakeholders that they are proactively managing their environmental impacts efficiently (Johnstone and Labonne, 2009; King et al., 2005; Riley, 2001). By adopting EMS, organizations may be able to confer greater moral legitimacy for their environmental practices (Darnall et al., 2008; Zeng et al., 2010). Independent third-party certification can assure the effectiveness of organizational environmental management systems as well (Darnall and Sides, 2008; Madsen, 2009). Although, there lack empirical studies showing a positive relationship between ISO 14001 certification and improvement in firms' environmental performance (Anton et al., 2004; Barla, 2007), many empirical results support the argument that ISO 14001 certification has a proactive effect on the organizational environmental performance (Arimura et al., 2008; Iraldo et al., 2009; Potoski and Prakash, 2005b).

In this paper, based on the perspective of stakeholder pressures for ISO 14001 certification and signal perspective for ISO 14001 certification, we attempt to examine the role of different stakeholders in the diffusion of ISO 14001 using data set at the Chinese provincial level. We argue that ISO 14001 certification is the interactive result between stakeholders' pressure and firms' strategic response. The heterogenous characteristics of stakeholders indicate their different power on the adoption rate of ISO 14001 at a given region. These stakeholders include community, regulatory and

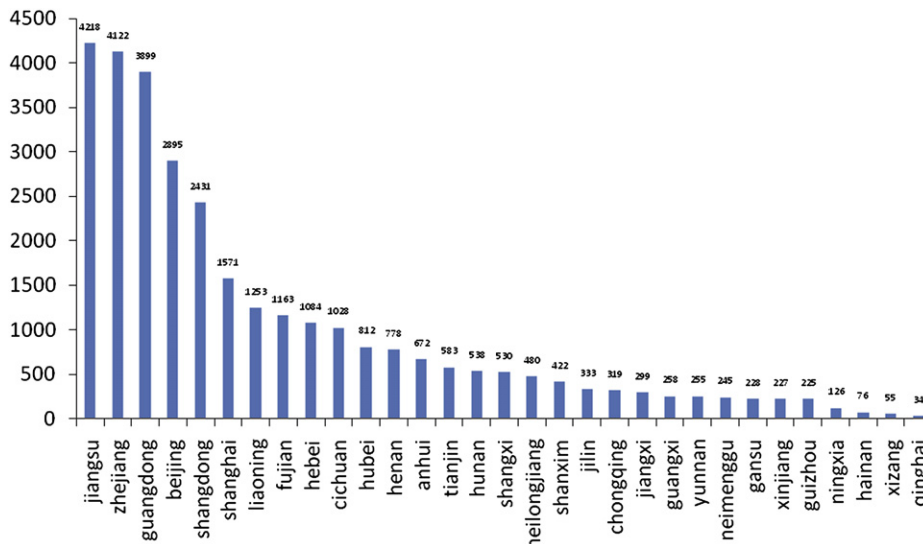


Fig. 2. Regional distribution of ISO 14001 certification in China. Source: CNAS website-<http://www.cnas.org.cn>.

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