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Environmental compliance and human capital: Evidence from Chinese industrial firms



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ABSTRACT

By using a unique cross-sectional dataset of Chinese industrial firms, this paper investigates the external and internal effects of human capital on firms' environmental performance. The result shows that firms have better environmental compliance because they are 'pushed' into compliance by the internal driver of human capital and 'pulled' to be environmental friendly by the external force of social human capital stock. This finding is robust when we take into account the possible endogeneity of human capital. In addition, evidence from this study suggests that the current situation of weak implementation of environmental supervision and evasion of environmental monitoring could be improved by promotion of internal and external human capital.

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1. Introduction

The increasingly serious level of industrial pollution poses a challenge to China's fast economic growth. Despite well-conceived laws, enforcement varies tremendously on the ground (Wang et al., 2003; Wang and Wheeler, 2005). Local governments' focus on economic growth and firms' resistance toward additional compliance have both brought about weak implementation (SEPA, 2006). Given this situation, it is important to understand the drivers behind compliance with environmental regulations and so, in this paper, analyze the factors behind compliance by using a unique environmental

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performance data of 2544 industrial Chinese firms. Now, there is already a large literature on regulatory compliance. Our particular focus is on the relationship between human capital and compliance which we consider a neglected aspect of the existing research. Conceptually, the relationship between human capital and industrial pollution can be through either an internal or an external route. Within the firm, the implementation of abatement technology is determined by the absorptive capacity of internal human capital endowment: the higher the level of human capital, the better the application within the firm. Outside the firm, higher educated people are more likely to tighten the stringency of environmental regulations by imposing pressure on environmental regulators. Based on the above descriptions, we hypothesize that (i) the internal effect of human capital pushes firms to voluntarily comply with environmental regulations and (ii) by enhancing regulatory pressure, the external effect of human capital also pulls firms to have better environmental performance.

We make three contributions to the existing literature. First, the paper sheds light on the internal and external effects of human capital on firms' environmental performance. Our results show that firms have better environmental performance because they are 'pushed' into making compliance decision by internal endowment of human capital, and 'pulled' by external forces of social human capital stock. Accordingly, better environmental performances are achieved based on the internal and external drivers of human capital.

Second, we take into account the possible endogeneity of both external and internal human capital. From the internal side, as shown by [Grolleau et al. \(2012\)](#), environmental-related standard (i.e. ISO 14001 standard) tend to improve the recruitment of professional employees. Such enhancement implies that better environmental performance can deliver more than environmental benefits and firms can strategically use environmental quality standards to attract high educated or high skilled employees who are more sensitive to environmental protection. From the external side, higher educated people may move to cleaner cities since they are more sensitive to environmental quality (in the sense of having higher willingness to pay for quality improvements). In short there is a potential for two-way causality between human capital and environmental performance. Most studies reviewed in Section 2 do not concern themselves with the endogeneity of human capital; our study on the other hand, better identifies the causal relationship between environmental performance and human capital.

Our third contribution is that we build a new database of firm-level data on environmental performance for China. [Blackman and Kildegaard \(2010\)](#) argue that most studies in developing countries rely on self-reported firm-level environmental data, which can be unreliable. However, instead of self-reported information, the environmental performance data we use is evaluated and compiled by a government environmental administration. Thus, our study may fill gap in the literature by providing evidence from the regulator-reported environmental data of Chinese industrial polluters.

The remainder of the paper is organized as follows. In Section 2, we give a brief review of the related literature on environmental performance and human capital, highlighting their connection through internal and external paths. Section 3 presents the data and explains the empirical methodology. Section 4 estimates the econometric models and discusses the results obtained. The final section concludes and derives policy implications.

2. Related literature

Human capital is an important internal factor that drives firms to voluntarily comply with environmental regulations. In order to adopt new technologies, firms must have a corresponding stock of human capital to acquire the requisite technical and economic information. Information acquisition may be passive, with firms absorbing information via day-to-day contact with business associates, or it may be active, with firms engaging in training and technical extension program. In either case, acquisition is greatly facilitated and accelerated by the firm's pre-existing stock of human capital, that is, the education and training of the workforce. Empirically, studies of green technologies adoption typically find that firms with more human capital are more likely to adopt new technologies of abatement and have better environmental performance, all other things being equal. For instance, in their study of Indonesian water polluters, [Pargal and Wheeler \(1996\)](#) find that average education level of employment is correlated with lower emission of water pollutant. [Dasgupta et al. \(2000\)](#) analyze the

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