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Firm-level innovation activity, employee turnover and HRM practices — Evidence from Chinese firms

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ABSTRACT

This paper examines the relationship between employee turnover, HRM practices and innovation in Chinese firms in five high technology sectors. We estimate hurdle negative binomial models for count data on survey data allowing for analyses of the extensive as well as intensive margins of firms' innovation activities. Innovation is measured both by the number of ongoing projects and new commercialized products. The results show that higher R&D employee turnover is associated with a higher probability of being innovative, but decreases the intensity of innovation activities in innovating firms. Innovating firms are more likely to have adopted high performance HRM practices, and the impact of employee turnover varies with the number of HRM practices implemented by the firm.

1. Introduction

Employee turnover can be an important mechanism for innovation activities in firms. Persistent differences in turnover between two otherwise identical organizations will evolve very different tenure distributions, with implications for stability and organizational culture which in turn may have considerably different implications for innovation. The level of turnover can be a result of the human resources management (HRM) practices chosen by the firm, but the HRM practices can also have a direct effect on innovation activities of the firm. This paper examines the relationship between employee turnover, HRM practices and innovation activity in Chinese high technology sector firms.

In the current stage of China's economic development, innovation is considered as one of the key factors for continued increase in total factor productivity and hence sustaining high growth; see e.g., World Bank (2011). Very little systematic evidence of the drivers of innovation activities based on firm-level data exists for China.[1] Empirical results from other (mostly advanced industrialized) countries, which are also rather scarce, do not necessarily generalize to the Chinese context, as labor markets in China are still relatively underdeveloped and protection of intellectual property rights remains weak. Moreover, Chinese firms also differ from Western firms with respect to corporate culture and a more important role for business groups and other networks.

For our empirical analysis we make use of data from a survey carried out by researchers at Renmin University (Beijing) in 2011. The sample consists of firms in China from five (high technology) industries: energy, electronic information, biotechnology, equipment manufacturing and environmental protection. In addition to standard controls in the analysis of innovation activities, the data set includes information about the firm's HRM practices as well as measures of employee turnover for different

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[1] In fact, we are only aware of one article (written in English) by Wei, Liu, and Herndon (2011) on this topic.

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categories, including technical personnel. The dependent variables in our analysis are the number of ongoing R&D projects and new commercialized products during 2010. The econometric analysis is performed using a hurdle negative binomial model for count data. An advantage of this model is that it allows for analyses of both extensive and intensive margins.

The empirical analysis shows that a higher turnover rate of R&D personnel is associated with a higher likelihood that a firm is innovating but a lower level of R&D effort and innovation performance in innovating firms. Particularly important HRM practices for enhancing innovation are the use of job description manuals and training programs. Notably, employee turnover has larger impact on innovation performance for firms using more high performance HRM practices. Among the other drivers of innovation, external network cooperation attaches an especially large and positive marginal effect. This is perhaps not so surprising in view of the importance of networks and business groups in the Chinese corporate system.

The remainder of the paper unfolds as follows. Next, a brief review of the previous studies of the relationship between HRM practices, employee turnover and innovation is given. The third section describes the data and the econometric method used. The results are presented and discussed in Sections 4 and 5, respectively. Section 6 briefly concludes.

2. Previous research

Since the mid-nineties a fairly large literature has built up dealing with HRM and firm performance. Performance is typically measured by productivity (surveyed in Bloom & van Reenen, 2011), while there is rather little (beyond case studies) on HRM and innovation.[2] Instead, the large innovation literature has mainly been concerned with firm size, product market competition, knowledge spillovers and R&D collaboration.

It is somewhat surprising that there is relatively little amount of work on HRM practices and innovation in view of the fact that the interest in new work practices emphasizing delegation of authority, empowerment of employees, information sharing and employee involvement, originated from the focus on the Japanese firms' organization of workplaces in which horizontal information flows play a key role. The interest in the Japanese work organization and job design was to a high extent due to the fact that they were largely considered as the main determinants of the high level of innovation and quality improvement that characterized Japanese firms; see e.g., Applebaum and Batt (1994).

The first two papers to look at the relationship between HRM practices and innovation were Michie and Sheehan (1999, 2003) in which the authors examined British firms' use of so-called high- and low-road HRM practices and how these were related to firms' R&D expenditures (the 1999 study) and process and product innovations during a three year period (the 2003 paper), respectively. They find that extensive use of modern (that is high-road) practices is positively correlated with investments in R&D and with process (but not product) innovations. Laursen and Foss's (2003) study investigates the bundles of work practices and the degree of novelty in product innovation in Danish firms and finds a positive relationship. Jimenez-Jimenez and Sanz-Valle's (2005) analyses of a relatively small sample of Spanish firms find that participative practices and promotion plans significantly increase the firm's innovation orientation.

In a more recent study, Zoghi et al. (2010) use Canadian longitudinal data to study how workplace organization is correlated with the adoption of process and product innovations. They find that decentralized decision-making, information sharing programs and (individual) incentive pay are associated with more innovations.[3] Another recent study by Zhou, Dekker, and Kleinknecht (2011) makes use of four waves of survey data from the Netherlands and finds that functional flexibility (measured by the rate at which people change their function or department within the firm) has a positive effect on the percentage of sales due to new products. Thus, this, as well as other studies, finds some evidence suggesting that internal labor mobility (functional flexibility, job rotation) is important for innovation activities.

Although there are a number of studies suggesting that especially the new, high involvement/performance work practices are implemented more frequently in innovative firms, the evidence is not very strong. Summarizing and concluding from the earlier empirical studies are difficult because these have not only made use of many different measures of innovation as the dependent variable but also included quite different measures of HRM practices. Moreover, it should be pointed out that the mechanisms behind the relationship are not well understood. A key candidate is that HRM practices promote learning processes of individuals as well as organizations (Cohen and Levinthal (1989), Shankar and Ghosh (2013)); for a systematic study of this mechanism for a developing country, see Santiago and Alcorta (2012).

Could we expect the relationship between HRM practices and innovation to be different in the Chinese case? A central element in the modern work practices is delegation of decision rights to employees. This may not, however, function well in a Chinese context where keeping distance to superiors and showing respect to elders are deeply rooted in the culture. Participative decision making also presupposes a high level of trust between employees at different levels in the hierarchy, which is often said not to be present in Chinese workplaces; see Wang, Yeung, and Zhang (2011) for empirical evidence. Another cultural difference that may weaken the effect of introducing modern HRM practices is that, in appraisals of performance, the employee's attitude and behavior is traditionally considered more important than the results of her performance.[4] There is to the best of our knowledge, only one earlier study, Wei et

[2] Notable exceptions are Michie and Sheehan (2003), Laursen and Foss (2003), Jimenez-Jimenez and Sanz-Valle (2005) and Zoghi, Mohr, and Meyer (2010). See also the recent survey by Laursen and Foss (2013).

[3] Notably, they also find, but do not discuss, that firms with a high vacancy rate (which is likely to be a sign of high employee turnover) are also more likely to innovate.

[4] Nevertheless, a number of studies have documented a positive relationship between the firm's use of strategic HRM practices and its performance (typically measured by subjective ratings of the overall performance of the firm); see e.g., Björkman and Fan (2002), Chow, Huang, and Liu (2008), Ngo, Lau, and Foley (2008), and Wei, Liu, Zhang, and Chiu (2008).