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# Does wage justice hamper creativity? Pay gap and firm innovation in China<sup>★</sup>



Mingli Xu<sup>a</sup>, Gaowen Kong<sup>b</sup>, Dongmin Kong<sup>c</sup>,\*

- <sup>a</sup> School of Public Administration, South China Normal University, China
- <sup>b</sup> School of Management, Jinan University, China
- <sup>c</sup> School of Economics, Huazhong University of Science and Technology, Luoyu Road 1037#, Wuhan 430074, Hubei, China

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#### ABSTRACT

Although the pay gap between executives and employees has received considerable attention, its economic consequences remain unclear due to the unavailability of data. In this study, we examine the effects of the pay gap on firm innovation by using data from Chinese listed firms. We show that: 1) the first-order effect of pay gap on firm innovation is significantly positive, supporting the tournament theory; 2) however, when pay gap is relatively high, the importance of comparison theories increases; 3) high management pay premiums provide incentives for management to devote to innovation activities, while pay premiums for ordinary employees impede firm innovation; and 4) both the employee's human capital and state ownership play significant roles in the negative effects of employee pay premiums on firm innovation. Overall, we provide critical insights and a serious challenge for regulators in China. The policy implications of this study could be of interest to regulators who intend to encourage firm innovation.

#### 1. Introduction

The pay gap between executives and employees has received more and more attention recently. For example, on August 5, 2015, the Securities and Exchange Commission of the United States approved a rule as part of the Dodd-Frank Wall Street Reform and Consumer Protection Act, requiring publicly traded companies to disclose the pay gap between CEO and ordinary employees, <sup>1</sup> which would provide a new weapon for organizations protesting against income disparity exacerbation and an extra reference for investors to decide whether to invest in a particular firm. However, opponents say that the rule would divert attention away from the

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<sup>\*</sup> Corresponding author.

 $<sup>\</sup>textit{E-mail addresses: } shmily@hust.edu.cn (M. Xu), kongdm@hust.edu.cn (D. Kong).$ 

 $<sup>^{1}\</sup> http://www.foxbusiness.com/politics/2015/08/05/sec-approves-ceoworker-pay-gap-rules.html. http://www.ibtimes.com/sec-approves-pay-ratio-rule-created-under-dodd-frank-act-2040380?rel=latest3.$ 

underlying causes of income inequality and only focus on the pay ratio.<sup>2</sup> Likewise, the Chinese government has also issued policies limiting executive pay in state-owned enterprises (SOEs). Since January 1, 2015, a salary reform scheme for central enterprise principals has been implemented, targeting some 200 executives from 72 SOEs, and putting in place a ceiling for executive-worker pay ratio, which has been trimmed down to about eight times.<sup>3</sup>

Although an emerging literature takes up the task of trying to understand the economic effect of pay gaps within a top management team (Lee, Lev, & Yeo, 2008; Kale, Reis, & Venkateswaran, 2009), between managers and ordinary employees (Faleye, Reis, & Venkateswaran, 2013; Firth, Leung, Rui, & Na, 2015; Banker, Bu, & Mehta, 2016), and within ordinary employees from a firm (Lallemand, Plasman, & Rycx, 2004), few empirical studies examine the link between intra-firm pay gaps (which denotes the pay dispersions between managers and ordinary employees) and firm innovation. In this paper, we try to contribute to this nascent literature by examining how intra-firm pay gaps affect innovation output.

Innovation is an important factor considered by both policy makers and firms. Innovation upgrades a firm's comparative advantage (Porter, 1992) and is a critical driver of economic growth (Solow, 1957). Nurturing innovation is of considerable importance to China because it has identified building an innovative country as a national development strategy. However, promoting innovation is a challenge for most firms (Tian & Wang, 2014). Belloc (2012) argues that the core component of firm innovation is the process through which individuals integrate their human capital and physical resources within the firm. Although shareholders' investments are thought to be the only fundamental source of productive activities, superior profit sharing provides incentives for employees (including the management group and ordinary employees) to devote their skills and efforts to the innovation process (Lazonick, 2003).

Prior studies show that a number of firm characteristics could affect managerial or employee incentives on participating in innovation activities. For instance, the innovation incentives of managers are motivated by a larger institutional ownership (Aghion, Van Reenen, & Zingales, 2013), corporate venture capital (Chemmanur, Loutskina, & Tian, 2014), private equity ownership (Lerner, Sorensen, & Strömberg, 2011; Bernstein, 2015), greater tolerance for failure (Ederer & Manso, 2013; Tian & Wang, 2014), lower analyst coverage (He & Tian, 2013) and higher promotion-based tournament prize for non-CEO executives (Jia, Tian, & Zhang, 2016). Meanwhile, employee incentive is also important in innovation activities, for example, non-executive employee stock options have a positive effect on firm innovation (Chang, Fu, Low, & Zhang, 2015) while unionization impedes firm innovation (Bradley, Kim, & Tian, 2016). Therefore, to maximize the utilization of both the management group and ordinary employees, firms need to establish proper incentive mechanisms to motivate them to engage in activities that promote innovation (Gupta, Tesluk, & Taylor, 2007). However, few empirical studies integrate both the managerial and employee incentives in innovation process.

In fact, both the management groups and ordinary employees play important roles in innovation activities. It is easy to understand the importance of managers since they are the decision-makers of R & D investments in firms (Barker & Mueller, 2002), the separation of ownership and control of listed firms makes managerial incentive an issue for firms to mitigate managerial myopia and induce the management to engage in value-enhancing innovation activities (He & Tian, 2013). Meanwhile, rank-and-file employees are also not that inessential. Even the blue-collar workers, who seem to be less obviously associated with innovation activities at first blush, could have both direct and indirect effect on innovation, on one hand, many patentable ideas are initially generated by them since their advantages in closest contacts with production; on the other hand, they may affect innovation productivity since they often serve as supporting staff for scientists and engineers (Bradley et al., 2016).

For the above reasons, we conduct our research from the perspective of pay gap between management group and employees (which we will interchangeably refer to as intra-firm pay gap or firm pay gap). We argue that the firm pay gap can affect firm innovation by affecting the incentives of both managers and employees. In the literature, there are two competing theories that describe the economic incentives of pay gaps, the tournament theory and comparison theories.

The tournament theory was first formulated by Lazear and Rosen (1981) and subsequently extended by Rosen (1986), and proposes that firms motivate employees by setting up a hierarchy of compensation. Payment at a given level in the organizational hierarchy induces effort from employees at both its own level and the next lower hierarchical level (Rajgopal & Srinivasan, 2006). Consistent with the tournament theory, empirical evidence has found that the pay gap is positively associated with firm performance (Lallemand et al., 2004; Lee et al., 2008; Kale et al., 2009; Banker et al., 2016; Jia et al., 2016).

In contrast, comparison theories, which includes social comparison theory (Festinger, 1954), equity theory (Adams, 1965) and relative deprivation theory (Martin, 1981), have been widely used in organizational research to explain individual reactions to pay. Individuals expect rewards to be distributed commensurate with their own contribution and evaluate themselves (the equity of their exchange relationships with their firms) by comparing with reference groups. If their input-outcome ratios are lower than those of the reference groups, the feelings of inequity or deprivation would be stronger (Festinger, 1954; Adams, 1965; Martin, 1981). Moreover, individuals attempt to resolve the tension generated by inequity by modifying their feelings about either their own or their reference group's inputs and/or outcomes, by changing their actual inputs (e.g., reducing work effort and/or attendance rate) or outcomes (e.g., asking for extra compensation), by terminating perceived inequitable relationships (e.g., leaving their organizations), or even retaliating regardless of their own welfare (Cowherd & Levine, 1992). Researchers have found that increased pay dispersion in organizations is associated with higher managerial turnover, less collaboration and lower productivity (Bloom & Michel, 2002; Firth

 $<sup>^{\</sup>mathbf{2}}\ \text{http://www.wsj.com/articles/should-congress-rescind-the-pay-ratio-rule-1456715962.}$ 

<sup>&</sup>lt;sup>3</sup> http://www.chinadaily.com.cn/business/2015-01/05/content\_19235462.htm.

On September 16, 2009, a guideline to regulate the salaries for executives in the country's 135 centrally-administered state-owned enterprises was announced by six administrative departments of China's central government, stipulating that the executive pay shall not exceed 20 times the pay of the average worker. http://www.chinadaily.com.cn/china/2009-09/16/content\_8700389.htm.

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