



## Why do firms adopt stock options and who benefits? A natural experiment in China



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### ABSTRACT

A regulatory change in 2006, permitting equity compensations in China, offers a natural experiment to investigate drivers and outcomes of stock options. There are two unique features. First, adoption of stock options occurred rapidly compared to the US, where stock options have been around for more than 100 years with periods of high (1990s) and low (before 1950s) adoption. Second, stock options have been issued by state-owned enterprises (SOEs), an unusual aspect. This study analyzes all listed companies in China from 2004 to 2014, testing two competing theories: optimal contracting and managerial power. If managers own more equity, if the CEO also serves as board chairman and if compensation committees exist, managers are more likely to receive stock options. Ownership type and firm characteristics are also essential factors in granting stock options. In non-SOEs, evidence suggests that controlling shareholders award stock options less frequently but if they do they seem to induce managers to collude in tunneling. Applying a propensity score matching approach to account for an alleged self-selection bias, we do not observe any improvements in firm performance or shareholder value after stock options have been issued. Accordingly, managerial power seems to be the predominant driver for the introduction of stock options. Hence, managerial accountability and better disclosure are essential to ensure that stock options do contribute to value creation.

### 1. Introduction

On 31st of December 2005, the China Securities Regulatory Commission (CSRC) released the 'Measures for the Administration of Stock Incentive Plans of Listed Companies', permitting equity compensations. Hence, China offers a natural experiment where the adoption of stock options occurred in a 10-year narrow window as compared to the US, where stock options have been used for more than 100 years with varying degrees of popularity. Given this unique setting, our study can explore early and late adopters of equity compensations from 2004 to 2014, revealing their motives and assessing whether stock options enhanced firm performance and shareholder value.

Having been widely adopted and analyzed in developed countries, stock options have long been regarded as an incentive mechanism to align CEOs' and shareholders' interests and to alleviate moral hazard problems (Yermack, 1995; Core and Guay, 1999). However, these mechanisms rely on a market-based governance system, where efficient stock markets reflect firm performance accurately. In spite of a long history of regulatory changes (Gao and Kling, 2006) and signs of improved efficiency (e.g. in the context of calendar anomalies, Kling and Gao (2005)), Chinese stock markets are not yet at par with their Western counterparts, and governance issues remain (Gao and Kling, 2008; Kling and Gao, 2008). Assessing why some firms adopted stock options, while others did

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not, and identifying who ultimately benefited is crucial in evaluating China's recent compensation reform.

Chinese stock options have been rarely studied with only a few exceptions (Conyon and He, 2011; Fang et al., 2015), as it is a relatively new phenomenon. Thus, it has remained unclear what affects the decision to introduce stock options and whether desired outcomes can be realized. Despite ongoing market-oriented reforms, China still exhibits higher ownership concentration, less developed stock markets and weaker legal protections compared to Western economies. According to our data, over 62% of the listed firms have a controlling shareholder who owns over 30% of the firms' outstanding shares, and the average ownership of controlling shareholders of all listed firms is 37%. By contrast, it is rare for investors to own more than 10% of the outstanding shares in Anglo-Saxon economies (Conyon and He, 2011). Furthermore, the state still plays a significant role in the economy through state-ownership, administrative governance and regulations (Gao and Kling, 2012). This unique institutional setting casts doubts on the real motivations and impacts of stock options. Why do state-controlled enterprises (SOEs) or companies dominated by a principal shareholder need stock options? And most importantly, is there any evidence on their value-enhancing capabilities.

Empirical studies on equity compensation in developed countries yield conflicting results. Yermack (1995) indicates that agency or financial contracting theories cannot explain the pattern of stock options awarded to CEOs in the US. He tests nine hypotheses based on agency theory, only finding support for two. More recently, based on a US sample from 1982 to 2001, Kim and Ouimet (2014) document that the number of employees and the size of options influence the benefits of incentives schemes. They argue that stock options are most effective in firms with a small number of employees and where options account for a small fraction of firm value. In contrast, large equity compensation packages are often implemented for non-incentive purposes and thus do not improve firm performance.

Previous literature on Chinese executive compensation has mainly focused on cash payments (Firth et al., 2006; Chen et al., 2010, 2011), while equity compensation has been largely omitted due to data availability - except in the case of Hong Kong. Yet, the institutional background of Hong Kong is quite different from mainland China. Chen et al. (2013) analyze the stock options of red chip firms listed in Hong Kong and argue that stock options granted by state-controlled red chip firms are not effective. For mainland China, Chen et al. (2010) based on the managerial power perspective argue that CEO duality and CEO shareholding entrench managers to extract firms' assets; however, they only analyze cash compensation. Conyon and He (2012) investigate the determinants of CEOs' share-ownership and equity compensations based on agency theory.<sup>1</sup> They argue that there is little evidence that governance variables influence CEO pay. By contrast, a more recent study by Fang et al. (2015) yield conflicting results while investigating the employee stock options covering almost the same period. They find no relationship between executive stock ownership and options granted and report a negative correlation between board size and stock options. They also argue that employee stock options in China improved firm performance, and that better corporate governance enhanced this positive impact. Therefore, the understanding of equity compensations in China is far from clear, and it is essential to evaluate recent data.

This paper attempts to fill this gap by addressing the following research questions. First, why and under what circumstances did Chinese firms adopt stock options? Particularly, are stock options in Chinese firms an incentive device to solve agency problem or just a form of managerial discretion? Prior literature (Yermack, 1995; Conyon and He, 2012) is mainly based on the optimal contracting approach arguing that incentive compensation aligns shareholders' and managers' interests. By contrast, Bebchuk and Fried (2003) propose the managerial power approach arguing that compensation arrangements themselves could be part of an agency problem, because managers are able to exert influence over the pay arrangements to extract private benefits. This paper tests both approaches. Second, do corporate governance and ownership structure affects stock options? As discussed earlier, the Chinese institutional background is quite different from other developed countries despite continuous reforms. Finally, and most importantly, do stock options improved firm performance and shareholder value? Put differently, who benefits from stock options, managers or shareholders?

To address these research questions, we analyze a comprehensive database of Chinese listed firms from 2004 to 2014, covering the complete and most recent period during which stock options have been adopted. There are analytical problems related to an alleged self-selection bias as well-performing firms enjoy better market valuation, increasing the propensity to grant stock options (Bergman and Jenter, 2007). These firms are more likely to present better post-event firm performance due to positive auto-correlation between past and present performance. To address this potential bias, we apply a propensity score matching method, comparing firms that adopted stock options to their matched control group and the unmatched sample.

Our study yields the following insights. First, managerial power plays a significant role in stock options granted by Chinese firms. Our results indicate that managers are more likely to be awarded with stock options if they hold higher equity shareholdings in the firm, if the firm has a compensation committee and if the CEO is also the chairman of the board of directors. Second, ownership type matters. In line with previous literature (Conyon and He, 2011; Chen et al., 2010), we find that state controlled firms are less likely to adopt stock options. However, we do not observe a significant impact of ownership concentration, which is in line with Fang et al. (2015) but contradicts Conyon and He (2012). Third, firms with younger executives are more likely to award their managers with stock options. Fourth, firm characteristics are also essential in the decision to issue stock options. We show that financial leverage, firm size and growth opportunities are important factors in shaping executive pay packages. Prior firm performance also influences stock options positively. In addition, high technology firms are more likely to grant options. Finally, controlling shareholders play a role in non-state controlled firms. Non-SOEs controlled by a shareholder tend to issue stock options less frequently as incentives should matter less given the direct control. Yet, if controlled firms issue stock options, tunneling seems to increase, suggesting that stock options are awarded to managers to induce them to collude with the principal shareholder.

<sup>1</sup> Conyon and He (2012) include stock options, restricted stock and share appreciation rights as equity compensation in their study.

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