Proposal of Joint Research Programme For Young Talents
青年人才合作培养项目申请表

Section 1. Details 研究项目信息	
Research Topic 项目名称	Non-compete Enforceability and Employee Compensation: Evidence from Non-executive Employee Stock Options
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Your Department 学系	Finance

Section 2. Overview of Research Project 研究概述	
Research Background 研究背景	This project focuses on why firms grant non-executive employee stock options. In the literature, why firms grant employee stock options to rank-and-file employees is inconclusive. On the one hand, some studies show that non-executive employee options have salient incentive effect. For example, Hochberg and Lindsey (2010) find that the pay-for-performance sensitivity created by employee stock options enhances firms' operating performance by facilitating mutual monitoring and cooperation among rank-and-file employees. Chang et al. (2015) document that non-executive stock options promote corporate innovation by encouraging employees' risk-taking incentives in the innovation process. On the other hand, some studies (e.g., Hall and Murphy, 2003; Oyer and Schaefer, 2005) show that the observed option grants are too small to provide strong incentives for non-executive employees and firms grant options to employees mainly for retention purpose.
Research Objects 研究目标	By exploring exogenous shocks to employee mobility, we try to identify the reasons why firms grant stock options to rank-and-file employees.

Research Questions /Issues **研究问题**	We aim to investigate the motives of firms to grant stock options to rank-and-file employees. A key challenge in this research question is to disentangle the risk-taking incentive and the retention motive in granting non-executive employee stock options. While the risk-taking incentive induced by non-executive stock options is still under debate, the retention motive is widely accepted as an important determinant of firms offering non-executive employee stock options (Core and Guay, 2001; Oyer, 2004; Oyer and Schaefer, 2005; Aldatmaz, Ouimet, and Van Wesep, 2017). Because the retention and incentive motives simultaneously affect firms' option-granting decisions in the same direction, it is difficult to separate the two motives. For instance, firms in New Economy industries, where the needs of both retention and risk-taking incentive are strong, tend to grant more employee stock options than firms in Old Economy industries (Hall and Murphy, 2003). In this project, we plan to employ an exogenous legislation shock to separate the two motives for firms to grant non-executive employee stock options.
Research Design and Methods **研究设计与方法**	We plan to use the change in non-compete enforceability across U.S. states as a quasi-natural experiment to empirically investigate the motives of firms granting non-executive employee stock options. Non-compete agreements (or, "non-competes") are restrictive covenants that ban workers at a certain company from going to work for a competing employer or launching a new competing company within a certain period of time after leaving a job. According to a 2016 Whitehouse report, about 20% of American workers are currently bounded by non-compete covenants, and roughly 37% workers have ever signed non-compete agreements during their career. In a non-compete survey project, Starr, Bishara, and Prescott (2017) find that almost all professions use non-compete contracts, though with difference level of prevalence. Architecture engineering (36%) and computer/mathematical (35%) occupations have the highest prevalence of non-competes, while farm, fishing, and forestry have the lowest incidence (6%). Kaplan and Strömberg (2003) show that approximately 70% of VC financings in US are covered by non-compete agreements. Leonard (2001) finds that nearly 90% of technical workers and upper-level management have signed non-compete agreements. Non-competes are not only found in high-skilled professions but also covering a large number of low-wage workers. Starr, et al. (2017) find that 15% of workers without college degrees are subject to non-competes, while 14% of employees earning less than $40,000 have signed employment contracts with non-competes covenants. The prevalence of non-competes in the U.S. are similar across states, ranging between an incidence of 17% to an incidence of 19% (Prescott, Bishara, and Starr, 2016). Nevertheless, the strength of enforcing non-competes varies from state to state. Some states, such as California, do not enforce non-competes except in rare cases, whereas others, such as Massachusetts, routinely enforce them (Gilson 1999). As discussed in Prescott, et al. (2016), most states enforce non-competes under

	"reasonable" conditions, yet the standard of "reasonable" conditions differs. For instance, Colorado courts will only enforce a non-compete against someone in upper management, and New York courts will not enforce a non-compete against someone who is involuntarily dismissed. Some states like Wisconsin will simply refuse to enforce a non-compete if it is "unreasonable", while other states like Florida allow to modify "unreasonable" non-competes before enforcing it. Oregon requires companies to give a two-week advance notice of any non-compete to employees before beginning their employment. Previous literature has documented various effects of the change of state-level non-compete enforceability on corporate policies. Garmaise (2011) shows that firms in a state tend to reduce executive compensation and replace equity-based compensation with salary after the state tightens its enforcement on non-compete covenants. Exploiting Michigan's inadvertent reversal of non-compete enforcement in 1985, Marx, Strumsky, and Fleming (2009) find that the enforcement of non-competes reduces mobility of inventors especially those with firm-specific skills and those working in narrow technical fields. In the same setting, Younge and Marx (2015) show that non-compete enforcement enhances firm value by an average of 9% in the short run. Samila and Sorenson (2017) explore the interactive effect of venture capital supply and non-compete enforcement on firms' innovation outcome and find that venture capital promotes innovation of firms headquartered in states with weaker non-compete enforcement. Starr, Balasubramanian, and Sakakibara (2017) find that employees of firms in states with stricter enforcement of non-competes are less likely to found a new competing firm. But the effect is mainly coming from employees with lower human capital. Starr (2017) find a positive impact of non-compete enforceability on firm-sponsored trainings to employees but no impact on employees' self-sponsored trainings. The study of Chen, Zhang, and Zhou (2017) suggests that stricter enforcement of non-competes exacerbates managerial myopia in meeting short-term earnings targets. The staggered changes in non-compete enforceability across states in the U.S. can help to disentangle the retention motive from the risk-taking incentive motive of firms granting stock options to non-executive employees because these two motives predict contracting effects of stricter non-compete enforceability on non-executive employee stock options. The retention motive predicts a negative impact of stronger non-compete enforceability on employee stock options. After signing a non-compete agreement, employees are legally prevented from accepting job offers from competing firms. These employees will have fewer opportunities to develop their careers outside of their current companies. Gilson (1999) regards non-compete agreements as the most important legal mechanism for reducing interfirm mobility. Marx, Strumsky, and Fleming (2009) use Michigan's 1985 reversal of its non-compete enforcement policy as a natural experiment, and show that the increased non-compete enforceability significantly reduces inventors' mobility. Marx (2011) shows that, when subjecting to

non-competes, employees are more likely to change industries when changing jobs to avoid a potential lawsuit. Due to the decrease in outside opportunities, employees will lose their individual bargaining power on negotiating their compensation. A 2016 Treasury report points out that, stricter non-compete enforcement can result in both lower wage growth and lower initial wages. Specific to employee stock options (a type of compensation which is used frequently to retain employees), stricter non-compete enforceability weakens firms' motive to retain employees, and thus will reduce their grant of employee stock options. Based on these arguments, we expect that an increase in non-compete enforceability, which reduces employee mobility, weakens firms' incentive to retain employees by granting more employee stock options.

The incentive motive, however, predicts a positive impact of stricter non-compete enforcement on employee stock options. In the context of increased non-compete enforcement, reduced mobility makes it difficult for employees to get the fair value of their human capital from a competitive labor market. This can result in great disincentive effect especially for firms investing heavily in risky-taking activities such as innovation. In the presence of reduced mobility, employees have fewer opportunities to cash out their personal benefits in case of successful innovation activity via the labor market bargaining, but are more likely to suffer from the loss of failed innovation investment since their career is more bounded within the firm. This will discourage employees to invest in their firm-specific human capital development and force firms to grant more non-executive stock options particularly when the needs for employees' risk-taking are stronger. Based on the incentive explanation, we expect firms to increase their employee stock option grants when facing strengthened non-compete enforcement.

Using the amendments of non-compete enforceability in three U.S. states, i.e., Texas, Florida, and Louisiana, during 1992-2004 as a quasi-natural experiment, we will examine how legal constraints on employee mobility affect firms' grants of stock options to non-executive employees using a difference-in-differences (DiD) approach for a sample of public firms covered by the ExecuComp.

Following prior literature (e.g, Garmaise, 2011; Starr, Balasubramanian, and Sakakibara, 2014; Chen, Zhang, and Zhou, 2017; Samila and Sorenson, 2017), we will measure the state enforceability of non-competes using Garmaise's (2011) enforceability index for all jurisdictional regions in the U.S. Our measure of non-executive employee stock options will be the Black-Scholes value of non-executive stock option grants per employee as in Oyer and Schaefer (2004), Bergman and Jenter (2007), Kedia and Rajgopal (2009), and Kumar, Page, and Spalt (2011).

After obtaining the baseline results, we will perform several tests to alleviate selection bias, omitted variable bias, and reverse causality bias. Furthermore, we will explore how our results vary across different firm and industry characteristics to further substantiate the channel through which non-compete enforceability affects

	firms' incentive to grant employee stock options.
Deliverables /Expected Outcomes 研究交付/预期研究成果	We expect to finish one working paper within one year and submit it to a top finance journal.