### Abstract

Recent studies on return of higher education show that the investment on elite universities is substantial. Accessing elite universities could yield a sizable premium wage. However, no study was able to distinguish what extent this premium wage is due to its human capital or its signaling effect. To potentially distinguish its signaling effect, we studied the short-term effects of enrolling into elite universities in China's higher education institutes by using a regression-discontinuity design (RDD). To achieve this goal, we used a randomly sampled with more than 14 thousand first-year students from 22 universities. We found that there was a substantial signaling effect in enrolling into elite universities. Accessing elite universities could significantly increase student expected monthly salary.

### Introduction

Knowledge about returns on investments in education, which have been estimated since the late 1950s, are predominantly used in educational investment decisions (Psacharopoulos and Patrinos, 2006). In practice, the rate of return (RoR) estimate is often focusing on the causality between schooling and earnings (Card, 2001). Although it is generally understood in a sense of human capital investment, it is in fact difficult to distinguish the signaling effects from the human capital effects based on the earnings.

The goal of this study is to examine the short-term effects of enrolling into elite universities on student expectations about their future labor market performance in China's higher education. The short-term, in our case, indicates that there has not yet been any human capital accumulation right after students' enrolling into the elite (as opposed to non-elite) universities. However, the signal effects could play an immediate effect after the enrollment. In our study, we specifically focus on students' expected earnings, job-searching opportunities and other psychological outcomes.

We believe this is the first study in China's higher education trying to estimate the signaling effects on education and earnings. We argue that, taking the signaling effect in educational investment into consideration, RoR estimate based on earnings might be misleading.

### Sampling and Data Collection

To achieve the above goal, we conducted our study in Hunan province in China. Hunan province is located in central China, with a per capita GDP 6000 USD, ranked 10th out of the 31 provinces or regions. We randomly selected 22 universities out of the four-year national registered universities, and in each major we randomly sampled 16% first-year students. The total was about 15 thousand first-year college students from 22 universities.

We conducted our survey at the end of October 2016, one month (right after their first-month military training) after the first-year students enrolled into the university. The data was collected with detailed students' socio-economic background, their college majors and CEE scores. Besides these, we also measured students' future expectations, their general self-efficacy, study adaptation and study motivations.

### Results

First, from Figure 1 we find that the rating variable (CEE, scores) is normally distributed over two different groups measured before treatment, and there is a large group of students with CEE scores around the cut-off point.

We first conducted our graphic analysis, from Figure 2 we found that there exists a significant discontinuity between students who enrolled into an elite university versus students who enrolled into a non-elite university. For example, students who just enrolled into an elite university show a significant higher expected monthly salary than their peers who failed to enroll into an elite university. The same trend can also be observed from student expectation in doing a master or PhD study. However, when we examine the probability in finding a major-matched job, being enrolled an elite university in fact lessened student expectation in finding a major-matched job.

### Discussion & Conclusions

Therefore, we conclude that First, there might exist strong signal effects in accessing elite universities relative to non-elite universities. Second, this signal effect might be both positive and negative on student outcomes. It requires further exploration to understand the causal mechanisms to different outcomes. Third, a single country study could reveal the existence of signaling effects; however, it can hardly show how large this signal effects are relative to their human capital effects in higher education investment. Further studies are needed.

### References