College Licensing and Reputation Effects on the Labor Market

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Abstract

Typically, less advantaged students are more likely to enroll in low-quality universities: we document that this was the case in Peru, a country that imposed new regulations aimed at shutting down predatory colleges in the period 2016-2021. 50 universities, out of the existing 144, were denied an operational license and had to cease their activities based on noncompliance with a set of basic quality standards. Using a new dataset on labor market outcomes of the 2014-2019 cohorts and a difference-in-differences approach, we estimate the cost of this policy for recent graduates using, taking advantage of the staggered nature of licensing decisions. We find that, within one year from the licensing decision, graduates from colleges that obtained a license have higher wages and lower working hours; graduates from universities whose license was denied had no significant effects on their labor market outcomes. This suggests that employers were aware of quality differences between colleges before the licensing process, and that regulation might have come at low cost to recent graduates.

1   Introduction

Over the last two decades, improving education quality has become a central issue in the agenda of Latin American policymakers: at the higher education level, college regulation has been implemented in countries such as Brazil, Ecuador, and Peru (Marta Ferreyra et al. (2017)). This is a response to the observation that increased attainment levels have been corresponded by stagnating attainment rates and trailing growth (Hanushek and Woessmann (2012)). Among other measures, much attention has been given to helping students in the choice of better institutions: Altbach et al. (2009) points out the growing need for a system that measures and regulates the quality of educational services, allowing students to distinguish legitimate institutions from predatory ones.

In this paper, we focus on the effect that the public signals sent by quality certification reforms have on the labor market outcomes of recent graduates. Previous studies have shown positive returns to college reputation (Macleod et al. (2017), Anelli (2020), Sekhri (2020)); in this setting, firms are likely to update their beliefs regarding college graduates based on the outcomes of the regulation process. This can make recent graduates winners on losers, depending on the direction and size of the update. In this paper, we study the case of a major higher education reform in Peru, where compliance with a set of basic quality standards was enforced: colleges that failed to meet certain criteria were denied an operational license and had to cease their activities. The licensing decisions were announced over the period 2016-2021 and resulted in the closure of a total of 50 universities out of 144.

In partnership with the Ministry of Education and the Ministry of Labor, we combine administrative data from college records and match it with monthly firm tax-records. This data allows us to show that less advantaged students are the more likely to attend bad colleges, and that licensing decisions closed the colleges with the lowest returns. We then take advantage of the staggered nature of licensing decisions to esti-

mate a difference-in-differences model, exploiting within-college variation in the labor market outcomes of recent graduates. Separate models are estimated for graduates of colleges who received or were denied a license. This approach addresses the systematic differences in earnings of graduates from different colleges and provides us with suitable comparison groups.

Our preliminary analysis of short-term effects shows positive effects for recent graduates of colleges which were granted a license. We find that, conditional on being employed, monthly wages increase by about $USD20$ while total monthly hours decreased approximately 8 hours. Interestingly, we find small and negative effects on employment, which could be due to increased entrepreneurship or to graduates deciding to pursue masters or PhD degrees. On the other hand, graduates from universities that were denied a license experience small, non-significant effects for all outcomes. This suggests that employers did not update their beliefs about quality at these institutions following the licensing process: if this was the case, the regulation might have come at low cost to their graduates.

This paper is linked to various branches of the economics literature. First, it relates to papers studying the use of private or public signals for hiring decisions. We expect that the licensing process affected the labor market outcomes of university graduates, as it generated better information about the quality of education provided by different universities.[1] The inadequate education of the workforce is considered a central problem by 28% of Peruvian companies (MINEDU (2020a)). Certifying graduates' knowledge and skills could affect hiring decisions by reducing employers' uncertainty over their productivity. For example, Rockoff et al. (2012) shows that when school principals use teacher performance measures to update their beliefs as predicted by standard learning models. Eble and Hu (2021) finds that employers were not swayed by Chinese

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[1]This could potentially affect the match between employers and employees. Improving the allocation of talent can have important consequences for economic growth, as shown in Hsieh et al. (2019).

colleges trying to attract students through misleading changes in their names. Bates (2020) shows that availability of objective benchmarks on the quality of potential hires increases mobility of the most productive workers. In our setting, employers receive signals about college quality: Rivera (2011) finds that educational credentials are the most common criteria used to evaluate resumes. Our paper contributes to this literature by assessing the effects of an improvement or worsening in the reputation of the institution attended, rather than about of a signal of past performance.

Several studies have estimated labor market returns of college attendance in different contexts (see recent examples in Grosz (2020); Montoya et al. (2018); Zimmerman (2014)). Nevertheless, less is known about the role of colleges' reputation. Macleod et al. (2017) shows that college reputation partially substitutes for individual signals, when the latter are unavailable; additionally, reputation appears to be related to earnings growth even when controlling for measures of individual ability. Recent work has focused on reputation in elite institutions, finding that accessing more reputable colleges can increase individuals' income even when they don't appear to improve their graduates' skills (Anelli (2020); Sekhri (2020)).[2]. In contrast to papers that take reputation as fixed, our paper contributes the analysis of the effects of a policy that directly affected colleges' reputation.

Lastly, this paper relates to the literature studying the effects of labor demand shocks at the time of graduation, with most of the work focused on macroeconomic shocks. Kahn (2010) documents the effects of graduating in an economic recession in the early 1980s, finding large and persistent negative labor market effects for white American college graduates. Oreopoulos et al. (2012) finds consistent results using administrative data in Canada. Importantly, this paper is also able to document disparate effects for

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[2]In a recent study, Arteaga (2018) documents that demand for college graduates in an elite college in Colombia decreased following cuts to the university curriculum (i.e. a reduction in courses required for Economics majors), which is consistent with the human capital hypothesis.

more or less advantage students, with the former being better able to switch jobs and cushion the impact. Additionally, Altonji et al. (2016) shows that the effects of a bad economy differ by fields, since higher-skilled majors are less sensitive to negative shocks to the economy. In our paper, we show how market regulation can have short-term effects on recent graduates, even when the policy itself did not targeted them. This can lead to changes in career trajectories and persistent effects.

The next section discusses the relevant institutional context and shows that less advantaged students are more likely to attend lower-quality institutions. Section 3 describes the data used in our analysis. Section 4 presents the empirical strategy, while Section 5 presents preliminary results. Section 6 concludes with a discussion of our next steps.

2   Background

2.1   Higher Education in Peru

Peru, as many other countries in Latin America, went from a closed economy to an open one at the beginning of the 90s. Many of the reforms that came during that decade included market deregulation policies and promotion of the private sector, and some of these reforms were focused on the education sector. With the approval of Law No. 882 in 1996, the Peruvian Congress allowed for-profit universities to enter the market. This increasing number of universities also revealed a pattern: private universities rarely expanding access in unattended regions and predominantly entering markets with already established public universities, as Flor-Toro and Magnaricotte (2021) describe.

In a context where the average income per-capita has grown substantially, access to higher education increased as well over the last two decades. But even when expanding

access is a desirable outcome, there has been concern among policymakers and the public opinion regarding the quality of services that universities have provided (British Council; MINEDU, 2020b; SUNEDU, 2020b). One reason to be concerned about this comes from the low quality of university graduates. For example, Yamada et al. (2013) finds that a reason for this deterioration in the quality of professionals is the lower level of skills of the last generations of students, coming from low-quality universities. This is part of a larger literature documenting the quality differences among higher education options in Peru (Díaz, 2008; Yamada et al., 2015).

As a consequence, in 2012 the Peruvian Congress passed a moratorium on the creation of new universities. This law aimed to limit the entry of universities, especially those of low quality. The moratorium prohibited the creation of both public and private universities and the opening of new branches. Subsequently, already established universities had to pass a licensing process detailed on the next section.

2.2 The Licensing Process

In 2014, the creation of the National Superintendence of Higher University Education (SUNEDU) was made official, based on a major university reform (Law No. 30220). SUNEDU was created to ensure minimum standards in the Peruvian higher education system, through the licensing and supervision of universities. Since January 2015, SUNEDU became in charge of licensing universities that provide higher education service. They are also in charge of verifying compliance with the Basic Quality Conditions [3] and supervising whether public resources and benefits granted through the legal framework are destined for educational purposes and the improvement of educational quality. SUNEDU also assumed the function of managing the National Registry of Degrees and

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[3]A document that compiles a minimum set of standards that universities should comply, they are publicly available here.

Titles, determine infractions and impose sanctions for those institutions who do not comply with the rules established by the Ministry of Education. [4]

For the purpose of the licensing process, SUNEDU collected administrative data for all universities after its creation and started the licensing processing in 2015. During this licensing period, SUNEDU have been producing important information on the quality of institutions in Peru. Clear examples of this are the Biennial Report that contains a ranking of the universities using the data collected through the licensing process, and the licensing results themselves that reduced uncertainties about the educational quality of the licensed universities. With all this information collected and that are publicly available, prospective students can benefit from this information when choosing which college to attend and employers can get information input for the expected productivity of the recent graduates. [5] The licensing decisions were announced starting in 2016, with the last one in January 2021. This resulted in a total of 50 universities out of 144 with a denied license. Non-compliant universities who were denied a license had to close within 2 years. Figure 1 shows the licensing decisions over time. While the distribution of the events for granted licenses seem uniform across time, it is not the same case for denied licenses. This is correlated with the fact that low-quality universities took longer to get the paperwork for the licensing processing.

[INSERT SUBSECTION ON WHO ATTENDS WHAT COLLEGE]

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[4]Other responsibilities include managing the universities name changes, supervise compliance with the minimum requirements for the granting of degrees and degrees of university rank, publish an annual report on the use of the benefits granted to universities, publish a biennial report about the current status of the Peruvian higher education. They are also in charge of administrate statistics of the higher education sector.

[5]The most recent ranking (focused on research) of SUNEDU can be found in the II Biennial Report (SUNEDU (2020a)).

Figure 1: Licensing Decisions over Time
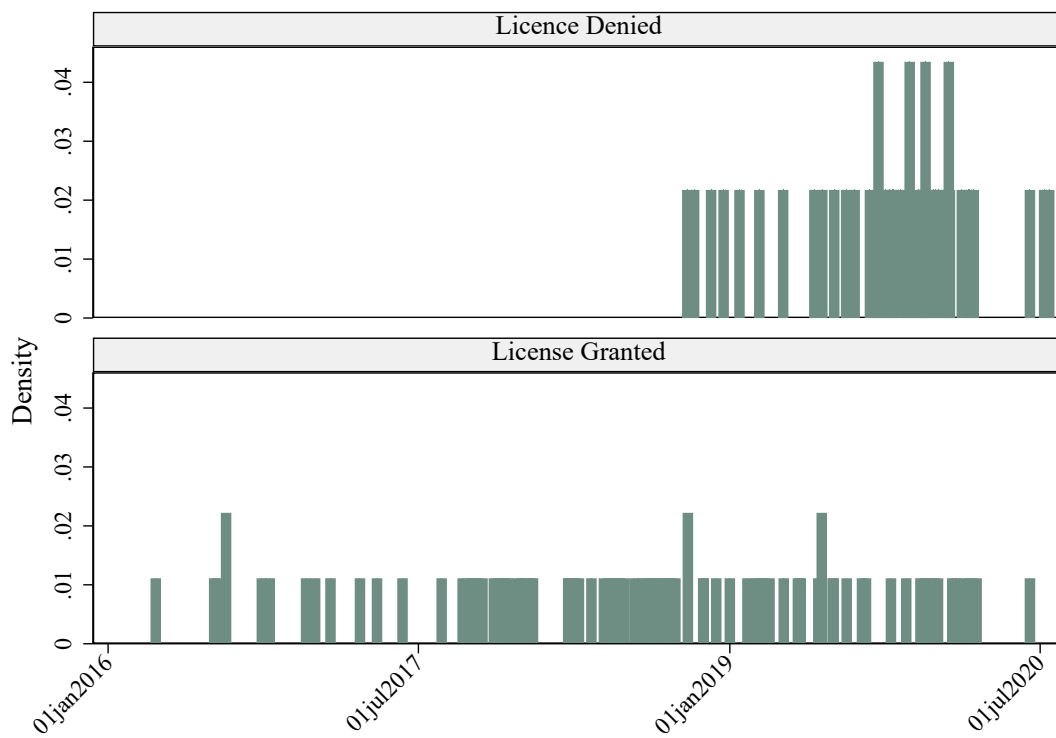
3 Data

In partnership with the Ministry of Education, we matched educational records of recent graduates from multiple sources with their labor market outcomes. Mainly, we use a combination of two large administrative datasets. First, a panel spanning 2014-2019 with monthly formal labor market outcomes for each individual, obtained from the Ministry of Labor. This data comes from the tax records and includes income, number of hours worked, employer identification (anonymized), occupation level and sector. We highlight that this data is from the formal sector, given that Peru has a highly informal labor market, where 5 out of 10 college graduates work in the informal sector.

Second, we have information on educational achievement collected by the Ministry of Education. This data set includes university attended, major, graduation year, level

of degree. In our case, we restrict our attention to bachelor level graduates who born after 1979. In our empirical analysis, we focus on those who graduated withing 1 to 5 years after the licensing decision was made.

[INSERT DESCRIPTIVE STATISTICS TABLE]

For our treatment, we use data obtained directly through the regulator's website about the outcome of the licensing process and its timing. As previously discussed and shown in Figure 1, this provides us with 50 colleges that were closed and 94 that received a license.

4   Empirical Strategy

Our empirical strategy is based on a difference-in-differences (DiD) with multiple time periods and staggered treatment. In our setting, we have two treatments: *Granted* for those universities which obtained a license and *Denied* for those that were denied it. We assume a model of the type:

$$y_{t,c} = \sum_{\tau} \sum_{c'} \beta_{\tau,c'} D\{c' = c\} D\{\tau = t - g(c)\} + \psi_t + \mu_c + e_{t,c}$$

where $g(c)$ is the period in which the licensing decision was announced for college c, and t indexes different months. $\beta_{\tau,c}$ is the parameter of interest: the effect of exposure to the reputation shock on outcome $y_{t,c}$ (e.g. earnings). The term $\beta_{\tau,c}$ highlights the possibility of effects being heterogeneous for different colleges (c) and depending on exposure length $(t - g(c))$.[6] Allowing for heterogeneity and dynamics requires us to avoid standard "two-way fixed effects" (TWFE) regressions, as they have been shown to be problematic in such setups (Goodman-Bacon (2021), Baker et al. (2021)).

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[6]In our setting, heterogeneous treatment effects are likely to arise from heterogeneity in the employers' beliefs update induced by the licensing decision.

The frailties of TWFE come from the inclusion of already-treated groups within the comparison group: if treatment effects are heterogeneous, the TWFE estimator will be biased.[7] Several recent papers have introduced solutions to address these problems, by making sure that only never-treated or not-yet-treated units are included in the comparison group. Similar to the basic difference in differences, these papers rely on parallel trends assumptions to build consistent estimators that do not suffer from the same problems.[8]

We use the estimator proposed in Callaway and Sant'Anna (2020) and provide estimates using only not-yet-treated units.[9] This estimator is robust to dynamic effects (e.g. increasing with length of exposure to treatment) and effects being heterogeneous across colleges.

Because we have two different treatments, we estimate two separate models. Additionally, only colleges that will eventually receive a license are used as comparison group for the *Granted* treatment; we build the comparison group for the *Denied* treatment correspondingly. $y_{t,c}$ will be earnings, employment, and other labor market outcomes depending on the specification.

5   Preliminary Results

5.1   Positive Reputation Signals: License Granted Results

First, we estimate our model for the group of recent college graduates who attended a college that received a license. Figure 2a displays the results of a positive signal on

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[7]Dynamic effects, e.g. when treatment effect is growing as time from the event passes, also lead to misspecification and inconsistency when a constant effect is assumed. This can be addressed by estimating treatment effects relative to event time (Borusyak et al. (2021)).

[8]See as examples of such new estimators Callaway and Sant'Anna (2020), Borusyak et al. (2021), and Sun and Abraham (2020).

[9]By the end of the period studied, all colleges had received or were denied a license.

wages: after 6 months, we find positive significant effects equivalent to an increase of 20 USD per month, comparable to recent increments on the Peruvian minimum monthly wages. We also find a reduction on the total amount of hours worked in a month, equivalent to 8 hours, as seen on Figure 2c. These two results are consistent with a significant increase in hourly wage after 6 months of the signal shock, conditional on being employed. Surprisingly, in Figure 2b, we see a small, significant decrease in employment. This can potentially be explained by young workers choosing alternatives to work: pursuing further education or becoming entrepreneurs.

Figure 2: Effects of *Granted* treatment on labor market outcomes

(a) Wage

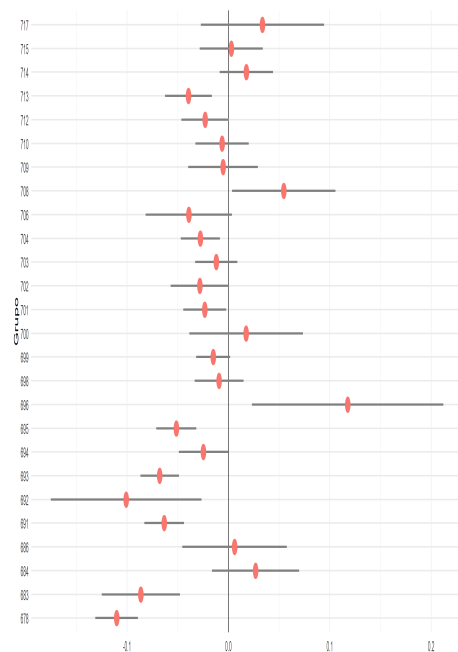(b) Employment

(c) Total Hours

(d) Hourly Wage
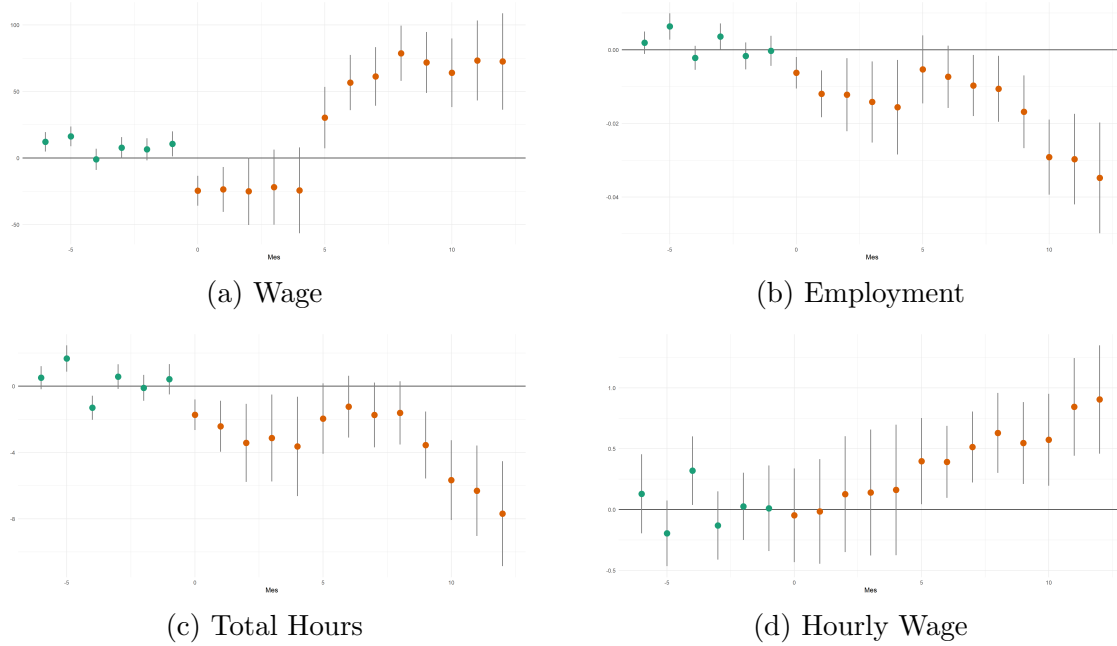
Additionally to estimating effects by length of exposure, we aggregate treatment effects by treatment period. While some treatment periods include only one college, most of them have two or three. Figure 3 shows that the effects seen earlier are driven by the first universities to get the license. This is also correlated with traditional Peruvian top colleges getting the license first. In further analysis, we will include desegregated effects by college quality.
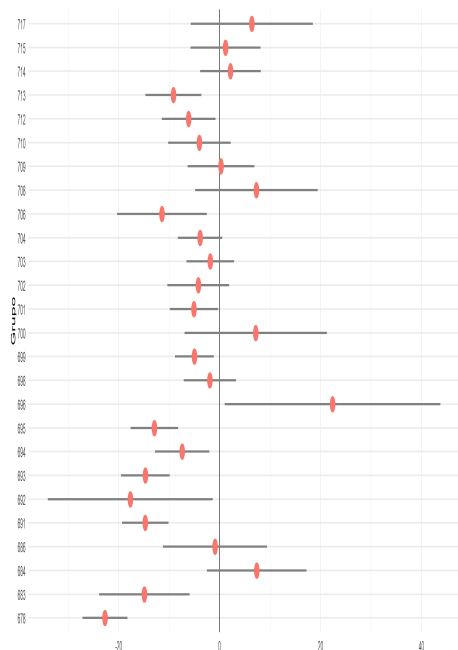
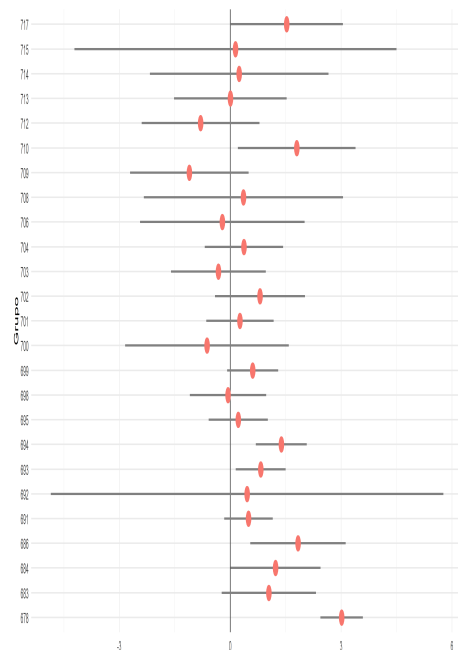Figure 3: Group Time Average Treatment Effects for Granted License College Graduates
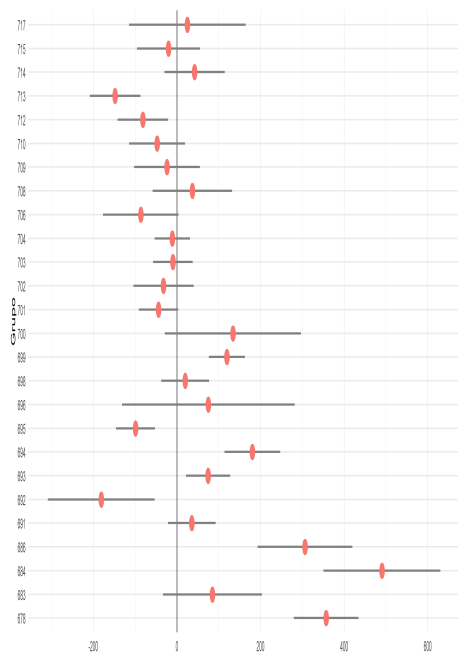
(a) Wage

(b) Employment

(c) Total Hours

(d) Hourly Wage

5.2 Negative Reputation Signals: License Denied Results

Similar to the previous analysis, we estimate our model for the colleges that got their license denied. We do not find any significant results in any outcome as seen on Figure 4, if anything, we see small declines increasing over time. We can see that is similar across groups, as seen on Figure 5. Only one university, group 712 on Figure 5a seems to have significant negative results and this is correlated with this university being the most notorious decision that sparkled protests in Lima.

Figure 4: Effects of *Denied* treatment on labor market outcomes

(a) Wage

(b) Employment
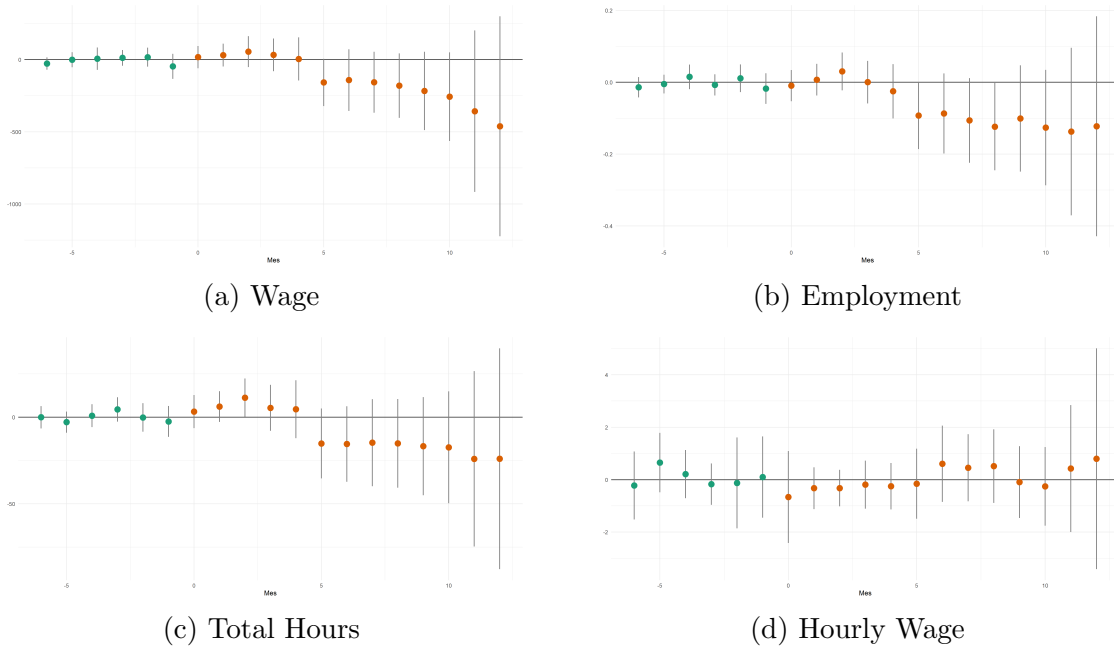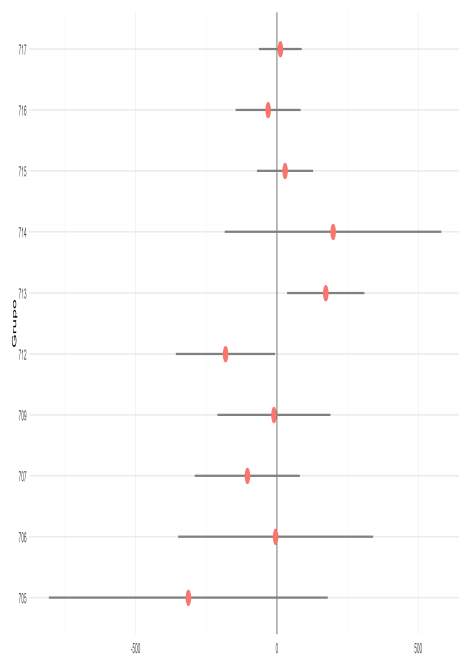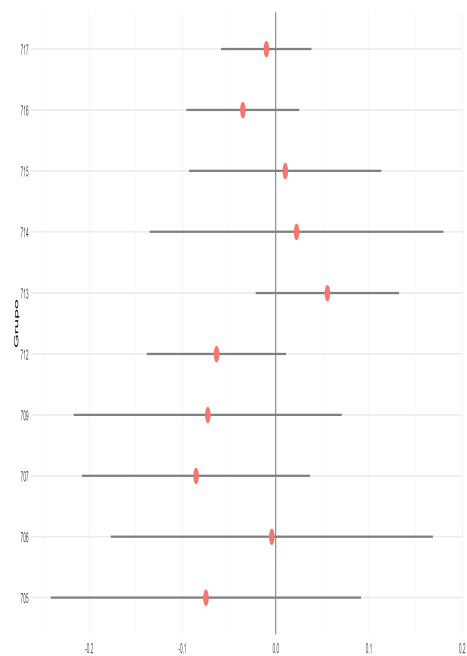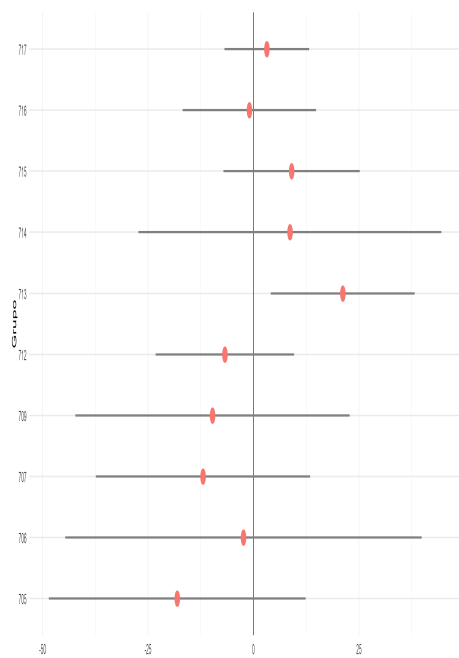

(c) Total Hours

(d) Hourly Wage

Figure 5: Group Time Average Treatment Effects for Denied License College Graduates
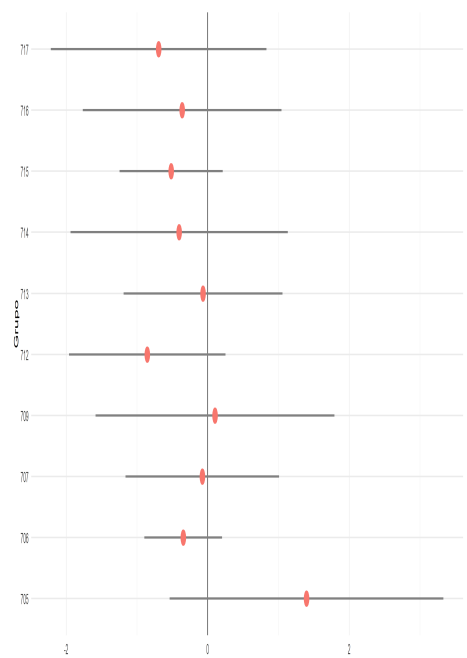

(a) Wage

(b) Employment

(c) Total Hours

(d) Hourly Wage

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6 Discussion and Further Steps

The results presented on this draft will be completed in the upcoming months as we gather and include recent data that has already been obtained: this will allow us to extend the analysis to include the period of December 2019 to December 2020. The lack of this period implies that our current analysis might be under powered: since most of the events happened after 2018, we only have limited data post-treatment for many colleges. Other data sources that we are currently collecting to improve our analysis include informal sector data and credit data.

We also plan to look at treatment effect heterogeneity depending on their prior reputation. We also plan to look at employers (by size), tenure in the job, effects by majors and occupations. Finally, we want to complement this paper by looking at the effects on the informal sector and formal-informal transitions.

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