

IDB WORKING PAPER SERIES N° IDB-WP-1138

The impact of university reputation on employment opportunities:

Experimental evidence from Bolivia.

Ricardo Nogales
Pamela Córdova
Manuel Urquidi

The impact of university reputation on employment opportunities:

Experimental evidence from Bolivia.

Ricardo Nogales¹
Pamela Córdova²
Manuel Urquidi³

¹ University of Oxford

² Universidad Privada Boliviana

³ Inter-American Development Bank

**Cataloging-in-Publication data provided by the
Inter-American Development Bank
Felipe Herrera Library**

Nogales, Ricardo.

The impact of university reputation on employment opportunities: experimental evidence from Bolivia / Ricardo Nogales, Pamela Córdova, Manuel Urquidi.

p. cm. — (IDB Working Paper Series; 1138)

Includes bibliographic references.

1. Universities and colleges-Bolivia-Econometric models. 2. Education, Higher-Bolivia-Econometric models. 3. Employability-Bolivia-Econometric models. I. Córdova, Pamela. II. Urquidi, Manuel. III. Inter-American Development Bank. Labor Markets Division. IV. Title. V. Series.

IDB-WP-1138

<http://www.iadb.org>

Copyright © [2020] Inter-American Development Bank. This work is licensed under a Creative Commons IGO 3.0 Attribution-NonCommercial-NoDerivatives (CC-IGO BY-NC-ND 3.0 IGO) license (<http://creativecommons.org/licenses/by-nc-nd/3.0/igo/legalcode>) and may be reproduced with attribution to the IDB and for any non-commercial purpose, as provided below. No derivative work is allowed.

Any dispute related to the use of the works of the IDB that cannot be settled amicably shall be submitted to arbitration pursuant to the UNCITRAL rules. The use of the IDB's name for any purpose other than for attribution, and the use of IDB's logo shall be subject to a separate written license agreement between the IDB and the user and is not authorized as part of this CC-IGO license.

Following a peer review process, and with previous written consent by the Inter-American Development Bank (IDB), a revised version of this work may also be reproduced in any academic journal, including those indexed by the American Economic Association's EconLit, provided that the IDB is credited and that the author(s) receive no income from the publication. Therefore, the restriction to receive income from such publication shall only extend to the publication's author(s). With regard to such restriction, in case of any inconsistency between the Creative Commons IGO 3.0 Attribution-NonCommercial-NoDerivatives license and these statements, the latter shall prevail.

Note that link provided above includes additional terms and conditions of the license.

The opinions expressed in this publication are those of the authors and do not necessarily reflect the views of the Inter-American Development Bank, its Board of Directors, or the countries they represent.



The impact of university reputation on employment opportunities: Experimental evidence from Bolivia

Abstract:

Access to universities is increasing, particularly in developing countries, which has the potential to improve prospects for employment opportunities and human development. However, the transition mechanisms from university to the workplace are complex due to informational frictions. Recruiters' perceptions and interpretations of applicants' observable educational credentials play a crucial role in labour sort and matching processes. These perceptions are tightly linked to university reputation, which shapes recruiters' expectations of applicants' performance at the workplace, and thus critically affects their choices. We prove this empirically based on a two-branch correspondence experiment in Bolivia. We sent 2'848 fictitious CVs to 1'424 formal firms in the three main urban Bolivian areas applying for an internship and found a large university reputation premium: applicants from well-valued universities from the recruiters' viewpoint are around 40% more likely to receive a positive response – 2.25 percentage points advantage from a 7.87% baseline likelihood. Under these circumstances, a university degree becomes a necessary but insufficient asset for good quality employment.

JEL Codes: I25, J24, C93

Key words: University reputation, employment opportunities, correspondence experiment, Bolivia

1. INTRODUCTION

Increased access to education is unequivocally recognized as a fundamental pillar of human development with justice. Largely, this is due to the role played by education institutions as promoters of employability among their students (Harvey, 2001; Sin and Amaral, 2017; Brown et al., 2003). In an increasingly dynamic economic environment, many policy agendas uniformly emphasize the need for education systems and stakeholders to ‘ensure’ employability and adapt to the fast-changing skill needs in the labour market (OECD, 2016; UN, 2015). Many higher education institutions around the world have followed this political demand by carefully tailoring their academic programs, creating specialized curricula, and ultimately becoming more responsive to potential employers’ requirements (see Speight et al., (2013) for evidence in the UK, Puhakka et al. (2010) in Finland; Bonilla-Mejía et al., (2019) in Colombia; Rodriguez et al., (2016) in Chile; Urquidi et al., (2018) in Bolivia).

Indeed, an increasingly diversified, flexible supply of higher education programs *should* have positive effects, as it may boost employability by virtue of a more efficient process of skill acquisition, attuned to the needs of recruiters (Ferreira et al., 2017). The issue, however, is that the transition from university to the workplace is far from being straightforward. There is a complex nexus between employability, the skill formation process and effective employment (Sin and Amaral, 2017; Krishnakumar and Nogales, 2020). In particular, recruiters’ behaviour play a critical role in determining if and when employability opportunities are transformed into actual employment (Harvey, 2001; McQuaid and Lindsay 2005). As stressed in Di Stasio et al., (2016), Bol (2007) and Brown et al., (2003), it is important to pay attention to the role played by the jobseekers’ ‘relative’ position in the labour queue to understand their true employment opportunities in contexts of rapidly expanding access to education. This ‘positional’ approach to education and skill acquisition posits that employers sort jobseekers according their *signaled* characteristics – including educational credentials.

Thus, recruiters’ *interpretations* of graduates’ educational credentials play a pivotal role in the transition from university to the workplace (Bailly, 2008; Cai, 2013, Harvey, 2001). Recruiters observe the identity of the degree-awarding university, and the way they interpret this information is tightly linked to the university *reputation* (MacLeod and Urquiola, 2015; MacLeod et al., 2017, Camacho et al., 2017). To cope with information asymmetry, recruiters make choices based on their knowledge and experience about applicants’ expected performance. This set of available information to the recruiter is termed ‘system of beliefs’ in Bailly (2008) and Cai (2013), and it is essentially formed of subjective interpretations of the applicant’s educational credentials that are impossible to perfectly measure.

In this paper we ask what is extent to which recruiters’ perceptions about educational credentials play a mediating role in the relation between holding a university degree and having realistic employment opportunities? This question is related to the possible existence of elitist recruitment processes, by which well-

paid, stable jobs are a privilege of job-seekers who are able to signal 'good' educational credentials (Harvey, 2001; Brown et al., 2003; Boden and Nedeva, 2010, McQuaid and Lindsay, 2005). Our question is quantitative in nature, and we acknowledge that any plausible answer is inherently context-dependent. Thus, after formally explaining the general connection between university reputation and employment opportunities, we offer a compelling empirical insight into this issue focussing on Bolivia, one of the poorest countries in South America. The context in Bolivia is particularly suitable for our study, as the proportion of university degree holders among the labour force supply has been steadily growing over the last decade (Martinez et al., 2016; Urquidi et al., 2018), while there is ample empirical evidence showing that such observable educational credentials are hardly relevant factors to explain employability (Lizarraga, 2015; Bassi and Nansamba, 2018). We posit that unobservable factors, such as recruiters' perceptions and university reputation are at the source of this mismatch and determine employability. To the best of our knowledge, this is the first empirical assessment in Bolivia about the role played by unobserved recruiters' behaviour and informational frictions that come along the increasingly heterogeneous labour force. Actually, similar studies are also very scarce in Latin America in general; notable exceptions are only very recent (see MacLeod et al. (2017) and Arteaga (2018) for the case of Colombia, Hastings et al. (2015) for a study about Chile and Brotherhood et al. (2017) for the case of Brazil.

Undertaking this study is challenging for at least two reasons: data unavailability and a relative scarcity of job offers in the Bolivian formal labour market¹. To tackle both issues, we set up a correspondence experiment that consists of sending out e-mails applying for unpaid internships in legally established (i.e. formal) firms, along with a fictitious enclosed CV (Petzold and Moog, 2018). Our choice to send applications for an unpaid internship to gauge employability opportunities finds justification in the empirical evidence supporting a strong positive relationship between internship experiences and overall future career success (Drydakis, 2016; Nunley et al., 2016). Structured internships of a non-exploitative nature are increasingly shown to be an effective 'stairway to employment' (Silva et al., 2016; Sarkar et al., 2016). Importantly, note that the assumed career path-improving effect is contingent on the non-exploitative nature of internships and the effective exposure of interns to relevant work-related activities². This justifies the exclusion of *informal* firms in our study: as these firms often lack the status of a formal employer, an internship in informal establishments may not provide a career-path improving experience and may hardly result in a subsequent formal job offer. Thus, drawing inspiration from Suleman (2017), we argue that obtaining an early career internship in a *formal* firm can be interpreted as a first step towards realistic chances of employability in the formal sector.

Thus, nine fictitious CV's were designed and sent out via e-mail, along with an application for an unpaid internship to a pool of 1'454 formal firms located in the three main Bolivian urban areas: La Paz, Cochabamba and Santa Cruz. These CVs were carefully designed to signal candidates with identical age, skills, work

¹ Defining an informal worker as someone who is not affiliated to the pension system, the rate of informality in the Bolivian labour market has remained stagnant around 75% over the last decade (Choque et al., 2011).

² The absence of such positive characteristics of unpaid internships has been documented, for instance, in Xia (2019) in the Chinese internet and electronics industry.

experience, educational level, area of residence and family background. They solely differ by the university identity, thus allowing us to study role of recruiters' interpretations of this information in their decision-making processes. We pay attention to account for the potential confounding role of gender, as it is the only individual characteristic that cannot be identical in our fictitious CVs, posing serious identification threats. To tackle this issue, we set up a specific gender control experimental branch to arrive at clean estimates of the effect of university reputation on the response to candidates.

We find that university reputation premium is large. The average positive response rate for applicants signalling a 'well-valued university' is 1.4 times that of those signalling a 'poorly-valued university' (7.87% compared to 5.62%). The 2.25 percentage point differential is strongly significant, and we show that it is a consistent impact estimation, free of potential confounding effects caused by gender, observed firm characteristics and seasonality.

The document is structured as follows: Section 2 presents a literature review of relevant scholarships. Based on MacLeod et al. (2017), section 3 presents a general framework to formally explain the effect of university reputation on employment opportunities. Section 4 describes some essential aspects of the Bolivian education system and labour market, as well as the experimental procedures in detail. Section 5 presents our main results and findings, and finally, Section 6 presents our concluding remarks.

2. A BRIEF LITERATURE OVERVIEW

Three strands of academic literature are directly relevant for our study. First is the formation of recruiters' expectations and interpretations of applicants' observed characteristics. Second is the relationship between the expected validity of educational credentials and employment opportunities. Third is the methodological strategy that effectively allows for a credible identification of the intended causal links.

Recruiters face an informational problem when they assess applications, and thus act upon their beliefs and perceptions about the signals and information that are made available to them. The university identity conveys information to recruiters about applicants' educational credentials acting as effective signals allowing them to cope with the information asymmetry. As one directly observable trait, university identity often triggers stereotypes and preconceptions about productivity in the recruiters' mind-sets (Bosak et al., 2018). This is one reason why educational institutions are increasingly paying attention to the labour market success of their graduates to boost their reputation amongst recruiters (Riehl et al., 2017). Importantly, several studies stress recruiters' inability to make perfectly objective assessments of an applicant's educational credentials, as they are only partial, imperfect signals of their skill-stocks (Spence, 1973; Arrow, 1973; Phelps, 1972). Along these lines, Bailly (2008) proposed a reinterpretation of Spence's classical theory about education signalling as a dynamic error-and-trial process of learning in which recruiters may have several interpretations of the educational signals conveyed by the applicants. In that sense, Bailly stresses that educational outputs should not be seen as *substances* that are always similarly interpreted,

but rather as *non-substantial* components of a decision environment that may be differently valued according to each recruiter's beliefs.

These ideas strongly suggest avoiding a simplistic viewpoint to assess the role played by a university degree as a signal for recruiters. Hastings et al. (2015) found a highly heterogeneous premium schedule in Chile, varying along different types of college degrees. Those awarded by highly selective programs and institutions are found to imply large labour market returns compared to other degrees. Brotherhood et al., (2017) stress the importance of school quality differential among States in Brazil as drivers of unequal monetary returns in the labour market. While analysing productivity of colleges in Colombia in terms of their contribution to their graduates' learning and future earnings, Rhiel et al. (2017) found that the most highly selective schools, and thus those providing the highest quality education, add the most to their students' earnings in the labour market.

The aforementioned studies mainly rely on *observed* measures of school quality, either through a direct assessment of students' abilities with entrance/exit college exams, or input-related indicators of school quality including expenditure per student or teacher-pupil ratio. Another vein of studies, however, focusses on the role of *perceived* school quality from the recruiter's viewpoint. Deming et al., (2016) conducted a field experiment about the perception of the value of postsecondary degrees in the United States, finding that applicants holding degrees awarded by online for-profit educational institutions have less chances of achieving success in the labour market. MacLeod et al. (2017) also found evidence of perceived school quality premiums in Colombia, showing that school reputation, unlike years of schooling, is highly correlated with the evolution of graduates' labour market earnings. Although MacLeod et al. use entry/exit exams as observed proxies of labour market school reputation, they originally propose a framework in which it is precisely the recruiters' perceived reputation of educational institutions which may be at the origin of labour outcome differences.

One common issue in the aforementioned empirical studies is the application of adequately designed strategies to successfully identify the intended causal relations. One such methodological approach is a field experiment. Two types of field experiment designs are commonly applied for collecting data in labour market studies such as the one that we undertake here. The first is an audit experiment in which pairs of identical auditors, except for the characteristic that is tested as a source of differentials (e.g. educational credentials), engage in a personal interaction with recruiters to generate data. One handicap in this design is that it relies on human interactions to generate information (Bertrand and Duflo, 2017). One can hardly assume that people's behaviour can be controlled to be identical for many obvious reasons. First is the simple fact that the auditors are different individuals and thus will always have several distinctive personal traits that are unobservable prior to their interaction with recruiters. Second, as auditors know that they are part of an experiment, they may tend to react differently according to the evolution of their interaction with their counterparts.

A second type of design that overcomes the aforementioned limitations are correspondence studies, in which fictitious CVs are sent out to recruiters to

generate information about their response, avoiding human interaction. This type of studies has been extensively applied in developed countries, such as the United States (Lavergne and Mullainathan, 2004), Sweden (Carlsson and Rooth, 2008), Germany (Kaas and Manger, 2010), Australia (Booth et al., 2012), France (Duguet and Petit., 2005) and the UK (Drydakis, 2016). There are only a few similar studies carried out in Latin America countries. Bravo et al., (2008) analysed discrimination in Chile associated with names and places of residence. Galarza and Yamada, (2014) studied discrimination in Peru associated with ethnic conditions and domestic standards of physical beauty.

3. THEORETICAL FRAMEWORK

We draw inspiration from MacLeod et al. (2017) to set up the theoretical foundations and causal mechanisms of our study. Originally, MacLeod et al. posit a mechanism relating university reputation to the dynamic evolution of wages, and they operationalised it in a quasi-experimental setting using Colombian data. However, their framework is also useful to assess the university reputation/employability nexus, as it allows to establish clear hypotheses that can be tested in an experimental setting.

Universities build up labour market reputation based on their graduates' performance. Let R_u denote the labour market reputation of university u , which is unoboservable. For a recruiter, R_u is a noisy group-measure of the work-relevant skills possessed by any graduate of university u . If one denotes applicant's i stock of work-relevant skills as θ_i , then:

$$R_u = \theta_i + \xi_i \quad (1)$$

where $\xi_i \sim N(0, \sigma_\xi)$ represents the noise embedded in university reputation as a signal of an applicant's skills. Thus R_u is the expected skill-stock of a random university u graduate:

$$R_u = E[\theta_i | i \in u] \quad (2)$$

Assuming that skills are normally distributed among applicants, then the university's reputation represents the mean of their graduates' skill distribution:

$$\theta_i \sim N(R_u, 1/\rho_\theta) \quad (3)$$

where $\rho_\theta \equiv 1/\sigma_\theta$ denotes the precision of the university's labour market reputation as a signal of its graduates' skills.

This setting implies a crucial role of the information in the applicant's CV. Alongside the university identity, the CV provides a vital set of information for recruiters to make hiring decisions. It includes the applicant's gender, their family and ethnic background, their work-experience, hints of their socioeconomic

position and many other personal characteristics. In this setting, once the CVs are sent out, the applicant's success is entirely in hands of recruiters and the way in which they *interpret* the signals they are given in the CVs. This clearly evokes the importance of Bailly's (2008) systems of beliefs in a setting of informational frictions induced by noisy signalling.

Let us denote the information set conveyed in applicant's i CV as I_i , which has a finite overall precision, ρ_I , as a signal of work-relevant abilities for the recruiter. This set includes the university identity, which must not be confounded with the university's labour market reputation (MacLeod et al. 2017). The former is an observed factor, but the latter is an unobserved element resulting from the interpretation of the university's identity by the recruiter (Cai, 2013; Bailly, 2008).

Let us now denote as y_i any labour outcome for applicant i . In our study, the outcome of interest is receiving a call-back, which is a noisy reflection of the recruiters expected work-relevant skill stock, given the information included in the CV:

$$y_i = E[\theta_i|I_i] + \epsilon_i \quad (4)$$

where $\epsilon_i \sim N(0, \sigma_\epsilon)$ represents all other non-considered random factors affecting the outcome.

Assuming normality for all variables, it is possible to use Bayes' rule to express the latter equation of labour outcome formation as:

$$y_i = \pi_R R_u + \pi_I I_i + \epsilon_i \quad (5)$$

where $\pi_R \equiv \frac{\rho_R}{\rho_R + \rho_I}$ and $\pi_I \equiv \frac{\rho_I}{\rho_R + \rho_I}$. Thus, the outcome is a function of the applicant's university reputation, the overall information included in their CV and other non-considered factors. This means that the unconditionally expected outcome is a function of the applicant's university reputation and other individually-varying signals included in the CV and thus observed by the recruiter:

$$E[y_i] = \pi_R R_u + \pi_I I_i \quad (6)$$

The precision of each element in equation (6) as a signal of the applicant's abilities is directly associated with its importance as a determining factor of the labour market outcome. We rule out the possibility of having $\rho_I = 0$ and $\rho_R = 0$ simultaneously, as this would mean that the outcome is confounded with a random error term, regardless of the CV's content, which is unrealistic. It may be the case, however, that $\rho_R = 0$ while $\rho_I \neq 0$, which would imply the irrelevance of the university's labor market reputation for recruiters' decision-making. Similarly, it may be case that $\rho_R \neq 0$ while $\rho_I = 0$, representing a situation where the

university's labour market reputation completely determines the expected outcome, regardless of any other information embedded in the applicant's CV.

This framework allows us to gauge the extent to which university reputation impacts employment opportunities based on experimental data. To capture the effect of university reputation, let us consider two applicants, i and j , for which we construct identical corresponding information sets I_i and I_j , *except* for the university identity. In this framework, this situation triggers different interpretations of the applicants' CVs by the recruiters that are entirely due to distinct university *reputations*. Let us say that applicants i and j attended universities u and w , respectively. Thus,

$$\Delta_R E[y] \equiv E[y_i] - E[y_j] = \pi_R(R_u - R_w) \quad (7)$$

With experimental data, statistically significant differences in the expected outcomes can only be attributed to differences in the reputation of the applicants' respective universities. Any evidence supporting that $\Delta_R E[y] \neq 0$ can be interpreted as causal evidence of labour market returns to university reputation. We now go on to explain how we set up the correspondence experiment to effectively estimate this impact.

4. EXPERIMENT DESIGN: CONTEXT AND PROCEDURES

As a background for our empirical analysis, let us describe some relevant aspects of the Bolivian education system and labour market. Essentially, all institutions that can legally award nation-wide recognized university degrees are regrouped in two sub-systems: The National Association of Private Universities (NAPU), and the Executive Committee of Bolivian Universities (ECBU) (Martinez et al., 2016). As of 2015, the former regrouped 39 private universities, a number that has nearly doubled in a ten-year span – NAPU regrouped 21 universities in 2003. For more than a decade, ECBU stably regroups all eleven public universities and four special-regime universities holding a direct administrative link with the Ministry of Education. Currently, official measures of education quality are non-existent. ECBU-affiliated institutions have a common quality assessment procedure, while NAPU-affiliated ones have independent, non-uniform evaluation criteria (Martinez et al., 2016). It is thus difficult to build on *objective* criteria to exactly identify 'elite' institutions in this context, which, we argue, makes our study particularly relevant. Overall, both ECBU and NAPU-affiliated institutions possess attributes that may endow their students with potentially equivalent employability opportunity sets. As an example, a similar number of programs offered by both types of institutions are accredited to the permanent mechanism of regional accreditation, ARCSUR, which offers coordinated educational policies for university degrees in countries of the Southern Common Market (Argentina, Bolivia, Brazil, Paraguay and Uruguay, see Solanas, 2019).

In this context, higher education has expanded considerably in the country: the number of newly-enrolled students and that of graduates have respectively increased at annual rates of 2.1% and 2.8% between 2013 and 2016 (Martinez et al., 2016). Meanwhile, employment in the formal sector of the labour market,

has not kept pace with such an expansion of labour supply, which is reflected in decreasing returns to higher education over time. According to Messina and Silva (2019), the market compensation of a university degree compared to completed primary or less has decreased at an annual rate of 7.5 percentage points between 1995 and 2013. This shows that a university degree has become a necessary but insufficient asset for good quality employment. Such a clear distortion of university degrees as markers of educational merit and effective skill signals hints at the possibility of high credentialism in the country (Di Stasio, 2017).

4.1. Experiment Setup

Our experiment covers the urban areas of the three largest Bolivian cities, namely La Paz, Cochabamba and Santa Cruz, which concentrate 76% of the urban population. Our sample frame is composed of all formal firms with register as employers in the Ministry of Labour as of January 2017. We consider 46'095 firms with a valid and publicly known e-mail address, of which we have drawn a random sample of 1'424 firms corresponding to a 2.5% sampling error. The firm sample composition is presented in Table 1.

Table 1: Distribution of the firm sample

	Number of Firms	Frequency
Area		
La Paz	506	36%
Cochabamba	285	20%
Santa Cruz	632	44%
<i>Total</i>	<i>1424</i>	<i>100%</i>
Firm Size*		
Small	631	44%
Medium	528	37%
Large	265	19%
<i>Total</i>	<i>1424</i>	<i>100%</i>
Economic Sector		
Commerce	306	22%
Industry	334	23%
Service	783	55%
<i>Total</i>	<i>1424</i>	<i>100%</i>

Source: Own

Note: *According to the Ministry of Productive Development and Plural Economy, firm size categories are defined based on the number of employees, value of productive assess, net annual revenues and net value of exports. For instance, the number of employees is 10-19 in small firms, 20-49 in medium firms and more than 50 in large firms. For more details, please see Ministerial Resolution MDPyEP/200/2009

Two key elements received attention prior to the execution of the correspondence study. First is the construction of a set of CVs specifically designed for the purpose of this study, and second is the definition of random groups of firms.

The applicants' identities were carefully created to convey *neutral* information except for the university identity. For this, we consider each of the following points, with attention when it comes to gender – which, of course, is the only element in the CV that we cannot set to be neutral:

- The given and last names were chosen to be some of the most common in the country, while also conveying neutral information about key socioeconomic characteristics, including ethnicity and family background³.
- We indicated possession of an undergraduate degree in Business Administration. We justify this choice because it is one of the most highly demanded by employers, it is offered by all ECUB and NAPU institutions, and we argue that it helps us to avoid preference biases towards more specific or specialized professional training (Hahn and Gangeness, 2019). The application message offered assistance in the core administration functional area, which is part of any firm in every sector. No specialization within business administration was signalled to avoid potential firm or sector-dependent skill mismatches (Gupta et al., 2007; Mihail and Kloutsiniotis, 2014).
- A set of skills was selected to adequately fit usual requirements by firms, while conveying abilities that can be considered common among the entry-level working population. The skill profiles were created using data from the World Bank's Survey Towards Employability and Productivity collected in 2012, which is, to the best of our knowledge, the only survey that allows to measure the skills among the working population in the country. These skills include knowledge of accounting and finance, mathematics and statistics, good communication abilities, proficiency in the use of computer and internet browsing, and a basic level of writing and speaking in English as a foreign language.
- We use data from the 2016 Demand Labour Survey collected by IDB to measure recruiters' perceptions about the quality of education in universities located in La Paz, Santa Cruz and Cochabamba (Urquidi et al., 2018). In absence of an official assessment of university quality in the country, we use this information to define a 'well-valued university' as an institution that expands employability opportunities for its graduates in the formal sector as opposed to a 'poorly-valued university'. In a separate analysis for each urban areas, the well-valued university is the one having the highest valuation and is reported to be known by more than 50% of the respondents. In turn, the poorly-valued university is the one having the lowest valuation and is reported to be known by more than 50% of the respondents.
- Based on ample evidence suggesting discrimination against female applicants (Banerjee et al., 2009; Bertrand and Mullainathan, 2004), we assigned male identities to the main experimental branch seeking to maximize response rates. We acknowledge that this introduces identification threats, as we risk confounding the intended university reputation effects with gender-induced effects. To show that our results are not capturing such confounding effects, we consider a third experimental control branch operationalized by the creation of a CV corresponding to a *female* applicant graduated from a well-valued university. We do not consider an identity corresponding to a female

³ The names and last-names were extracted from articles published in two of the country's most read newspapers: El Deber (<https://www.eldeber.com.bo/tendencias/Estos-son-los-10-apellidos-mas-comunes-en-Bolivia-20151110-55269.html>) and Correo del Sur (http://correodelsur.com/ecos/20150927_100-nombres-mas-populares.html).

applicant graduated from a poorly-valued university due to the small sample in our data. We thus safeguard the power of our main experimental branch, while having enough data to confidently rule out gender-induced confounding effects.

Thus, three broad types of fictitious CVs were sent out:

- Type A: Male applicant, graduated from a well-valued university.
- Type B: Male applicant, graduated from a poorly-valued university.
- Type C: Female applicant, graduated from a well-valued university.

Types A and B are used in the main branch of the experiment as they signal male applicants with distinct university identities. Types A and C are the CVs used in the gender-control branch of the experiment. As we mentioned earlier, the university identity was assigned according to the results obtained by area (La Paz, Cochabamba and Santa Cruz), yielding a total of nine fictitious CVs specifically created for this study. Thus, our experiment also controls for regional variations.

Let us now focus on the strategy followed to create groups of randomly selected of firms. Following Bertrand and Duflo (2017), in an adequately designed experimental setting, decisions made by recruiters must take place while simultaneously facing *two* generic types of fictitious CVs. Thus, our strategy consisted of forming random groups of firms in three stages: the first regarding the type of experiment (i.e. whether we are assessing the role of gender or that of university reputation), the second regarding the timeframe for sending out the applications, and the third regarding the order in which the firm received the CVs.

At the first stage, half of the firms (712) received Type A and Type B CVs, and thus their response allows us to gauge the effects of university reputation on the outcome. We refer to this part of the study as the *main experiment branch* in the remainder of the paper. The other half received Type A and Type C CVs to gauge any potential distortion on the outcome caused by our decision of assigning a male identity. Thus, we refer to this part of study as the *gender control branch*.

At the second stage, each of the groups formed in the first stage were randomly divided in two groups (each one composed of 356 firms). In each type of experiment, one of these subgroups received the CVs between January and February 2017, and the other subgroup received them between June and July 2017. These timeframes correspond to recess terms in the Bolivian university system, and thus depict periods in which firms usually expect to receive internship applications. By sending out CVs at two different points in time, we seek to control for potential seasonal confounding effects.

At the third and final stage, each of the subgroups formed at the second stage were randomly divided into two additional groups (each one composed of 178 firms), for which we have inverted the orden in which the CVs were received. Through this procedure, we seek to avoid potential biases caused by any unobserved factor operating while the recruiters take a first glance at the fictitious CVs. In all cases, we made sure that each firm received the second CV within the next 48 hours after they received the first one.

5. RESULTS

Taking the correspondence study as a whole, a total 2'848 CVs were sent out (two to each firm) of which 192 received a positive response. Thus, the overall positive response rate is 6.74%, which is similar to Bertrand and Mullainathan (2004) and slightly lower compared to Galarza and Yamada (2014). Summary statistics of the response rates for both the main experiment branch and the gender control branch are presented in Table 2.

Table 2: Experiment Statistics

Type of CV	Main Branch Experiment			Gender control branch		
	A	B	Total	A	C	Total
Number of CVs sent out	712	712	1424	712	712	1424
Positive responses	56	40	96	46	50	96
Positive response rate	7.87%	5.62%	6.74%	6.46%	7.02%	6.74%
Relative positive response ratio		1.40			0.92	
Differential positive response rate		2.25 pp.			-0.56 pp.	
p-value for null of no significant difference		0.01			0.564	

Source: Own

The set of responses was received up to two months after the emails were sent. Most of them (90%) came by a mobile phone call and the rest (10%) was received via e-mail. We consider a response as positive if it includes an interview offer or if the interview was immediately conducted during the first contact. In every case, we politely declined to move forward with the procedure. We know that a positive response in our setting does not necessarily guarantee a positive result for the application, so our results should be interpreted as an *opportunity* for a positive outcome. We assume that failure to receive a positive response automatically implies the absence of opportunity for a positive outcome (Bertrand and Mullainathan, 2004).

Let us now assess the expected response rates in the main experiment branch as presented in equation (7) to establish the size of university reputation premium. The mean positive response rate for graduates from poorly-valued universities is 5.62% and that of graduates from well-valued ones is 7.87%. The 2.25 percentage points differential in favour of the latter graduates is highly significant. Thus, the response rate for applicants from well-valued universities is 40% higher, depicting a quite large market reputation premium. In other words, a graduate from a well-valued university needs to send out around 13 applications and expect one positive response in return. A graduate from a poorly-valued university needs to send out nearly 18 applications to expect the same result.

To the best of our knowledge, this is the first empirical proof that may be related to perceived *quality* of educational credentials as a key determinant of opportunities to enter the formal sector of the Bolivian labour market. In that sense, our results complement a host of studies showing that *quantity* of education – regularly measured by years of schooling – has very limited

explanatory power of labour market outcome differentials (Lizarraga, 2015; Bagolle et al., 2019; Urquidi et al., 2018). Our results prove that educational credentials are, indeed, highly heterogeneous from the recruiters' viewpoint. This triggers information frictions that affect people's opportunities at the workplace. In this light, an increase of higher education enrolment rates is insufficient to promote an increase of employability in the country over time, nor to realistically improve many people's chances for a quality formal job.

The increasing diversity of degrees in Bolivia does not have the positive effect on employability argued in Ferreyra et al. (2017), as it does not seem to promote a better alignment between labour supply and the needs from the demand-side. There is evidence of a similar situation in Colombia, where educational credentials became increasingly noisy signals for recruiters due to an important and disordered increase of college programs to cope with the rapid expansion of the demand for educational services (Camacho et al., 2017).

Considering the gender-control branch outcomes, we can affirm that our results are not capturing any gender-related confounding effects (see Table 2). Actually, the female applicant received slightly more positive responses compared to the male applicant (50 compared to 46). However, this response gap is not found to be significant.

Even though this branch of our experiment is only auxiliary, we argue that it has a useful interpretation in itself: chances of a positive response arrive at a similar rate for both male and female applicants, insofar as they have good educational credentials, according to the recruiters' beliefs. Recent empirical evidence, coming mostly from developed countries (Bertrand and Duflo, 2017) and a handful of developing countries (Zhou et al., 2013), show that discrimination against women at the call-back stage of experiments similar to ours is much less clear than other types of discrimination. We postulate two plausible explanations for this result. First, from a methodological viewpoint, the similar response rates to men and women may be related to the Business Administration degree included in the CVs, which does not relate to a particularly male-dominated profession. Also, this finding may be the reflection of the steady inclusion of women in the tertiary education system (Urquidi et al., 2018).

5.1 Additional Validity Checks

To provide evidence of the internal validity of our results, we undertake a set of model-based assessments of our data. We show that our results are robust to the inclusion of observed firm characteristics as additional controls. This implies that our results come from an adequately balanced experimental procedure. We show this while also considering the non-linearity of the latent variables underlying outcomes in both experimental branches, which are binary.

We estimated a set of probit models where the dependent variable, denoted as y_{ij}^b , is the response given by firm i to CV j in experiment branch b , which can either be the main branch or the gender control branch. If the response is positive, then $y_{ij}^b = 1$; otherwise, $y_{ij}^b = 0$. We estimated two variants of this model for each type of CV. The first variant includes an intercept and the observed firm

characteristics available in our data, namely area, economic sector, and size as right-hand side predictors. The second variant only includes an intercept. By definition, the predicted probability of having $y_{ij}^b = 1$ in the second variant exactly corresponds to the response rates presented in Table (2). The probit models estimation results are presented in Table (3).

Table 3: Estimation results

Dependent Variable: Model:	Pr(Positive response to CV type A)		Pr(Positive response to CV type B)		Pr(Positive response to CV type C)	
	(a)	(b)	(c)	(d)	(e)	(f)
Intercept	-1.414*** [-1.509,-1.319]	-1.455*** [-1.685,-1.226]	-1.588*** [-1.693,-1.482]	-1.503*** [-1.749,-1.258]	-1.474*** [-1.573,-1.376]	-1.296*** [-1.528,-1.064]
Area						
La Paz (ref.)						
Cochabamba		0.076 [-0.183,0.334]		0.294 [0.024,0.564]		0.028 [-0.245,0.301]
Santa Cruz		-0.088 [-0.315,0.139]		-0.263 [-0.532,0.005]		-0.187 [-0.428,0.054]
Economic Sector						
Services (ref.)						
Commerce		-0.178 [-0.465,0.110]		-0.256 [-0.578,0.066]		-0.311 [-0.613,-0.009]
Industry		0.297 [0.054,0.540]		-0.222 [-0.519,0.074]		0.027 [-0.247,0.301]
Firm Size						
Large (ref.)						
Medium		-0.119 [-0.408,0.170]		-0.12 [-0.449,0.208]		0.019 [-0.266,0.304]
Small		0.089 [-0.146,0.324]		0.138 [-0.119,0.395]		-0.148 [-0.405,0.108]
Pseudo R2	0.000	0.020	0.000	0.037	0.000	0.018
Predicted prob.	7.87%*** [6.47%,9.26%]	8.03%*** [6.62%,9.45%]	5.62%*** [4.42%,6.81%]	5.74%*** [4.53%,6.95%]	7.02%*** [5.70%,8.35%]	7.16%*** [5.79%,8.54%]
Diff. with model (a)			2.25 pp.*** [0.99, 3.50]		0.84 pp. [-1.09,2.77]	

*** p<0.05, * 95% CI in brackets

p<0.01, ** p<0.1

None of the observed firm characteristics is significant to explain the outcomes of the main experiment or the gender control branches. Thus, our results are not driven by these observed potential determining factors of employability. This model-based approach allows us to estimate variations around the average university reputation effect. The differential positive response rate in favour of applicants from well-valued universities ranges from 1 to 3.5 percentage points with 95% confidence. Taking the average positive response rate of these applicants (7.87%), their likelihood of receiving a positive call-back can be as high as 1.44 times that of applicants from poorly-valued universities.

6. CONCLUDING REMARKS

This study is motivated by a well-documented positive relationship between educational expansion and improvement of employability opportunities. However, this relationship seems to be weak in many developing countries. In fact, taking formal posts as a representation of good quality jobs, it is almost non-existent in Bolivia over the recent years. Such a mismatch between increased access to education and realistic chances for employment has contributed to seeing continuously decreasing returns to education overtime (Messina and Silva (2019). Under these circumstances, university degrees seem to be necessary yet insufficient for realistic good quality employment opportunities, which hints at shades of employer credentialism (Di Stasio, 2017). This situation hinders the potential of education massification to foster human development with justice.

Most of the political debate around employability tends to focus on the skill mismatch as a source of frictions in the transition from university to the workplace (UN, 2015; OECD, 2016; Sin and Amaral, 2017). However, drawing inspiration from Bailly (2008) and MacLeod et al., (2017), we proved that recruiters' *perceptions and interpretations* of applicants' observable signals play a crucial role in labour sort and matching processes. As university degrees become more common, unobserved recruiters' behaviour clearly separate successful and unsuccessful candidates in quest of a chance to be employed. Thus, our study is inscribed in scholarship about the role of university *reputation* on labour market outcomes, as we focus on the role of recruiters' interpretation of educational credentials.

Our main empirical finding is that premiums to university reputation are quite large. Applicants from a well-valued university are 40% more likely to receive a positive response compared to applicants showing credentials from a poorly-valued university – a 2.25 percentage point advantage over a baseline likelihood of 7.87%. Perceived degree quality heterogeneity from the recruiters' viewpoint is thus vital to better understand the disconnection between educational advancements, as measured by quantity of education, and actual chances of employment.

There is a long-standing academic literature stressing that the perceived value of educational credentials needs to be seriously taken into account in order to grasp a fuller picture about the transition from university to the workplace (Spence, 1973; Arrow, 1973, Harvey, 2001; Boden and Nedeva, 2010; Bol, 2015). Our study reinforces this idea and stresses that in order to preserve the

potential role played by education massification as effective driver of human development with justice, education policies and reforms must take into account that employers' evaluations of individual attributes going beyond age, ethnicity and sex may result in pervasive social stratification and exacerbated risk of social exclusion. Naturally, this is a very complex issue, but as stressed in Harvey (2001): "some institutions have good graduate employment rates because of their reputation, but that may have more to do with employers' perceptions that the *best* students go [to] the institution rather than perceptions about how well students are developed [at] them" (p.103, own emphasis). Thus, universities may seek to acquire better reputation by increasing the employability prospects of their 'average' student. This gives them reason to be more selective when it comes to selecting students to enter their programs (Brown et al., 2003), which may threaten overall social inclusion. Hence, education across the entire education system (and not only the higher education system) may be at the core of this matter.

We argue that our results about the effect of university reputation in Bolivia are compelling in that they are free of regional, gender and seasonal confounding effects. Of course, we do not wish to imply that gender discrimination is non-existent in the country overall. Rather, we argue that our study lays out some specific possible conditions in which university reputation effects overpower other, most likely very persistent sources of social stratification and discrimination (Choque et al., 2011).

Several veins for future research on the labour market effects of university reputation may arise considering these findings. First, it is important to recognize that studies accounting solely for quantity of education are unable to grasp the true complexity of the connection between education and labour outcomes. We show that this is the case in Bolivia, but it also holds true for many countries in the developing world (Amaral et al., 2018; Peter-Cookey and Janyam, 2017). Based on Harvey (2001), we stress that one aspect that requires further attention is the relationship between the formation of university reputation and the process of school choice by students. In this study, we proved that in some circumstances, university reputation may overpower gender as a determining factor for recruiters' decision-making in the formal sector. We find this result to be valid in the main Bolivian cities when conveying a degree in a gender-neutral profession, namely Business Administration. Determining the extent to which this result holds in different settings would be very informative.

Finally, more and better data is needed to delve deeper into this important matter. Unobserved recruiter behaviour and informational frictions in the transition from university to the workplace must be better understood to design public policies (related to labour and education, for instance) that are genuinely useful for improving people's livelihoods and bringing about human development with justice.

7. REFERENCES

1. Amaral N, Eng N, Ospino C, Pagés C, Rucci G and Williams N (2018). *¿Hasta dónde pueden llevarse tus habilidades?* Inter-American Development Bank, IDB-TN-1501
2. Arrow K (1973). The theory of discrimination. *Discrimination in Labor Markets* 3(10): 3-33.
3. Arteaga C (2018). The effect of human capital on earnings: Evidence from a reform at Colombia's top university. *Journal of Public Economics* (157): 212-225.
4. Bailly F (2008) The Role of Employers' Beliefs in the Evaluation of Educational Output. *Journal of Socio-Economics*, 37(3): 959–968.
5. Bagolle A, Valencia H and Urquidi M (2019). *Brecha de habilidades en Bolivia*. IDB-TN-1624, Inter-American Development Bank.
6. Banerjee A, Bertrand M, Datta S, and Mullainathan, S. (2009). Labor market discrimination in Delhi: Evidence from a field experiment. *Journal of Comparative Economics*, 37(1): 14–27.
7. Bassi V and Nansamba A (2018). *Screening and signaling non-cognitive skills: Experimental evidence from Uganda*. USC-INET Research paper No. 19-08.
8. Bertrand A and Duflo E (2017). Field Experiments on Discrimination. In: Bertrand A and Duflo E (eds) *Handbook of Economic Field Experiments*. North-Holland, pp. 309-393.
9. Bertrand A and Mullainathan S (2004). Are Emily and Greg More Employable Than Lakisha and Jamal? A Field Experiment on Labor Market Discrimination. *American Economic Review*, 94(4): 991–1013.
10. Boden R and Nedeva M (2010). Employing discourse: universities and graduate 'employability'. *Journal of Education Policy*, 25(1), pp.37-54.
11. Bol T (2015). Has education become more positional? Educational expansion and labour market outcomes, 1985–2007. *Acta Sociologica*, 58(2): 105-120.
12. Booth AL, Leigh A and Varganova E. (2012). Does Ethnic Discrimination Vary Across Minority Groups? Evidence from a Field Experiment. *Oxford Bulletin of Economics and Statistics*, 74(4): 547–573.
13. Bonilla-Mejía L, Bottan NL and Ham A, (2019). Information policies and higher education choices experimental evidence from Colombia. *Journal of Behavioral and Experimental Economics*: 83(1).
14. Bosak J, Eagly A, Diekmann A and Sczesny S. (2018). Women and Men of the Past, Present, and Future: Evidence of Dynamic Gender Stereotypes in Ghana. *Journal of Cross-Cultural Psychology*, 49(1): 115-129.
15. Bravo D, Sanhueza C and Urzúa S (2008). *An Experimental Study of Labor Market Discrimination: Gender, Social Class and Neighborhood in Chile*. Rochester, NY: Social Science Research Network
16. Brotherhood LM, Ferreira PC and Santos CAR (2017). *Education quality and returns to schooling: evidence from migrants in Brazil*. Working Paper, Getulio Vargas Foundation
17. Cai Y (2013). Graduate employability: A conceptual framework for understanding employers' perceptions. *Higher Education*, 65(4): 457–469.

18. Camacho, A., Messina, J., & Uribe, J. P. (2017). *The Expansion of Higher Education in Colombia: Bad Students or Bad Programs?* Documento CEDE 2017-13.
19. Carlsson M and Rooth DO (2008). *Is it your foreign name or foreign qualifications?: an experimental study of ethnic discrimination in hiring*. IZA Working Paper Series, 3810.
20. Choque M, Foronda C, Nogales R, Yañez E and Zambrana G (2011). *En busca de oportunidades: Clases medias y movilidad social*. Cuaderno del Futuro 28. Informe sobre Desarrollo Humano. Bolivia: PNUD-Bolivia.
21. Deming D, Yuchtman N, Abulafi A, Goldin C and Katz L (2016). The value of postsecondary credentials in the labor market: An experimental study. *American Economic Review*, 106(3): 778-806.
22. Di Stasio V, Bol T and Van de Werfhorst HG (2016). What makes education positional? Institutions, overeducation and the competition for jobs. *Research in Social Stratification and Mobility*, 43: 53-63.
23. Di Stasio V (2017). Who is ahead in the labor queue? Institutions' and employers' perspective on overeducation, undereducation, and horizontal mismatches. *Sociology of Education*, 90(2): 109-126.
24. Drydakis N. (2016). University Attended and Graduates Labor Market Prospects: A Field Study for Britain. *Economics of Education Review*, 52: 192–208.
25. Duguet E and Petit P (2005). Hiring Discrimination in the French Financial Sector: An Econometric Analysis on Field Experiment Data. *Annales d'Economie et de Statistique*, 78: 79–102.
26. Ferreyra M, Avitabile C, Botero J, Haimovich F and Urzua S, (2017). *At a Crossroads: Higher Education in Latin America and the Caribbean*. The World Bank.
27. Galarza FB and Yamada G. (2014). Labor market discrimination in Lima, Peru: Evidence from a field experiment. *World Development*, 58, 83–94.
28. Gupta PB, Saunders PM and Smith J (2007). Traditional Master of Business Administration (MBA) versus the MBA with specialization: A disconnection between what business schools offer and what employers seek. *Journal of Education For Business*, 82(6): 307-312.
29. Hahn CJ and Gangeness JE (2019). Business, Leadership and Education: A Case for More Business Engagement in Higher Education. *American Journal of Business Education*, 12(1): 19-31.
30. Hastings J, Neilson C and Zimmerman S (2015). *The Effects of Earnings Disclosure on College Enrollment Decisions*. NBER Working Paper 21300.
31. Kaas L and Manger C (2010). Ethnic Discrimination in Germany's Labour Market: A Field Experiment. *German Economic Review*, 13: (47-41).
32. Krishnakumar J and Nogales R (2020). Education, skills and a good job: A multidimensional econometric analysis. *World Development*, 128, 104842
33. Lizarraga K (2015). *Formación para el trabajo en Bolivia: La paradoja de un país extractivo*. Documentos de Trabajo sobre Desarrollo 3/2015, INESAD, Bolivia
34. MacLeod WB, Riehl E, Saavedra JE and Urquiola M. (2017). The big sort: College reputation and labor market outcomes. *The American Economic Journal: Applied Economics*, 9(3): 223-61.
35. MacLeod WB and Urquiola M (2015). Reputation and school competition. *The American Economic Review*, 105(11): 3471-88.

36. McQuaid RW and Lindsay C (2005). The concept of employability. *Urban studies*, 42(2): 197-219.
37. Messina J and Silva J (2019). *Twenty Years of Wage Inequality in Latin America*. The World Bank.
38. Mihail DM and Kloutsiniotis PV (2014). The impact of an MBA on managerial skills and career advancement: The Greek case. *The International Journal of Management Education*, 12(3): 212-222.
39. Nogales R, Córdova P and Urquidi M. (2019). On the relationship between labor market policies and outcomes in Bolivia: A search and matching approach. *Estudios de Economía*, 46(1).
40. Nunley J, Pugh A, Romero N and Seals A (2016). College Major, Internship Experience, and Employment Opportunities: Estimates from a Résumé Audit. *Labour Economics* 38: 37–46.
41. OECD, 2016. *Enhancing Employability. Report prepared for the G20 Employment Working Group*.
<https://www.oecd.org/employment/emp/Enhancing-Employability-G20-Report-2016.pdf>
42. Peter-Cookey MA and Janyam K (2017). Reaping just what is sown: Low-skills and low-productivity of informal economy workers and the skill acquisition process in developing countries. *International Journal of Educational Development*, 56: 11-27.
43. Petzold K and Moog P (2018) What shapes the intention to study abroad? An experimental approach. *Higher Education*, 75(1): 35-54.
44. Phelps ES (1972). The Statistical Theory of Racism and Sexism. *The American Economic Review*, 62(4): 659–661.
45. Puhakka A, Rautopuro J and Tuominen V (2010). Employability and Finnish university graduates. *European Educational Research Journal*, 9(1), 45–55.
46. Riehl E, Saavedra J and Urquiola M (2016). *Learning and Earning: An Approximation to College Value Added in Two Dimensions*. National Bureau of Economic Research Working Paper Series.
47. Rodríguez J, Urzúa S and Reyes, L. (2016). Heterogeneous Economic Returns to Post-Secondary Degrees: Evidence from Chile. *Journal of Human Resources*, 51(2): 416-460.
48. Salto D. (2016). The crucial presence of private higher education in Latin America. *International Higher Education* (87): 24-25.
49. Silva P, Lopes B, Costa M, Seabra D, Melo A, Brito E and Dias G. (2016). Stairway to employment? Internships in higher education. *Higher Education*, 72(6): 703-721.
50. Solanas F (2019). Políticas Públicas, MERCOSUR y Educación Superior: la Mercosurización del Estado acreditador. *Revista Perspectivas de Políticas Públicas*, 8(16): 427-439.
51. Spence M (1973). Job market signaling. *Quarterly Journal of Economics*, 87(3), 355–374.
52. Speight S, Lackovic N and Cooker L (2013). The contested curriculum: Academic learning and employability in higher education. *Tertiary Education and Management*, 19(2), 112–126.
53. Suleman F (2017). The employability skills of higher education graduates: insights into conceptual frameworks and methodological options. *Higher Education* 76: 263-278.

54. UN (2015) *Transforming Our World: The 2030 Agenda for Sustainable Development*, 2nd August 2015. New York: United Nations.
55. Xia B (2019). Precarious labour in waiting: Internships in the Chinese Internet industries. *The Economic and Labour Relations Review*, 30(3), 382–399.