

Gray University Degrees: Experimental Evidence from India

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Abstract – Scams involving university degrees are flourishing in many emerging markets. This paper studies the impact of gray degrees, or bought academic credentials from legitimate universities, on callback rates to job applications using a CV experiment in India. The experiment varied the type of degree (no, gray and authentic) in online applications to entry level jobs that require no university qualification. We find that gray degrees increase callback rates by 42% or 8%-points relative to having no degree. This result indicates that it is highly beneficial in India to have a degree even for low skilled jobs, which in turn may motivate individuals to buy degrees. However, we also document that gray degrees fare worse or at least not better than authentic degrees. Overall, our results suggest that bought degrees can partially compensate for the lack of university degrees. We discuss our findings with respect to the costs of a gray degree and the Indian context.

Keywords: scams, gray degrees, bought academic degrees, CV experiment, India

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1 INTRODUCTION

It is an open secret that academic degrees can be bought in India. Local media have widely reported on this phenomenon with headlines ranging from “Degrees on sale: Jaipur study centers offer bachelor degree to PhD for money” (Kumar et al. 2011) to “Fake degree scam: No sweat, you can get a university degree in 10 days” (Ullas and Prasher 2013), as well as “PhDs, Bachelor's degrees on sale in Punjab” (Chowdhary 2011).

How are degrees bought? To answer this question, we collected qualitative data through a local market review, as well as through interviews with agents and potential buyers. Agents and intermediaries handle (parts of) the process. They advertise their services in local newspapers, the Internet, flyers and railway coaches, often using ambiguous language due the illegality of such services.¹ Most of the advertised degrees originate from privately funded universities and often by means of distance education. Students can obtain degrees within as little as two months without even sitting in exams. However, the market and the offered service packages are very diverse. For instance, one interviewed agent summarized the service as follows:

“We manage her [the student’s] signature much before the exam on the answer sheet [...]. During exam days she can send anybody to sit in the exam. The only requirement is that the person taking the exam needs to be female if the original student is female. She may wish to write something or not. We manage a certificate.” [translated from Bengali by the authors, interview dated 27 July 2016]

Why are degrees bought? In order to find out, we focus on the most straightforward rationale, namely boosting job market success as proxied by callback rates. The underlying assumption is that employers cannot easily differentiate between bought and authentic or more credible credentials. This paper tries to quantify the extent to which this is the case.

The role of university credentials on the job market can be viewed from two well-known theoretical angles (see Groulleau et al. 2008): on the one hand, education is meant to increase human capital and productivity on the job (Becker 1964), on the other hand, education credentials send signals to

¹ One example of an online advertisement can be found in Appendix Figure A1.

employers about unobserved and underlying skills and abilities that are relevant to the job (Spence 1973). In addition, degrees convey “a certain prestige or social status” (see Groulleau et al. 2008; p.680). Clearly, buying degrees is motivated by signaling and status rather than human capital accumulation. The basic empirical question is then: how do employers perceive such signals?

To the best of our knowledge, there has been no quantitative work on bought degrees in India and other developing countries. There is also no reliable data on the functioning, size and extent of the market other than anecdotal evidence. Given the dearth of evidence, the motivation and potential insights of our experiment are straightforward: if bought degrees indeed boost callback rates, this would imply that employers have yet to learn to identify them. And as the bought degree market expands, employers may need to engage into more costly screening of applicants, while universities might need to invest into their reputation and brand.

We focus on degrees bought from institutions that also issue valid and completely legal degrees. In what follows, we therefore refer to these as *gray* degrees. We prefer not to call them *fake* as they are genuine degrees from (perceived) low ranked universities acquired through illegal means.

We examine the value of gray degrees in applications to low skilled, entry-level jobs advertised on online platforms by designing a simple CV experiment. India is an interesting case study to investigate the value of diplomas for job market entry in an emerging market, because while the country’s higher education system is quite affordable (Agarwal 2007), it has been characterized as unready for future challenges (Jayaram 2004).

Preparatory qualitative work informed the design of the experiment. We first identified several universities from which gray degrees could easily be bought and picked three of these. These universities tend to be distant from the local job market and are clearly “odd”; for instance, a simple Google search would reveal that at least one of them was involved in a degree scam. We also searched for comparably low ranked universities that issue strictly authentic degrees. We then performed a CV experiment; similar in procedure to those found in the labor economics literature on discrimination

(Bertrand and Mullainathan 2004, Carlsson and Rooth 2007, Correll et al. 2007², Kaas and Manger 2012, Pager et al. 2009). However, the obvious difference to these previous studies is that we are not documenting any form of discrimination due to observable characteristics such as race or gender. With the set-up at hand, we simply test if gray degrees boost callback rates. Overall, this experiment allows us to investigate the value of gray degrees in a natural setting with actual employers.

We picked job advertisements in sectors that required neither specific skill training nor work experience or academic degrees. This is the relevant segment of the job market for our analysis, allowing us to test the impact of gray degrees on callback rates compared to *both* having no degree and authentic degrees (from universities that clearly do not issue gray degrees). In other words, we can examine how gray degrees boost employment chances compared to no degrees, and if they can potentially compete with genuine degrees. In India it is perfectly common that job seekers with university credentials apply to jobs that only require high school degrees due to the competitiveness of the job market³, while high skilled jobs are normally occupied by the applicants from elite and established universities.

More specifically, we sent three CVs to each of the 132 identified job openings, varying the type of degree. To assess the influence of gender, we sent female and male CVs to mixed sector jobs, and only female (male) CVs to female (male) dominated sector jobs. We then recorded callback rates for interviews.

Our results are perhaps not surprising, but they are alarming: CVs featuring a gray degree receive 8%-points more callbacks than those with no degree. This amounts to a 42% increase in the number of callbacks. This difference is significant only for and driven by female applicants and is concentrated in female-dominated sectors. One (partial) explanation for the weaker results for men is that women receive relatively more callbacks regardless of their degree. These gendered patterns may be specific

² In a recent and related follow-up study, the authors of this paper (see Bedi, Majilla and Rieger, 2017) investigate the motherhood penalty along matrilineal and patrilineal fault lines in India using a CV experiment similar to the study by Correll et al. (2007).

³ The Indian media has covered this phenomenon. For instance, “PhD holders apply for SSC's clerical posts in West Bengal” (Times of India, 20 September 2016). Available at: <http://timesofindia.indiatimes.com/city/kolkata/PhD-holders-apply-for-SSCs-clerical-posts-in-West-Bengal/articleshow/54432085.cms> [Accessed 13 July 2017]

to the sampled jobs and Indian context. However, at least qualitatively we see similar patterns for men and women with an advantage of gray degrees compared to no degrees.

It is reassuring that authentic degrees always fare better than gray degrees. The difference in means amounts to 22%-points. This difference is significant among male and female applicants. However, in a heterogeneity analysis we also classified gray degrees into low, medium and high ranked degrees based on the perceived ease of acquiring these degrees according to agents and buyers in qualitative interviews. Also, the lowest rank university has been involved in scams, which is discussed on the Internet. Statistically there are no differences in callback rates between authentic and high ranked gray degrees. This points to the possibility that some gray degrees may compete with authentic degrees. In sum, gray degrees have a moderate and positive effect on callback chances, although they cannot fully compete with authentic degrees. Note that these findings are robust to controlling for sector, firm and CV/profile fixed effects.

We rationalize these results in three ways: First, our findings can be interpreted in the light of education degrees as a signal to overcome information asymmetries about skills of workers (Altonji and Pierret 1998, Harmon and Oosterbeek 2003; see also Akerlof 1970). Our findings imply that gray degrees at least currently send a positive signal to employers when compared to no degrees. It is clear that job market entry even in sectors that require no credentials is easier with a degree on the CV. Simply put: A bought degree is better than no degree at all. Second, authentic degrees send a significantly stronger signal compared to no or gray degrees, as indicated by the highest rate of callbacks. Taken together these findings indicate that, at least in part, the veracity of degrees is verifiable to employers. Third, our findings, especially the gender differences in callback rates can be interpreted with respect to the existence of multiple equilibriums under the presence of noisy signals (Baliga and Sjöström 2004, Bikhchandani et al. 1998, Persico 2002). In many labor market discrimination models (e.g., in Coate and Loury, 1993), employers' prior beliefs of the probability of getting a noisy signal from actually qualified applicants play a crucial role. If the employer has a liberal belief, then she prefers to give a callback after receiving a noisy signal, but conversely, if she has a conservative belief, she is more likely to ignore the CV. Fourth, we can understand our findings in the light of the literature on fake degrees (Attewell and Domina 2011, Brown 2006, Grolleau et al. 2008). In particular, Attewell and Domina (2011) argue that "those who are blocked from attaining degrees through normal means are those most likely to employ false credentials" (p.59). This is backed by what one potential buyer of a gray degree stated during our qualitative interviews:

“I need to take care of my baby, cook, collect water and take care of my parents-in-law... I simply do not have time to study. The duty of a married woman is to take care of her household. If I start studying, who will take care of the household?” [translated from Bengali, interview dated 18 July 2016]

In sum, our results underline that policymakers need to raise awareness among employers about the presence of gray degrees and take measure to limit the expansion of this market. While there is no data on the size of the gray degree market, anecdotal and our qualitative evidence suggest that the market is active. Naturally, our CV experiment cannot gauge to what extent gray degrees boost actual job offers and subsequent earnings. That said, such gray degrees may put honest applicants (with authentic or no degrees on their CVs) at a disadvantage. What is more, employers may hire unqualified and dishonest applicants. If gray credentials spread further in such unregulated markets, firms need to engage into costly learning and screening. In turn, schools granting authentic degrees will need to invest more into their reputation and branding.

The remainder of this paper is structured as follows: Section 2 details some qualitative insights and describes the experiment. Section 3 presents the results. Section 4 discusses the findings and concludes.

2 EMPIRICAL STRATEGY

Our aim was to test the impact of gray degrees on callback rates to job applications relative to authentic degrees and having no degree at all. Based on insights from qualitative data collection efforts, we ran a CV experiment from July to September 2016. We sent 396 applications to 132 job postings. We applied to each of the job postings (or firms) using three generic male or female applicant profiles. For each job posting, the three profiles were arbitrarily distributed to the following three groups: (1) no university degree; (2) gray university degree; (3) authentic university degree.

Qualitative Insights

The empirical strategy was informed by preceding, qualitative interviews. There is little information on the functioning of the gray degree market. So this was a necessary first step for our quantitative analysis. The qualitative data was collected in two steps by the first author of the study: First, we reviewed the local gray degree market and looked for flyers to identify universities from which degrees

could be bought. Second, we did qualitative interviews using snowball sampling with sellers and agents in the gray degree market, as well as with prospective buyers (for details on the ethnographic methodology and results, see Majilla, 2016). More specifically, we gathered advertisements for suspect degrees and approached agents pretending to be prospective buyers. We also interviewed actual and potential buyers and accompanied them to the agents. In total, 5 interviews were done with agents and 23 with potential and actual buyers.

We found that in most cases students contact local agents and those agents forward applications and requests to their contacts at a higher level within the state. Most students do not actually sit in exams. In fact, the degrees are often acquired through the distance education system. If students do need to sit in exams (as in the case of bachelor of law degrees), they just sign the answer sheet and somebody fills in responses for them. Sometimes answers are also provided to them and they copy them onto the exam sheet. We found that students can get undergraduate gray degrees within as little as two months and up to 3 years. However it also important to note that many different business models and service packages exist in this market and one can naturally only get a small glimpse of these during qualitative research.

During the qualitative work we identified several universities from which it was possible to (indirectly) buy gray degrees and out of these we selected three universities that were popular among local agents. It is important to underline that all three universities also offer authentic degrees, earned through actual academic work. These are not fake degrees *per se*. However it is possible to easily access and buy these gray degrees with the help of agents. In these cases student do not write exams and agents take care of the entire process. More specifically, all gray degrees used in our experiment can be accessed through “distance learning.” However the distance learning part is not mentioned on the CVs in the experiment. The chosen degrees cost around INR 18,000-20,000 (~USD 275-300). We would also like to note that the three universities tend to be away from the applicant’s residence and the job market. This is important since the qualitative data indicates that agents tend to collaborate with distant universities. Degrees from such universities should make employers suspicious. It is unlikely that a local applicant obtained a degree from such an *odd* university, given that nearby universities offer similar and (authentic) degrees.

We also ranked these three universities to examine the different shades of gray degrees in the CV experiment. We did this based on the perceptions of agents. The lowest ranked gray degree comes

from a university that easily cooperates with agents and has been involved in scams as documented on websites. It is important to note that costs are roughly similar across the three ranks. All three universities are far away from the study site. For instance, the lowest ranked gray degree comes from a university that is roughly 1500 km away from the home address of our job applicants.

Finally, our aim is not to “name and shame” these particular three universities, so we do not disclose their identities here. Details are of course available on request from the authors for replication and research purposes.

Selection of Authentic Degrees

Recall that we compare CVs featuring gray degrees to both CVs with authentic university degrees and only high school degrees. To this end, we identified some colleges in the state of Bengal offering authentic degrees and we arbitrarily picked three colleges for the experiment. Further, we had to make a choice on the academic discipline itself. Based on insights from the qualitative interviews, we opted for two comparable and relatively less prestigious academic disciplines in the Indian context, namely history and political science. Finally, all CVs featured comparable secondary and high school degrees located near the applicants’ residential address.

Selection of Job Postings

We sent applications to entry level and relatively low-skilled jobs. These jobs do not require a university degree *per se*, and thus provide the ideal setting to test if gray degrees provide a competitive advantage over having no degree at all. More specifically, we picked job postings ranging from sales, in particular insurance or personal loan sales to administrative support, clerical support, call centers as well as medical representatives. We did not design the experiment to be able to detect impacts by specific sectors. Rather, we simply selected and classified jobs into female (N=99), male (N=99) and mixed sector jobs (N=198). We gendered the CV of applicants according to this threefold classification. This allows us to test the differential impact of gray degrees by the gender of the applicant and the gender of the sector. For instance, administrative jobs are typically held by females, while medical sales representatives are mainly male. Conversely, call centers are known to have a mixed work force.

We used three popular online portals in India to search for those jobs. These portals allow applicants to create a profile, upload a resume and apply to job postings. We made sure not to apply to the same

job twice across portals. We also minimized the influence of regional and geographic heterogeneity. We mainly applied to jobs based in Kolkata, and in some cases to jobs in district towns within the state of West Bengal. Related, we excluded job postings from the experiment that required applicants to relocate. Finally, we only selected job postings that were open to both inexperienced and experienced applicants.

Design of Applicant Profiles

We designed the resumes with three considerations on mind: First, we wanted to create realistic applicants for the chosen jobs and sectors. We obtained typical and real resumes from a human resource consultancy. These CVs had Pan-India coverage, had been used in actual applications and were aimed at jobs where no work experience was necessary. Second, we needed to pick names for applicants that suited the Indian context. Discrimination by caste, gender and ethnicities is well researched and documented in the literature (Carlsson and Rooth 2007, Pager et al. 2009). For instance, there is evidence that employers discriminate using the names of job applicants (Banerjee and Knight 1985, Deshpande 2011). To minimize these kinds of sources of statistical noise and competing drivers of callback rates, we selected upper caste Hindu names. Furthermore, in India there is also prejudice and discrimination based on the state of origin. So we used only Bengali names. Finally, in mixed-sex sectors we randomly used male and female names. In the case of female (male) dominated sectors, we only applied with female (male) CVs.

Experimental Procedure and Data Collection

In total we used eighteen CVs: nine male and nine females CVs with three different names and each with three different types of education levels: gray, authentic and no university degree (high-school only). For each job, we sent three resumes. Across jobs we varied the following features in a balanced way: (i) high school name and residential address, (ii) name and gender of applicants (for mixed gender sector jobs).

We recorded callback rates through e-mails and phone calls. Every CV had a unique e-mail and mobile phone number. We did not apply to jobs requiring applicants to directly call or visit the company. Further we used authentic residential addresses for all resumes; however for practical reasons and due

to the fictitious applicants we could not record responses by post.⁴ An applicant's home address may come with labor market discrimination. Bertrand and Mullainathan (2004) found that applicants from dominantly black neighborhoods in the US receive relatively less callbacks than those from white neighborhoods. To minimize such effects, we used residential addresses located in semi-urban areas in West Bengal that are mainly inhabited by Hindus. Sample sizes by degree and gender are summarized in Table 1.

3 RESULTS

Gray degrees significantly increase callback rates compared to having no degree. The impact is moderate in size and stronger among female sector jobs and applicants. In addition, authentic degrees have a much larger, relative impact on callback rates. However we can document important heterogeneous impacts of gray degrees according to their ranking (ranked by the ease of obtaining them). In particular, the positive impact of high ranked gray degrees is not statistically different from the one associated with authentic degrees. In what follows, we first present the main findings graphically, and then investigate the robustness and heterogeneity of the effects in a regression model.

Main Results

Overall, 30% of our applications received a callback. Figure 1 breaks down callback rates by the type of degree. Panel A show a clear hierarchy: CVs with no degree received callbacks in 19.70% of all applications, while those with a gray and authentic degree averaged 28.03% and 41.67%, respectively. The impact of a gray degree on callback rates compared to no degree amounts to 8.33%-points (p-value=0.07, t-statistic=1.82, N=264).⁵ This amounts to a 42% increase. In comparison, the impact of authentic degrees over no degrees is 21.97%-points (p-value=0.00, t-statistic=4.90, N=264). Finally, the difference between gray and authentic degrees amounts to -13.64%-points (p-value=0.00, t-statistic=-3.29, N=264).

We can also differentiate callback rates by degree *and* gender of the applicant (see Panel B, Figure 1). A similar ranking of degrees emerges: CVs with authentic degrees receive more callbacks than those with gray or no degrees. However the differences are stronger among female applicants. Overall,

⁴ In any case, it is unusual for employers to use regular postal services for jobs advertised on online platforms.

⁵ Throughout we present linear regression-based differences in means tests adjusted for clustering at the job posting level.

female receive more callbacks than males (36.36% vs. 23.23%). And the difference in callback rates between female CVs with gray and no degrees amounts to 12.12%-points (p-value=0.09, t-statistic=1.72, N=132). The corresponding difference for male CVs is small in magnitude (4.55%-points) and insignificant (p-value=0.45, t-statistic=0.77, N=132).

Regressions results and heterogeneity

Table 2 summarizes estimates stemming from a linear probability model⁶ where the dependent variable takes on one in the case of a callback and zero otherwise. Standard errors are clustered at the job posting level. Column 1 presents a stripped down model with no covariates. No degree is the excluded category. The impact associated with gray degrees relative to no degree amounts to 8%-points. The corresponding impact of authentic degrees is 22%-points. Column 2 gauges the sensitivity of these marginal effects to the inclusion of a gender dummy, as well as sector and applicant profile/CV⁷ dummies. Point estimates associated with the main variables of interest are extremely stable, confirming that randomization and a balanced sample was achieved in practice. The point estimates associated with gender and the type of sector are insignificant. Columns 3 and 4 show separate results for female and male applicants. Consistent with the previous section and Figure 1, we find that the effect of gray degrees is statistically significant (at the 10% level) and larger among female applicants (12%-points compared to 5%-points). It is also interesting to see that authentic degrees fare consistently better than gray degrees. At the bottom of the table, we report tests of the equality of coefficients between gray and authentic degrees. Differences are statistically significant at conventional levels. Note that our main findings are also robust to the inclusion of firm fixed effects as shown in Appendix Table A1.

Until now we have estimated average effects of gray degrees on callback rates. However, in the experiment, we employed three different *shades* of gray degrees. Based on the qualitative interviews and the subjective evaluation of agents, we could rank order gray degrees. Column 5 shows the results of this heterogeneity analysis. The effects associated with these degrees are all positive. The effect of low and medium ranked degrees is however insignificant and small. Only the effect of the high ranked gray degree is large and significant (at the 10% level). What is more, we find that authentic degrees

⁶ Probit or logit models yield similar results and are available on request.

⁷ These dummies account for effects of the 6 specific CVs (beyond the effects of gender and degree type).

have lost some of their competitive edge over gray degrees. We can no longer statistically differentiate between the effects of authentic vs. high ranked gray degrees (see p-values at the bottom of the table).⁸ Table 3 breaks down callback rates by the rank of degrees, again indicating that effects driven by the higher ranked gray degrees.

4 DISCUSSION AND CONCLUSION

We studied the impact of gray degrees (i.e. bought academic degrees from genuine universities) on callback rates in response to job applications in the entry level sector in India. We designed a CV experiment varying the type of degree (no, gray and authentic) in 396 applications to 132 jobs. We find that gray degrees have a positive impact of 42% or 8%-points on the likelihood of receiving a callback compared to having no degree. Authentic degrees, however, fare significantly better compared to both having no and gray degrees. That said, gray degrees can partially compensate the lack of authentic credentials; and this finding is concentrated among female applicants and female sector jobs. These gender differences may be explained in that callback rates are higher for women in the first place and that women tend to have lower education levels than men and also tend to apply to lower skilled jobs. We also documented an interesting pattern by ranking gray degrees by the ease of obtaining them. Higher ranked gray degrees which are relatively harder to obtain performed (statistically speaking) as well as authentic degrees.

Our results are perhaps alarming rather than surprising. It is clear that employers are at least to some extent misled by gray degrees and receive them as a positive signal. Table 4 breaks down callback rates at the firm level: 13% of firms called back applicants with authentic and gray degrees and ignored applicants with no degree (see column 1). At the same time, 14% of firms only called back applicants with authentic degrees. Conversely, a mere 5% of firms called back applicants with authentic and no degrees, clearly ignoring those with gray degrees. And these patterns are stronger for female CVs (compare columns 2 and 3). These figures indicate that at least some firms can differentiate between gray and authentic degrees.

⁸ Also the difference between authentic and medium ranked degrees in terms of callback rates is insignificant. However the *economic* difference is nevertheless sizeable. So we might be lacking power to test this difference.

Overall our results are in line with our qualitative insights. One agent nicely summarized the economics of gray bachelor of law degrees (LLB):

“Let’s talk about an LLB. You cannot do this on a part time basis. But honestly, tell me, is it worth spending three years doing an LLB unless you go to a good university? We are providing all LLBs at [Rupees] 60,000...If you pay, then you’ll find that your answer script is ready and you just need to sign.” [translated from Bengali, interview dated 12 July, 2016]

But do the benefits of gray degrees really exceed the costs? Our experiment suggests that gray degrees can increase callback rates by 8%-points. The gray degrees in our analysis cost about INR 20,000 (~USD 300), which can be around a fifth of a yearly salary⁹ in an entry level job. But costs vary depending on the degree level, subjects and the extent to which the degree is managed by agents. For example, a LLB degree costs around INR 60,000 (~USD 900) compared to INR 18,000 for a BA in History (~USD 270). That said, the costs of such degrees are actually quite steep compared to the positive impacts on callback rates. Further research should examine the motivations of buyers beyond callback rates, including longer term economic advantages and social motives.

In sum, our results show that policy makers should take measures against bought degrees, as well as inform employers about their existence and identification. An expansion of this gray market could water down the value of authentic degrees. Eventually, gray degrees may negatively affect honest job applicants and lower the overall incentives to obtain authentic degrees.

We would like to point out some limitations of this study: first, we only studied the impact on callback rates. We cannot document if these callbacks translate into getting an offer and keeping a job. Related, we do not have data on wages for holders of different degrees. Second, we focused on a small set of universities from which gray degrees can be obtained. The documented heterogeneities relating to the rank of degrees point to different shades of gray that warrant further investigation. Finally, we focused

⁹ According to our qualitative interviews, a yearly salary in the low skilled sector could be around 8000 to 10000 INR (USD 1500 to 1880). Also note that the unskilled minimum wage in West Bengal is 5962 INR/Month (Government of West Bengal, 2017, available at: <https://www.wbhc.gov.in/sites/default/files/synopsys/01-07-2017/agriculture.pdf> [Accessed 27 August 2017]).

on jobs advertisements that do not require higher education degrees. We do expect a higher scrutiny of CVs for higher ranked jobs that require academic credentials.

Finally, we would like to highlight three avenues for future work: First, it would be interesting to quantify the screening costs for firms in the (expanding) presence of gray degrees. Second, we did not examine welfare effects. It may well be that gray degrees lead to greater welfare if authentic degrees from low ranked universities do not increase the productivity of workers. Third, we found that gray degrees are most helpful for women. It would thus be interesting to assess how gender, as well as taste-based and statistical discrimination interact with having gray degrees on CVs.

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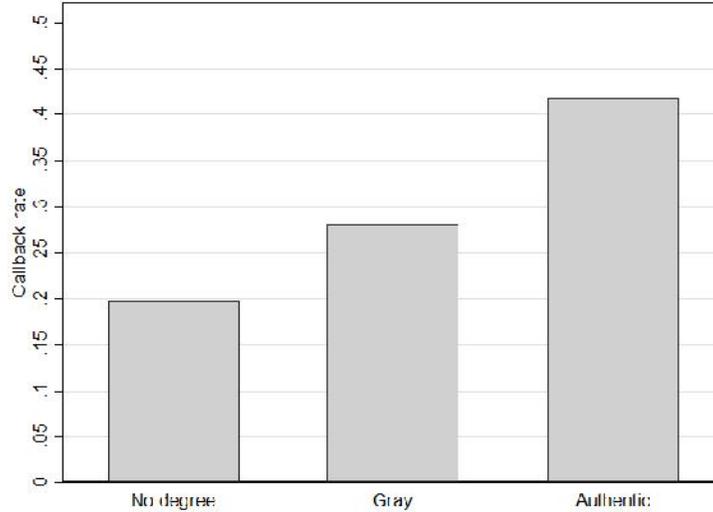
Spence, M. (1973) 'Job Market Signaling', *Quarterly Journal of Economics* 87: 355-374.

Ullas, S.S. and G. Prasher (2013) 'Fake degree scam: No sweat, you can get a university degree in 10 days', *The Times of India* 24 September. Available at: <http://timesofindia.indiatimes.com/city/bengaluru/Fake-degree-scam-No-sweat-you-can-get-a-university-degree-in-10-days/articleshow/22956406.cms> [Accessed 1 March 2017]

6 FIGURES

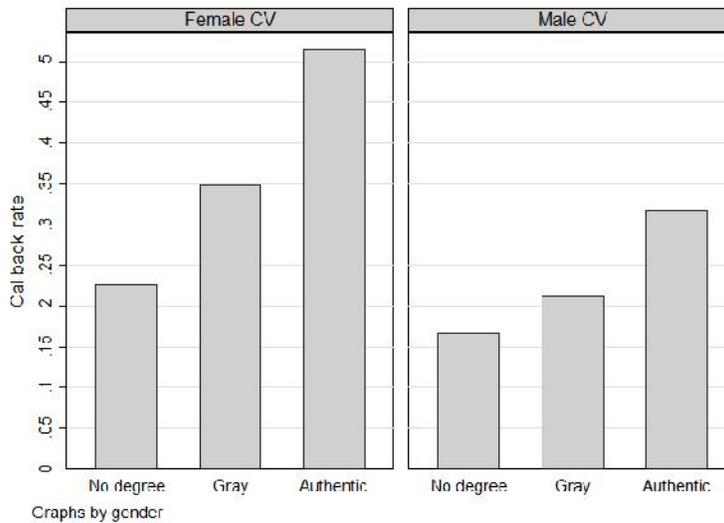
Figure 1: Callback rates by type of university degree

Panel A: Overall callback rates



No vs. Gray degree: p-value=0.07
Gray vs. Authentic degree: p-value=0.00
No vs. Authentic degree: p-value=0.00

Panel B: Callback rates by gender



No vs. Gray degree: p-value=0.09; p-value=0.45
Gray vs. Authentic degree: p-value=0.01; p-value=0.07
No vs. Authentic degree: p-value=0.00; p-value=0.01

Note: N=396 (see Table 1 for a breakdown by degree and gender). P-values stem from pairwise regression-based t-tests adjusted for clustering at the job posting level. *In Panel B*, the first p-value refers to differences in the female and the second p-value to differences in the male sample.

7 TABLES

Table 1: Sample sizes by university degree and gender

<i>University degree</i>	No	Gray	Authentic	Total
Male applicant	66	66	66	198
Female applicant	66	66	66	198
Total applications	132	132	132	396

Table 2: Regression estimates of the effects of types of university degrees on callback rates

Dep. var. Callback	(1)	(2)	(3)	(4)	(5)
<u>Degree type:</u>					
(no degree excl. category)					
Gray	0.08*	0.08*	0.12*	0.05	
	(0.05)	(0.05)	(0.07)	(0.06)	
Gray (low rank)					0.04
					(0.08)
Gray (medium rank)					0.06
					(0.08)
Gray (high rank)					0.15*
					(0.08)
Authentic	0.22***	0.22***	0.29***	0.15***	0.22***
	(0.04)	(0.04)	(0.07)	(0.05)	(0.05)
Female applicant		-0.10			-0.09
		(0.10)			(0.10)
Female sector		-0.06			-0.06
		(0.08)			(0.08)
Male sector		-0.04			-0.04
		(0.09)			(0.09)
Mixed sector			0.04	0.06	
			(0.09)	(0.08)	
Constant	0.20***	0.28***	0.21***	0.14**	0.28***
	(0.03)	(0.07)	(0.07)	(0.06)	(0.07)
Effect equality (p-value)					
<i>Gray=Authentic</i>	0.00	0.00	0.01	0.07	0.01;0.04;0.41
Profile dummies		x			x
Sample of applicants	Total	Total	Female	Male	Total
N	396	396	198	198	396

Note: Linear probability models. Standard errors in brackets under point estimates are clustered at the job posting level. In column 5, we report tests of the equality between effects associated with the three gray degrees (low, high, medium) and the authentic degree. Significance levels are denoted *p<0.1, **p<0.05, ***p<0.01.

Table 3: Callback rates for CVs with gray university degrees by their rank

<i>Gray Degree Rank</i>	(1) Nr. of CVs sent	(2) Callback rates within rank
Low	44	0.23
Middle	44	0.27
High	44	0.34
Total	132	0.28

Notes: This table shows callback rates for CVs with gray degrees by their rank. Column 2 reports the number of callbacks divided by 44 (sample within the given rank).

Table 4: Callback rates at the job posting/firm level

Firm-level response	(1)	(2)	(3)
	Sample		
	Total	Male	Female
No applicant	0.48	0.59	0.38
Only no degree	0.05	0.03	0.06
Only gray degree	0.05	0.06	0.05
Only authentic	0.14	0.11	0.17
Only no degree and gray	0.00	0.00	0.00
Only no degree and authentic	0.05	0.06	0.05
Only gray and authentic	0.13	0.08	0.18
All applicants and degrees	0.10	0.08	0.12
Number of jobs	132	66	66

Notes: This table shows the distribution of callback rates *within* job postings.

8 ONLINE APPENDIX

Figure A1: Example of an online advertisement to buy degrees

The screenshot shows a webpage from Clickindia.com. The header includes the Clickindia logo with the tagline 'Neighbourhood Classifieds', a 'Chennai' location filter, and a search bar with the text 'Enter your keyword'. Below the header is a breadcrumb trail: 'Home » Services » Education Institutions » Universities'. The main heading of the advertisement is '10th 12th can get degree certificate easily - Villivakkam, Chennai'. A price tag indicates 'Price Negotiable'. The text of the advertisement reads: '- 10th 12th can get degree certificate easily by Tharini - Asking price is Negotiable for this Universities'. The main body of the text states: 'We are Offering Diploma, Degree, in all stream in UGC,AICTE,DEC approved State Govt Universities in chennai..... Degree - UG & PG(eg:BA,BCOM,BSC,BCA,BBA ETC..) Diploma - All Streams B.Tech, M.Tech- All Streams M.Phil - All Streams Back dated and Current dated degree can de done!! Online verification is available!! 100% genuine certification,with online verification,postal verification available. NORTH: 1.SHOBIT 2.BUNDLEKHAND 3.SHRIDHAR 4.KANPUR UNIV 5.RAJASTAN UNIV And many more.. SOUTH: 1.SATHYABHAMA UNIVERSITY 2.ALAGAPPA UNIVERSITY 3.THIRUVALLUVAR UNIVERSITY 4.MADURAI KAMARAJAR UNIVERSITY 5.ANNAMALAI UNIVERSITY 6.AIITM 7.KSOU And many more..... Institutions available with certificates attestation for going abroad!! Phd and LLB/LLM also We are Offering in BAR COUNCIL APPROVED University in Regular mode and Fast Track Method in State Government Universities for More Details Call: 78* Dynamik #NO-27'.

Notes: This online advertisement is presented as an example and was not used in the experiment. Contact details were blanked. The original is available at: <http://www.clickindia.com/detail.php?id=136428806> [Accessed 14 July 2017].

Table A1: Robustness to the inclusion of firm/job posting fixed effects

Dep. var. Callback	(1)	(2)
<u>Degree (no degree excl.):</u>		
Gray	0.08* (0.05)	0.08* (0.05)
Authentic	0.22*** (0.04)	0.22*** (0.04)
Constant	0.20*** (0.03)	0.20*** (0.03)
Firm fixed effects		x
N	396	396

Note: Linear probability models. Standard errors in brackets under point estimates are clustered at the job posting level. Column 1 repeats the baseline estimates from Table 2. Significance levels are denoted *p<0.1, **p<0.05, ***p<0.01.