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Job Market Discrimination against Slum Dwellers in Urban Argentina

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Abstract

We conducted a paired correspondence experiment in Buenos Aires, Argentina, to measure the extent of labor market discrimination in hiring against slum dwellers. We sent 4,290 online pairs of fictitious job applications of otherwise observationally equivalent individuals who differed in a single attribute: place of residence, either a slum or not. We found that job applicants living in slums received nearly 28 percent fewer callbacks than other applicants. We observe discrimination across jobs that require a university degree, with discrimination being concentrated in administrative and software-related occupations. We observed discrimination against both men and women living in slums. Discrimination also varied by occupation. Discrimination against slum dwellers is an invisible barrier that affects their employment probability, ultimately reducing their likelihood of graduating from poverty.

Keywords: Correspondence study, Discrimination

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1. Introduction

In this paper, we implement a randomized online correspondence experiment to answer whether labor market discrimination against slum dwellers is a driving force behind their employment outcomes. By answering this question, we are qualifying whether social stigma limits job market opportunities for these individuals and, consequently, whether discrimination is a determinant of poverty we should pay attention to. The question we address is whether for two equally poor individuals employers' discriminatory behavior against slum dwellers makes them less likely to be hired.

We examined the rates of employers' callbacks to pairs of fictitious people who had submitted online job applications in Buenos Aires, Argentina. The application pairs consisted of job seekers who were otherwise observationally equivalent but who differed in one attribute: place of residence, either a slum or not. Because callbacks capture most of the relevant discrimination^[1]¹ and define the first stage of the hiring process, severe discriminatory behavior as manifested in rate of callbacks can conceivably drive suboptimal matching in the labor market and contribute to the poor employment outcomes for slum dwellers.

We found that fictitious slum dwellers of Buenos Aires were, on average, 28 percent less likely to receive a callback than other applicants not living in slums. Among job applicants with university degrees, those living in slums had a 34 percent lower callback rate than other applicants. Women living in slums were 26.6 percent less likely to be called back than other women, a pattern we found was driven by discrimination among highly skilled

¹ David Neumark, Burn and Button (2019) cite a revealing quote from "The Economist" describing the hiring process: *"They [human resource staff] look at a CV for ten seconds and then decide whether or not to continue reading. If they do, they read for another 20 seconds, before deciding again whether to press on, until there is either enough interest to justify an interview or to toss you into the 'no' pile."*

applicants in particular. Men residing in slums had a 29.2 percent lower callback rate than other male applicants. Highly skilled men from slums were the subgroup most discriminated against (registering 39.5 percent fewer callbacks than other comparably qualified male applicants not living in slums).

Correspondence experiments have studied hiring discrimination based on place of residence. These studies compared the rates of callbacks received by job applicants in low- vs. higher-income neighborhoods [2, 3, 4]. Our study adds a layer of “observational equivalency” to previous studies: we go further in matching neighborhoods’ socioeconomic status in each application pair. By documenting whether discrimination in hiring is affected by other factors beyond neighborhood socioeconomic status, we offer a deeper understanding of the determinants of discrimination that is essential for designing actionable policies to deal with its impacts.

Empirical evidence of discrimination in hiring against residents of poor neighborhoods comes primarily from research conducted in industrialized countries. While that evidence could shed light on discrimination in hiring in developing countries, urban dwellers in industrialized countries have almost universal access to essential services (water, electricity, sanitation, and transportation) and the property rights associated with their dwellings are relatively stable. Because it is precisely precarious access to those services and property rights that characterize slums in the developing world, understanding how these characteristics factor in discrimination deserves a dedicated research agenda. We make a modest contribution to that agenda in this paper.

Interventions such as social programs that seek to include slum dwellers in urban labor markets (such as vocational training and social-emotional skills development [5, 6, 7]) and others that indirectly aim at improving employment outcomes of slum dwellers (such as slum upgrading programs [8, 9, 10]) may see their effectiveness limited by discrimination in the hiring process. Accounting for this type of discrimination might be essential to designing interventions that are successful in improving the access of slum dwellers in developing countries to the formal labor market.

We have organized the paper as follows: Section 2 describes the population of slum dwellers in Buenos Aires, Argentina, who are our study population. In Section 3 we explain our correspondence study design and provide details about the data collection activities. Section 4 presents the results along with some analysis of the heterogeneity in the effects by gender, educational attainment, and occupation. Section 5 offers conclusions and policy implications from the study.

2. Background—urban slum dwellers in Buenos Aires

In 2019, there were 340 urban slums in Buenos Aires, Argentina, in which approximately 235,000 people lived.² Residents of Buenos Aires refer to these slums as “villas.” Villas are urban settlements where dwellers have informal property rights, rely on precarious access to city services, and live in crowded housing conditions [11].³ The unequal distribution of urban resources, public goods, and services between residents of villas and those in other areas of Buenos Aires drives the strong contrast between wealth and social deprivation in this city.

In Table 1, we compare some socioeconomic indicators characterizing two groups of working-age people in Buenos Aires, those who reside in villas and those who do not.⁴ The table shows that working-age residents of villas are less engaged in the labor market than other residents of Buenos Aires (there is a difference of 13 percentage points in that metric). Men and women who live in villas are about 6 and 20 percentage points less likely to be in the labor market than men and women who do not live in villas, respectively. Although most workers in Buenos Aires earn salaries, workers residing in villas are

² According to data from the Annual Household Survey of the City of Buenos Aires, the city’s population in 2019 was approximately 3.1 million.

³ The term “villa,” referring to the urban slums or shantytowns of Buenos Aires, is attributed to the journalist Bernardo Verbitsky, who first used it in his 1957 novel *Villa Miseria también en América*.

⁴ For this comparison, we use data from the 2019 Household Survey of the City of Buenos Aires: <https://data.buenosaires.gob.ar/dataset/encuesta-anual-hogares>.

comparatively less likely to work for a wage. When they do, they earn considerably lower wages than workers from the rest of the city.

Table 1 also reveals that differences in schooling could drive the wage gap between the two groups, as workers from villas have on average almost five fewer years of education than workers from the rest of the city. The table also shows that in the villas, compared to elsewhere in Buenos Aires, immigrants (especially from neighboring South American countries) are over-represented as residents: the proportion of immigrants in the villas is more than four times that of immigrants in the rest of the city). As a proxy indicator for poverty, we highlight that those residing in villas are more likely to rely on the public health system for services than other workers. Together, these figures underscore that villa dwellers face more vulnerability than residents of non-villa areas of Buenos Aires [12].

In Appendix A we show that while working-age residents from villas work in a wide range of economic sectors, such as manufacturing, construction, trade, and domestic work, they make up a relatively smaller proportion of the workforce in the financial, professional, administrative, and technical sectors. We conducted focus groups with local recruiters, experts in human resources, academicians, and policy-makers to validate several aspects of the research design. Among other questions, we asked them whether, because many villas dwellers work for a salary in various activities in the formal sector (69 percent of those who are employed earn salaries, and, among them, 37 percent have formal contracts⁵), they use online platforms to find jobs. Participants in the focus groups indicated this is, in fact, the case. This fact bolsters the empirical relevance of our study to the description of the job market in Buenos Aires, as we assume job applications from low-income city residents are often submitted online.

⁵ We proxy for formality in the job contract through whether, as required by law, the employee will be paid an extra amount when fired. Nearly 75 percent of the workers from areas of the city other than villas who work for a wage have formal contracts.

Table 1: Socioeconomic indicators of working-age residents in Buenos Aires: Villas vs. rest of the city

	Villas	Rest of the city
% Labor force participation		
All	70.2	83.2
Female	57.3	77.1
Male	84.7	90.0
% Wage employment (if working)		
All	68.9	77.2
Female	68.5	81.0
Male	69.3	73.6
Wages (median, in Arg. pesos)		
All	8,000	30,000
Female	3,000	25,000
Male	15,000	35,000
Mean years of schooling		
All	9.28	14.18
Female	9.52	14.33
Male	8.99	14.01
% Foreign born	64.2	15.0
% Only uses public health system	70.4	15
Population (ages 24–65)	104,433	1,547,743
Population (total)	235,017	2,836,875

Source: Annual Household Survey of the City of Buenos Aires (2019).

3. Study design and data collection

Our correspondence experiment tested for discrimination by measuring differences in the rates of employers' callbacks to fictitious pairs of online job seekers who submitted applications through web portals. Each application pair consisted of two similarly qualified individuals, with one residing in a villa and the other in similarly poor neighborhood that was not a villa. We replied to 4,290 publicly available online job postings between December 2019 and July 2020 in Buenos Aires. It happened that the timing of our experiment overlapped with the onset of the COVID-19 pandemic. The pandemic affected the quantity and type of jobs available to people: competition among job seekers (new entrants in the labor market and displaced workers) most likely increased and remote work did the same. Consequently, our study speaks to discrimination during a critical transition time in the labor market. Despite those changes, Appendix B shows that the monthly number of jobs for which we submitted applications remained relatively stable during our study.⁶

We selected three areas of Buenos Aires with similar socioeconomic status: two villas (Villa 31 and Villa 21–24) and one low-income neighborhood that is not considered a villa (barrio Monserrat—"barrio" henceforth). Besides the similarities in socioeconomic levels, these communities are relatively equidistant from (and take similar time to get to) the city's downtown (where most economic activity, and jobs occurs). Focus group participants suggested that employers care about distance to jobs just after a threshold: if the applicant lives more than one hour from the job, then it matters. For dwellers of those three areas would not have to travel over one hour to get to jobs within the city limits, we assumed that distance from the place of residence to where the jobs occur would not drive our results. Again using data from the 2019 Household Survey of the City of Buenos Aires, in Table 2 we compare the means of some key variables that characterize working-age

⁶ As we also show in the figure in Appendix B, the average rate of discrimination against slum dwellers converged to a very stable number around 50 days after the government imposed a COVID-induced lockdown in the city of Buenos Aires.

residents in the villas and barrio that we selected for the study.⁷ In the table, the label "Villas" in the title combines residents of Villa 31 and Villa 21-14 and "Barrio" identifies residents of Monserrat. Figure 1 below shows the location of the neighborhoods in the city.⁸

Table 2 shows that, consistent with our design, there are minor differences in income levels between workers living in the villas and those living in the barrio (the gap in monthly household income is 1,605 Argentinian Pesos (APS) from a base of APS 22,700). For those differences to matter in hiring decisions, recruiters should be able to identify a 7 percent difference in income between individuals in the villas and the barrio. To inform whether such differences in poverty are conspicuous enough as to be detected by a recruiter as to affect hiring decisions, we asked in focus groups whether poverty levels (measured by income) were similar between the areas of Buenos Aires selected for the study. Participants in our focus groups considered the three areas to be similarly poor, suggesting those differences in poverty might not drive employment levels for individuals.

Table 2 also shows that villa residents live in slightly more precarious housing conditions and have fewer connections and access to public services than other dwellers. In our data, while nine out of every ten villa dwellers live in a home that lacks a toilet connected to a municipal sewage system, all residents from the barrio are connected to a sewage for water disposal; and while one out of ten villa dwellers live in a home with a roof that is not made of a solid material, all barrio dwellers have homes with solid roofs. In addition, the data reveals that 85 percent of the villa dwellers use public transportation and that value is 94 percent among the barrio dwellers.

⁷ For this analysis we proxied Villa 31 and Villa 21-24, combining all observations in "Villas de Emergencia" in Comunas 1, 2 and 4 of Buenos Aires. Barrio Monserrat was proxied as all low-income residents in areas that are not in villas in Comuna 4 of Buenos Aires. All observations fall within the 25th percentile of the total household income distribution.

⁸ Villa 31 differs from Villa 21-24 in that, in the last ten years, the City of Buenos Aires has implemented infrastructure and social development programs in the former but not in the latter.

Table 2: Socioeconomic indicators of working-age residents: Villas 31 and 21-24 vs. Barrio Monserrat

	Mean in villas ¹	Mean in barrio ²	Difference's significance ³
Income, in ARP (a)	21,092	22,697	***
% Employed	0.59	0.68	***
% Toilet /sewage system (b)	0.89	1	***
% Homes with a solid roof	0.91	1	***
% Use public transportation	0.85	0.94	***
Population (ages 18–65)	39,490	31,264	

Notes: (a) ARP=Argentinian Pesos; (b) Refers to whether the toilet is connected to a municipal sewage system. **Source:** Annual Household Survey of the City of Buenos Aires (2019). **Notes:** (1)The label "Villas" combines residents of Villas 31 and 21-14 and (2) the label "Barrio" denotes residents of Monserrat. Using the Annual Household of the City of Buenos Aires, we proxied Villa 31 and Villa 21-24, combining all observations in "Villas de Emergencia" in Comunas 1, 2 and 4 of Buenos Aires. Barrio Monserrat was proxied as all low-income residents in areas that are not in villas in Comuna 4 of Buenos Aires. All observations fall within the 25th percentile of the total household income distribution. * = 90 percent confidence level, ** = 95 percent confidence level and *** = 99 percent confidence level.

Even though we matched neighborhood poverty levels across the areas selected, small differences in housing and urban conditions of dwellers could eventually matter in hiring decisions. Beyond poverty, those factors could convey a signal to recruiters about differences in workers' productivity. Those differences, as shown in Table 2, appear to be too small as to influence hiring decisions in a correspondence study that, like ours, already matched job applicants on individual level characteristics that predict productivity, and poverty levels (by choosing similarly poor areas). To validate our claim, in Appendix C, we show that the housing and urban variables that we described do not affect differently the employment probability of people living in either the villas or the barrio in our data.

In Buenos Aires, people can distinguish addresses of those residing in villas from addresses of people who live in the formal city. Because city maps did not include villas in their references until 2016 (and still do so inconsistently), slum dwellers created codes for their informal addresses by enumerating block and house numbers. Consequently, employers can identify people who live in villas through their specific type of street address.

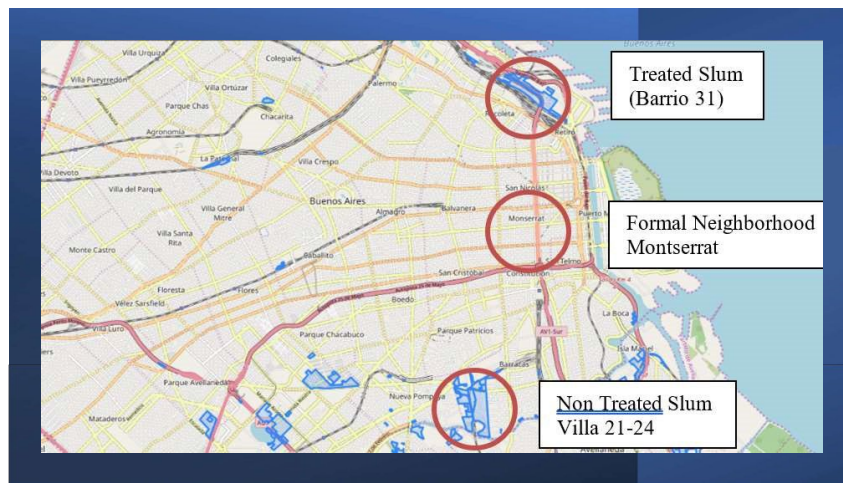


Figure 1: Map of Buenos Aires showing Villa 31, Barrio Monserrat and Villa 21-24.

We carefully created fictitious job seekers from a predefined pool of application pairs to fit each job posting in order to maximize the likelihood of receiving a callback. This was particularly important, because previous studies in Buenos Aires reported low callback rates (for instance, [13] reported a 5.76 callback rate in response to applications sent by email) and furthermore we anticipated that the onset of the COVID-19 pandemic would have increased competition for jobs.

We based the content of each fictitious pair of applications on the analysis of nearly 50 actual resumes of people who resided in Villa 31, and used the pairs to respond to job postings across multiple occupations that demanded

different skills. In our profiles, the information about previous assignments, degrees acquired, and high schools and universities attended mimicked what was listed on those resumes with some editing. All pairs of applications involved individuals of the same gender. In Appendix B we provide further details on how we built the job applicant’s profiles. In each matched pair,

Table 3: Balance table: Key attributes (villa vs. barrio)

	(1)	(2)	(3)	(4)
	Overall	Barrio	Villa	<i>p</i> value (2 - 3)
Job experience in years	7.37	7.60	7.14	0.16
No. of previous jobs	3.92	4.12	3.72	0.09
Additional job training	0.14	0.11	0.17	0.47
Has high school diploma (a)	0.43	0.42	0.44	0.33
Has university degree (a)	0.57	0.58	0.56	0.33

Note: The values in the first two columns are the means of the variables in the rows per group. The third column shows the difference between those means and the asterisks indicate whether that difference is statistically significant at the 95 percent confidence level or lower. (a) Universities and high schools were, either the same, or of similar quality (which we validated in focus groups).

the information conveyed about the job seekers was very similar, with the notable difference that the place of residence of one of the applicants was a slum. Table 3 shows that the critical quantitative attributes in the matched application pairs (or profiles) were balanced. Notably, there are no statistically significant differences in any characteristic at the 95 percent or lower confidence level. We also relied on focus groups to match key qualitative attributes about the applicants, such as the specific high school and the universities they attended and, for those with titles reflecting professional training, the name of the title or of the vocational program completed.

Several correspondence experiments measuring discrimination in hiring in different countries have exploited the fact that recruiters can recognize race, ethnicity and migratory origins through combinations of names and

surnames⁹. In those experimental studies, by randomly assigning names researchers randomize the ethnicity of the applicants. Argentinian surnames also denote migratory origins, and people can tie surnames to either Europe or South American countries [22]. People with European last names are more likely to be native born and to live in the city, whereas people from other South American countries residing in Buenos Aires are more likely to be migrants who live in villas. Because names could bias employers' assessment of skills in favor of applicants of European origin, and, as we noted above, migrants are over-represented in the populations of villas, we matched similar names in each application pair (European to European and migrant to migrant).

To minimize the likelihood that the experiment would be exposed, 6 cell phone numbers, distributed in 3 cell phones, and email accounts for each fictitious applicant were created. A team of research assistants received and kept track of the phone calls, as well as the text messages and emails sent from employers, either inviting the fictitious applicant to an interview or notifying the applicant that they had been selected for the job.

The online job postings were diverse. Some of those requested that job applicants complete a standardized online form, while others directed applicants to upload their CVs or submit them as an attachment to an email. Some online platforms forwarded the job applications to dedicated HR personnel within the firms seeking workers, while others did so to HR firms to which the applicant-screening process had been outsourced.

In our design, besides forcing equivalence in quantitative predictors of worker productivity via the information we revealed in the applications, we also validated qualitatively (in the focus groups) that each matched pair represented applicants with similar productivity [23]. In addition, we reduced potential biases by randomizing the order in which we submitted each application (whether the application from a villa or barrio resident was submitted first), and which applicant we designated as being from a villa within each application pair. As in other correspondence experiments, we attribute the callback differences to recruiters using the information

⁹ Among these are [14, 15, 16, 17, 18, 19, 20, 21]

conveyed in the applications when they were selecting which candidate to call for an interview [24, 25].

We applied to all jobs we encountered during the time frame. Table 4 shows that it resulted in more fictitious job applications from male job seekers than female, and that roughly 60 percent of the applications indicated the candidate had a university degree. The overall response rates were 7 and 5 percent for applications from job seekers living in the barrio and the villas, respectively, and there was variation across occupations (for instance, while “Software-related” occupations averaged a 10 percent callback rate, occupations in the “Others” category averaged a 2 percent callback rate).

Table 4: Callback numbers and rates (overall and by selected categories)

	(1)	(2)	(3)
	Applications	Callbacks	
	submitted	Barrio	Villa
Overall	8,580	291	209
Female	3,638	124	91
Male	4,942	167	118
Has high school diploma	3,669	88	77
Has university degree	4,911	203	132
Software-related ¹	2,486	156	94
Lodging and food ²	1,074	40	39
Administrative (low-skilled) ³	2,218	64	46
Administrative (high-skilled) ⁴	1,952	24	21
Other occupations ⁵	850	7	9

Note: The values in the first column are the numbers of applications and those in columns (2) and (3) are the number of callbacks received by fictitious barrio and villa residents, respectively. We classified occupations as follows: ¹Software-related occupations included programmers, engineers and developers; ²“Lodging and food” jobs included chefs, prep cooks, waiters and waitresses and the like; ³ in the “Administrative (low skills)” category we included

secretaries, administrative assistants and salespersons; ⁴ the "Administrative (high skills)" category included accountants, administrators and HR managers; ⁵ finally, "Other occupations" consisted of nurses, cleaning personnel and security guards/officers.

4. Results

After submitting all the job applications, we measured the callback rate differences between the pairs with different addresses in a regression framework. We modeled the employers' responses as a function of the type of application as follows:

$$Y_{ij} = B_0 + B_1 V_{ij} + z_j + e_{ij}, \quad (1)$$

where the dependent variable Y_{ij} is an indicator with a value of one if the job applicants i associated with the pair of applications with identical attributes except for place of residence j received a callback and zero otherwise. V_{ij} , also an indicator variable, takes the value of one if the job application i from the matched pair j is associated with a job seeker who lives in a villa and zero if the job seeker lives in the barrio. The variable z_j is a vector of fixed effects at the matched pair level that accounts for unobserved heterogeneity across profiles. The e_{ij} vector acknowledges the remaining unobserved heterogeneity.

The B_1 coefficient from Equation 1 is the parameter of interest, henceforth referred to as "Villa effect". We computed that as a coefficient estimate using ordinary least squares (OLS) regressions, where the dependent variable is an indicator with a value of one if a job applicant received a callback and zero otherwise, and the variable of interest is an indicator for whether the applicant lives in a villa or not. We also included a discrete indicator variable for before and after March the 20th, 2020 (when the COVID-19 lockdown started), month and day of the week when the posting appeared online, and an indicator for whether the application was made to a consulting firm to which the hiring process had been outsourced by another firm. All models include the z_j profile fixed effects (as we show in Appendix E, the results do not change by whether we include those sets of covariates). Standard errors are clustered at the job posting level. In Table 4

those estimates denote the percentage point differences in callback rates associated with applicants from villas and the barrio. Negative values indicate that applicants from villas had a lower callback rate than those from barrios.

The column labeled “Barrio mean” shows the callback rates for job applicants who live in the barrio. To contextualize the magnitude of the Villa effect, we present the ratio “Villa effect/Barrio Mean” in the last column of the table, which we interpret as the proportion of callbacks that residents of villas did not receive because employers discriminated against them (the discrimination effect).

In the top horizontal panel of Table 5 we show the overall results. The first row shows the Villa effect coefficient and the “Villa effect/Barrio mean” discrimination effects computed across all the job applications submitted (labeled “Everyone”). We demonstrate heterogeneity in the impacts by educational attainment in the second and third rows, showing those estimates over the subsets of fictitious applications with a university degree and a high school diploma, respectively. In the middle and bottom panels of Table 5 we extend the analysis of heterogeneity in the discrimination coefficients by splitting results by gender.

Table 5 reveals that, overall, the fictitious applicants from villas were 28.1 percent less likely to receive a callback than those from the barrio. Job applicants with addresses referencing villas received 1.9 percentage points fewer callbacks than applicants from the barrio (the difference is statistically significant at the 99 percent confidence level). Discrimination was the highest for the subset of job applicants who had university degrees, as they received 34 percent fewer callbacks than their peers living in the barrio. We did not find evidence that employers distinguish between villa and barrio applicants at the low end of the skills distribution (i.e., between job seekers from villas vs. the barrio).

Fictitious women job seekers living in slums were 26.6 percent less likely to be called back than other women job seekers in the study. The discrimination coefficient was only statistically significant when women were highly skilled (i.e., both applicants had a university degree). Male job applicants living in a villa were 29.2 percent less likely to be called back than those living in the barrio, and in line with the results for women, we only

found evidence of discrimination among men when they had university degrees.

In sum, our main results show that employers discriminate against both men and women from slums in the Buenos Aires labor market. Hiring discrimination appears to be a much more prevalent behavior when employers are choosing among applicants for a high-skills position.¹⁰ The magnitudes of the Villa effect were unaffected by the z_j fixed effects because, within each pair, we had already matched the characteristics of the applicants.

Table 5: Differences in callback rates between job applicants (villas vs. barrio)

	Villa			Barrio		Villa effect /
	effect	SE	N	mean	Barrio mean	
Everyone						
Everyone	-0.019	0.004	8,580	0.068		-0.281
University degree	-0.028	0.006	4,911	0.081		-0.340
High school diploma	-0.008	0.005	3,669	0.049		-0.170
Women						
All women	-0.018	0.006	3,638	0.068		-0.266
University degree	-0.023	0.008	2,220	0.082		-0.275
High school diploma	-0.011	0.008	1,418	0.047		-0.242
Men						
All men	-0.020	0.005	4,942	0.068		-0.292
University degree	-0.032	0.008	2,691	0.080		-0.395
High school diploma	-0.006	0.007	2,251	0.051		-0.127

Note: Values in the "Villa effect" column are coefficient estimates from OLS regressions where the dependent variable is an indicator with a value of one if a job applicant received a callback and zero otherwise. We included a battery of profile fixed effects, a discrete dummy for before and after March 20, 2020 (when the COVID-19 lockdown started), indicators for the month and day of the week when the posting appeared online and an indicator for whether the

¹⁰ Notice that estimates using either probit and logit estimators were very similar.

application was sent to a consulting firm to which the hiring process had been outsourced by another firm. Standard errors are clustered at the job posting level.

4.1. Heterogeneity in discrimination across occupations

Our study offers a representative perspective on discrimination in hiring across a group of occupations. In the same spirit of revealing heterogeneity in discrimination by skill levels of the jobs and by gender, we would like to understand whether discriminatory practices are more prevalent in some occupations than others and whether these patterns differ by gender. Heterogeneity in discrimination by occupation and gender could play a role in determining why some occupations are often regarded as female and others as male dominated, providing actionable information for the targeting of anti-discriminatory policies.

The results that we present in Table 6 show that, even though both men and women who live in villas are called back less often when they apply for jobs in software-related occupations, living in a villa has a more negative premium for men than for women in relation to that sector. The magnitude of the discrimination coefficient in this category for men (52.4 percent fewer callbacks) is more than double that for women (25.7 percent).

In the second horizontal panel in Table 6, we present the discrimination coefficients for lodging and food occupations by gender. Note that, while discrimination in hiring against slum dwellers is prevalent, it does not occur across all categories: employers do discriminate against men living in villas in favor of those who live in the barrio in relation to lodging and food-related positions, but, for this particular sector, employers prefer women living in villas to those living in the barrio.

We find evidence of hiring discrimination against fictitious job applicants who are villa dwellers when they apply for administrative positions that require a low level of skill (irrespective of gender). However, when it comes to administrative positions that require a high level of skill, we found evidence of discrimination against women who live in villas compared to applicants from the barrio, but not against men: fictitious women who lived in villas applying for such positions received 54.5 percent fewer callbacks than women from the barrio.

Table 6: Discrimination effects (by occupation)

	Villa effect	SE	N	Barrio mean	Villa effect / Barrio mean
Software- related¹					
Everyone	-0.050	0.009	2,486	0.126	-0.397
Women	-0.035	0.015	1,096	0.135	-0.257
Men	-0.062	0.012	1,390	0.118	-0.524
Lodging and food²					
Everyone	-0.002	0.013	1,074	0.074	-0.025
Women	0.012	0.015	330	0.055	0.222
Men	-0.008	0.017	744	0.083	-0.097
Admin. (low skills)³					
Everyone	-0.016	0.007	2,218	0.058	-0.281
Women	-0.018	0.010	1,026	0.057	-0.310
Men	-0.015	0.009	1,192	0.059	-0.257
Admin. (high skills)⁴					
Everyone	-0.003	0.006	1,952	0.025	-0.121
Women	-0.012	0.007	966	0.023	-0.545
Men	0.006	0.009	986	0.026	0.244
Other occupations⁵					
Everyone	0.005	0.007	802	0.017	0.286
Women	-0.011	0.012	180	0.011	-1.000
Men	0.010	0.009	622	0.019	0.500

Note: Values in the "Villa effect" column are coefficient estimates from OLS regressions where the dependent variable is an indicator with a value of one if a job applicant received a callback and zero otherwise. We included a battery of profile fixed effects, a discrete dummy for before and after March 20, 2020 (when the COVID-19 lockdown started), indicators for the month and day of the week when the posting appeared online and an indicator for whether the application was sent to a consulting firm to which the hiring process had been outsourced by another firm. Standard errors are clustered at the job posting level.

5. Conclusions

Our research has provided evidence of discrimination against slum dwellers in the job market in Buenos Aires. We find that the level of discrimination is substantial. An applicant residing in a slum experiences a 30 percent lower probability of being called back for a job compared to an applicant with similar qualifications living in a similarly poor but formal neighborhood. This result highlights that the social stigma of a slum can limit the job opportunities of those who live in one.

We find that discriminatory behavior in hiring is more prevalent across occupations that require a higher level of education. Our study submitted applications for jobs requiring high school diplomas and university degrees. We observed that individuals who applied for jobs requiring a university degree had a 34 percent lower probability of being called back if they resided in a slum. Women and men residing in slums were 27 and 39 percent, respectively, less likely to be called back in response to a job application than their matched peers living in a formal neighborhood.

Our estimates by occupation show the discrimination rate, that is, the reduction in the probability of getting a callback, in relation to software-related jobs is 40 percent overall (25 percent for women and 52 percent for men). In relation to administrative occupations, regardless of the skills required, there is also discrimination: women from slums who apply for low-skills positions are called back at a rate that is 31 percent lower than women not from slums experience, and when it comes to high-skills positions, the gap between the rates is even larger: 54 percent. It should be noted, however, that the heterogeneity analysis by occupation showed no discrimination in hiring in relation to some occupations (such as in “lodging and food”).

This study documents and quantifies the magnitude of discrimination in hiring against slum dwellers in cities, and we highlight some of the economic implications related to these findings. First, the type of discrimination that we describe here affects the expected returns to education among individuals who live in slums. As they perceive the constraints on finding a highly skilled job, they may decide not to acquire additional human capital. Such suboptimal investment patterns in human capital will ultimately perpetuate

the poverty cycle. Second, discrimination affects the effectiveness of policy interventions to improve the economic and social inclusion of slum dwellers. For instance, because of discrimination, a program tailored to improve the skills and employability of slums dwellers will have 30 percent lower returns per dollar invested.

Our results also have direct policy implications. First, because 20 percent of the population in Latin American and Caribbean countries lives in slums, it is essential to acknowledge discrimination and measure it to make it visible. As [26] mentioned, some countries have conducted discrimination-monitoring efforts that Latin American countries (such as Argentina) could replicate.¹¹ Policies targeting the “formal city” could help change perceptions about slums dwellers (for instance, by introducing information campaigns that emphasize the employability and skills of that population). Finally, whereas most countries count on regulations against discrimination based on attributes such as gender, sexual orientation or race, there are no active regulatory policies to prevent urban discrimination. As we have shown in this paper, urban discrimination appears to be limiting the job market prospects of slum dwellers.

¹¹ For instance, in 2016 the government of France implemented a correspondence study to monitor patterns of discriminatory hiring practices across large domestic firms and pinpointed those that after being given a period of time to correct such practices did not.

Appendix A. Workers' occupations: villas vs. rest of Buenos Aires

Table A.7: Economic activities of working-age residents in Buenos Aires: Villas vs. rest of the city

	Villas	Rest of the city
Manufacturing	17.50	7.30
Construction	15.80	3.00
Wholesale and retail trade; repair of motor vehicles and motorcycles; accommodation and catering services	27.50	18.60
Transportation and warehousing (including mail and courier services)	5.80	4.40
Financial and insurance activities; real estate activities; professional scientific and technical activities; administrative-technical activities; administrative and support services; information and communication	6.70	25.60
Public administration and defense; compulsory social insurance schemes	1.10	10.70
Education; human health and social services	5.30	17.70
Arts, entertainment and recreation; other services	6.80	7.40
Domestic services	10.50	4.60
Other	3.10	0.70

Source: Annual Household Survey of the City of Buenos Aires (2019).

In Table A.7 we show that working-age residents from villas work in a wide range of economic sectors, such as manufacturing, construction, trade, and domestic work, and are less represented in the financial, professional, administrative, and technical sectors.

Appendix B. Time window of the study

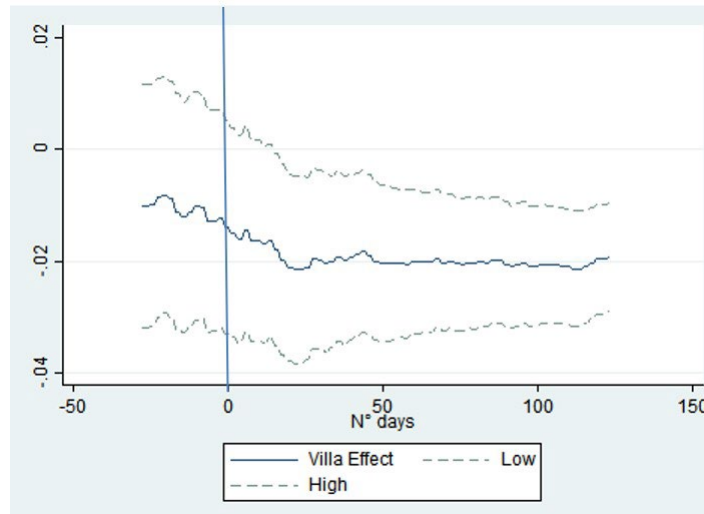


Figure B.2: Map of Buenos Aires showing Villa 31, Monserrat and Villa 21-24.

Following recommendations by the World Health Organization to prevent the spread of the pandemic, the lockdown in Argentina started March 20, 2020, splitting the time window of our study into two periods, with one third of our sample being in the pre-lockdown period and two thirds of the sample in the post-lockdown period. The lockdown led to the closing of restaurants and retail stores and redirected job seekers' priorities toward remote work. The main effect of the lockdown for our study was increased competition for jobs, which impacted callback rates: for barrio inhabitants the rate dropped from 9.7 to 7.3 percent. After the lockdown, we stopped applying for health-related jobs, to avoid placing an extra burden on the health care system.

Table B.8: Job applications per month

Month	Applications	Responses	Response rate
Dec-19	272	18	0.066
Jan-20	1058	65	0.061
Feb-20	858	71	0.083
Mar-20	1212	111	0.092
Apr-20	1368	88	0.064
May-20	1428	47	0.033
Jun-20	1460	70	0.048
Jul-20	924	30	0.032

Figure B.2 shows the dynamics of the “villa effect” coefficient within an interval of 1.96 standard errors during the time of the study. On the x-axis we show the number of days of the study in a normalized time frame where the vertical line at 0 is when the lockdown started. On the y-axis we show the value of the Villa effect coefficients through time. In the graph, the Villa effect is not statistically significant up until approximately 20 days after the start of the lockdown, and after that time the magnitude of those coefficients remained very stable around -0.02.

Appendix C. Validating housing and neighborhood effects

Table C.9: Employment probability by villa residency with and without housing and urban variables

	Model 1	Model 2	Coeff. Diff.
Villa coefficient	-0.0427	-0.0509	-0.008
SE	(0.004)	(0.004)	(0.001)
<u>Covariates</u>			
Age (indicators per years)	YES	YES	
Educational attainment (a)	YES	YES	
Gender	NO	YES	
Has toilet /sewage system (b)	NO	YES	
Home has a solid roof	NO	YES	
Uses public transportation	NO	YES	

Note: Values in the "Villa Coefficient" row are coefficient estimates from OLS regressions where the dependent variable is an indicator with a value of one if a job applicant is employed or not. (a) Educational attainment is a battery of indicators for maximum degree attained. (b) Refers to whether the toilet is connected to a municipal sewage system.

To test the hypothesis that housing and urban attribute do not affect the employment probability of villa and barrio dwellers differently, we estimated the parameters of a regression model of the form:

$$E_i = \alpha_0 + \alpha_1 V_i + Z_1 I_i + Z_2 N_i + U_i \quad (C.1)$$

The variable E_i is an indicator turning one if the individual i is employed and zero otherwise. V_i is another indicator variable turning one if a person lives in a villa and zero otherwise (a "villa coefficient"). I_i is a vector of

individual-level characteristics that predict employment, and N_i is a vector with the three housing and neighborhood conditions in Table 2 ¹².

Using ordinary least squares regressions (OLS) on the same data that we used to produce Table 2, we tested whether the villa coefficient V_i from C.1 differed importantly when we included the N_i vector of housing and neighborhood characteristics. Suppose housing and urban conditions matter for employment beyond neighborhood poverty and individual-level characteristics. There should be essential differences in the magnitudes of the villa coefficients V_i between a regression that controls for the N_i factors and another that does not.

In Table C.9, we show that this is precisely the case: the villa coefficient estimate is not meaningfully affected by the inclusion of covariates proxying housing and urban conditions. The difference between the two mean coefficients is 0.008 percentage points, which we can plausibly suggest is irrelevant for a recruiter to matter when making hiring decisions between villa and barrio dwellers.

¹² Those variables are: indicators for whether the home has a toilet that drains into municipal sewage, the roof of the home is made of solid materials, and household members use public transportation.

Appendix D. Building job applicants' profiles

A database of resumes was created using real resumes in a predefined format. Additional aesthetic elements were modified depending on the job level of the application. Resumes will have three modules: (1) personal information, (2) professional experience, and (3) educational background.

Module 1: personal information Each synthetic applicant was assigned an identity consisting of a name, phone number, and address. The name of the applicants was obtained from the National People Registry. Specifically, to avoid resume individualization, we selected 4 of the 20 most common names in 1990. The table below shows an example of the name and phone numbers assigned. Each profile will keep the same name for every application. In addition to the phone number, each profile had an email address that would be used in all applications. In this way, we ensure a tracking method for call-backs. Therefore, there were four different phone numbers and email addresses, one for each profile, to avoid employers identifying repeated contact information. Resumes did not include photos to avoid biases based on personal appearance.

Synthetic applicants' contact information			
Sex	Place of residence	Name	Phone number
Female	Barrio	Laura Perez	1122385234
Male	Barrio	Matias Ezequiel Fernandez	1164854392
Female	Villa	Florencia Lopez	1164854432
Male	Villa	Juan Ignacio Gonzalez	1139520502

We defined each profile's address based on reference areas for the city of Buenos Aires and internal administrative divisions for the province of Buenos Aires. In the Buenos Aires Metropolitan Area case, we did not implement a

distance between the job site and place of residence criteria since it is a relatively homogeneous district without significant differences in access to transportation that could affect selection. Our focus is on the Autonomous City Buenos Aires as this is where most of the economic activity occurs and to maximize the call-back rates (which would not be influenced by distance from home to work).

Modules 2 and 3: Professional experience and educational background
For the same application, modules 2 and 3 must contain equivalent information such that employers cannot discriminate since skill sets are observable. Additionally, the content in these modules was tailored based on job requirements to maximize employability. For this purpose, we used a bank of secondary and tertiary education institutions and possible professional experience (by job area) and particular aptitudes and skills that can be used regardless of the application. CVs' comparability was assessed in focus groups that included participants who work in labor-related community organizations, academics, and recruiters.

Appendix E. Difference in callback rates between job applicants with no covariates

Table E.10: Differences in callback rates between job applicants (villas vs. barrio)

	Villa			Barrio	Villa effect /
	effect	SE	N	mean	Barrio mean
Everyone					
Everyone	-0.019	0.004	8,580	0.068	-0.281
University degree	-0.026	0.006	4,911	0.081	-0.340
High school diploma	-0.008	0.005	3,669	0.049	-0.170
Women					
All women	-0.018	0.006	3,638	0.068	-0.266
University degree	-0.023	0.008	2,220	0.082	-0.275
High school diploma	-0.011	0.008	1,418	0.047	-0.242
Men					
All men	-0.020	0.005	4,942	0.068	-0.292
University degree	-0.030	0.008	2,691	0.080	-0.395
High school diploma	-0.007	0.007	2,251	0.051	-0.127

Note: Values in the "Villa effect" column are coefficient estimates from OLS regressions where the dependent variable is an indicator with a value of one if a job applicant received a callback and zero otherwise. Here, we did not include any other covariate. Standard errors are clustered at the job posting level.

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