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ABSTRACT

Firm Culture: How Social Norms Affect Gender Bias in Hiring in Online Labor Markets*

Social norms that shape expectations of women's roles within groups can cause gender inequality in employment to persist, even in high information environments. We test this hypothesis using new data from the largest online job platform in Nigeria. We find significant differences in the hiring outcomes of female applicants by hiring manager co-ethnicity. Male applicants that are co-ethnic with the manager are more likely to be hired by firms, while co-ethnic female applicants are less likely to be hired, particularly for senior roles. A field experiment providing information to hiring managers on hiring gender bias dampens the co-ethnic gender effects..

JEL Classification:
J16, J15, J71, J78, L86, O12

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discrimination, employment, ethnic, gender, intersectional, Africa

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1 Introduction

The proliferation of online labor markets like LinkedIn globally has led to increased speculation that the ease of sharing information about job applicants and employers on these platforms may reduce, and eventually eliminate, gender inequality in employment, by reducing mismatch from information frictions in the labor market. However, the literature on the persistence of social norms suggests that, even within environments of high information, gender inequality in employment can persist due to sticky norms, where social norms are defined as informal institutions that dictate appropriate group behavior (Jayachandran, 2020). We investigate these competing narratives, and how social norms can shape gender inequality in hiring in online labor markets using evidence from the largest online job platform in Nigeria[1].

We construct a new dataset from 194,190 unique applicants and over 1.3 million job-applicant matches on the platform between 2016 and 2018. The dataset represents the most comprehensive micro-level dataset on employment in sub-Saharan Africa, where the current number of labor market participants- 600 million- is expected to double by 2050 and quadruple by 2100, at which point the region will comprise 40% of world labor (Archibong and Henry, 2024; Bandiera et al., 2022). Nigeria, as the world's 7th largest labor market, is a focal point of this projected growth in Africa's future workforce (Archibong and Henry, 2024). Nigeria's highly multiethnic population, with a diversity of cultures and corresponding social norms, makes it a natural place to study how social norms shape gender inequality in employment.

We conduct our analysis in two steps. First, to understand how social norms shape gender bias in hiring in online labor markets, we estimate the effects of job applicant gender

[1]Studies are ongoing on the platform, so we do not reveal the name here currently. Please contact the authors directly for more information.

and shared ethnicity (co-ethnicity) with the hiring manager on hiring likelihoods. Different ethnic groups have varying levels of patriarchal norms that accord higher status to men. Concurrently, co-ethnic preferences are significant in Nigeria, as they are in many regions globally (Alesina, Michalopoulos, and Papaioannou, 2016). We use last names to code the ethnicity of applicants and 5,014 hiring managers in the dataset. Our research design exploits hiring manager fixed effects to identify the effects of shared ethnicity with the hiring manager on hiring probabilities of female and male applicants. The results show that, controlling for candidate qualifications, co-ethnic male applicants are 0.3 percentage points (pp) more likely to be hired by hiring managers, equivalent to a 20% boost in the likelihood of being hired, relative to the mean. By contrast, co-ethnic female applicants are 0.4 pp (-15%) less likely to be hired than their male counterparts. This is equivalent to a 5% reduction, relative to the mean, in the likelihood of being hired for co-ethnic female applicants. The co-ethnic gender penalty is larger for women applying to senior roles. It is also larger among less experienced hiring managers, and managers from ethnic groups with stronger patriarchal norms, although it does not differ by the gender of the hiring manager. There is no similar hiring penalty for non-co-ethnic women.

We outline a simple conceptual framework where hiring managers choose job applicants to maximize firm productivity, subject to the supply of qualified candidates from each gender-ethnic group, and the costs of deviating from manager/firm and client preferences around gender hierarchy within groups. We provide suggestive evidence from additional Afrobarometer data on attitudes towards gender equality, and qualitative interviews with managers, that the hiring penalty for co-ethnic female applicants may be driven by hiring managers choosing not to hire co-ethnic women in an attempt to lower perceived productivity costs from deviating from manager/firm and client gender hierarchy preferences within ethnic regions with stronger within group patriarchal norms.

Second, we designed and implemented a randomized controlled trial (RCT) to randomly provide information to hiring managers on the online portal, on the nature of hiring manager gender bias, and the potential firm productivity benefits of hiring a more diverse workforce and more qualified women. Managers are asked to engage in an incentivized resume rating (IRR)[2] exercise and rank the number 1 candidate they would hire for a senior role. The results show that providing this information to hiring managers dampens the co-ethnic gender hiring penalty effects and results in an increase in the share of qualified women from both co-ethnic and non-co-ethnic groups/the diversity of qualified women, that mangers hire in the IRR study.

We add to several literatures. We add to a newer literature on gender inequality in employment in online labor markets with work focused on whether gender bias exists and what drives hiring bias in high information environments like online labor markets (Chan and Wang, 2018). Work has alternatively found positive hiring bias for women in online platform settings (Chan and Wang, 2018) or a female hiring penalty in male-dominated fields (Hangartner, Kopp, and Siegenthaler, 2021). We reconcile these opposing effects by highlighting the importance of social norms in shaping hiring decisions even within online labor markets. We also add to the literature in stratification economics that has highlighted the importance of intersectionality, or multidimensional identities that women hold, on their economic outcomes, in ways that are not simply additive, but can be quantitatively complex, especially for women from marginalized ethnic/racial identities (Darity Jr, 2022; Chelwa, Hamilton, and Stewart, 2022; Darity Jr, Hamilton, and Stewart, 2015; Paul, Zaw, and Darity, 2022; Derous and Pepermans, 2019; Carvalho and Pradelski, 2022; Browne and Misra, 2003; Elu and Loubert, 2013; Maurer-Fazio, Hughes, and Zhang, 2007). This literature has focused largely on the United States and has highlighted the complex ways in which Black-American women, for example, experience gender inequality in employment and labor

[2]Adapting the methodology from Kessler, Low, and Sullivan (2019).

market discrimination in ways that are not simply additive, and are different from their white counterparts (Greenman and Xie, 2008; Paul, Zaw, and Darity, 2022). This work has added important nuance to an older literature on gender and racial/ethnic discrimination in hiring, that only focused on the effects of a single identity on discriminatory labor market outcomes (Altonji and Blank, 1999; Bertrand and Mullainathan, 2004; Bertrand and Duflo, 2017; Galos and Coppock, 2023; Hedegaard and Tyran, 2018; Hjort, 2014; Kline, Rose, and Walters, 2022; Oh, 2023). Finally, we add to the literature on the effects of social norms on gender inequality. Previous work has shown that norms around patrilocality and male favoritism, bride price in Africa and Asia, and caste institutions in India can affect gender inequality, reflected in male-skewed sex ratios in India and China and low female employment in Asia, the Middle East and North Africa (Field, Jayachandran, and Pande, 2010; Jayachandran, 2015, 2020; Alesina, Giuliano, and Nunn, 2013; Pearse and Connell, 2016). Here, we provide new evidence from the largest labor market in Africa to show how social norms may cause gender gaps in hiring to persist in non-standard ways, within ethnic groups.

2 Institutional Setting: Gender and Ethnic Inequality in Nigeria

Nigeria is a multiethnic federation of 224 million people, comprised of 37 administrative states or 36 states and a Federal Capital Territory (FCT) at Abuja[3]. Lagos, the country's most populous state with around 20 million people, is viewed as the country's economic capital, and was the official capital until 1991. The states can be further divided into 6 geopolitical zones in the North and South, that strongly correlate with current and historic ethnic group location as shown in Figure 1 (Archibong, 2018, 2019). While there are over 250 ethnic groups in the country, 3 ethnic groups dominate the population shares, namely the Yorubas and Igbos in the Southwest and Southeast zones respectively, and the Hausas in the Northwest and North-central zones. These 3 groups make up around 20% of the

[3]Source: World Bank estimates, https://datatopics.worldbank.org/world-development-indicators/

population each and are considered ethnic majorities in the country[4]. There are numerous ethnic minorities, with some notable ones in the South, being the Binis or Edos[5] (comprising an estimated 4% of the population), who are considered both geographically and culturally close to the Yorubas, and the Ibibios[6] (4%), located similarly close to the Igbos. Because ethnicity is strongly co-located with geography in Nigeria, with states formed endogenously, partly around ethnic lines, while there are 3 federally recognized ethnic majorities, depending on an individual's location, they may be an ethnic majority in one state, but an ethnic minority in another state. For example, a Yoruba person is an ethnic majority in Lagos state in the southwest, but an ethnic minority in Anambra state in the southeast[7]. There are also religious differences between groups, with the Hausas in the North being mostly Muslim and the Southern ethnicities being more Christian (Archibong, 2019).

Ethnic inequality in access to education, public services and political capital has a long, well-documented history in Nigeria with origins in the colonial period under British rule and post-independence in 1960[8]. The Southern zones/ethnicities are wealthier, better resourced and have higher educational attainment than their counterparts in the North (Archibong, 2018; Fenske and Zurimendi, 2017). On the other hand, many perceive Northerners to have relatively high political capital, since of Nigeria's 14 official presidents since independence, 9 of the 14 or 64% have been Northerners associated with the Hausa ethnic region (Archibong, 2019). Political parties and elections also often occur along ethnic lines, with co-ethnic bias rife in voting (Archibong, Moerenhout, and Osabuohien, 2022; Mudasiru, 2018). Eth-

[4]Nigeria does not publicize a census, but based on reported ethnicity in the nationally representative Afrobarometer surveys, the average population shares between 2003-2014 were as follows: Yorubas (21%), Igbos (16%) and Hausas (24%). Details on the survey are provided in Section 4.

[5]Including all groups identified as Edos or the subgroups of Bini, Esan, Etsako, Urhobo and Isoko people native mostly to Edo state, with some situated in Delta state.

[6]Including all groups identified as Ibibios or the subgroups of Ibibio and Efik people native to Akwa Ibom and Cross River states.

[7]From the Afrobarometer surveys between 2003-2014, Yorubas make up 67% of the population of Lagos state and Igbos make up 97% of the population of Anambra state.

[8]See Archibong (2018) and Archibong (2019) for details.

nic inequality has sometimes erupted into violence, most notably during Nigeria's civil war between 1967-1970, fought partly over control of oil resources located in the southeast region and the subsequent secession by Igbos in the region to create the Republic of Biafra[9] (Archibong, 2019).

Across all ethnic groups, gender norms have historically been patriarchal, with, for example, patrilocality, son preference, and land inheritance rights granted to men, and not women and most groups practicing primogeniture. Within these systems, some groups have had more flexible norms around women's roles than others. Most notable, among the Igbos and Ibibios, is the practice of "male daughters" or "female husbands", where, if a man was unable to have a male child, he could appoint one of his daughters to remain in the family to continue the family line (matrilocality), and confer inheritance rights on the daughter, officially and functionally conferring "male" status on the woman (Amadiume, 2015; Abaraonye, 1997). Yorubas and Binis have historically had stricter patriarchal norms, with no similar allowance for inheritance rights for women (Familusi, 2012; Enakireru and Igbineweka, 2022). Among the Hausas, while cultural norms are similarly strictly patriarchal, Islamic gender norms interact to create a more complex picture of women's roles, with gender based segregation and labor specialization enabling women to enforce gender norms within their separate spheres as well (Barkow, 1972). These norms are partly reflected in educational investments for girls across ethnic regions. Among women, Igbo women are the most educated and experience the lowest levels of gender inequality in education, followed closely by Yoruba and other southern minority women (Archibong, 2018). Hausa women have the lowest levels of education and experience the highest gender inequality in educational attainment in the country. Both ethnicity and gender are generally easily revealed through names, with last

[9]The war led to the massacre of millions of Igbo people and lasting anti-Igbo sentiment among many groups in the country, along with federal policies, in the aftermath, to promote national integration and lower ethnic conflict (Akresh et al., 2023, 2012; Nwodom, Ukah, and Ugochukwu, 2023; Okunogbe, 2024).

names, conveying ethnicity and first names conveying gender[10].

3 Data and Conceptual Framework

3.1 A New Dataset from the Largest Online Labor Market in Nigeria

To estimate the effects of gender and ethnicity on hiring outcomes in online labor markets, we construct a new dataset of 194,190 unique applicants, 24,081 job listings and 5,014 hiring mangers from the largest online job portal in Nigeria between 2016-2018. The job listings are for, mostly, in person jobs that applicants must apply to through the platform. Altogether, these represent over 1.3 million job-applicant matches over 3 years. As discussed in Archibong and Henry (2024), the portal is populated with mostly white collar jobs, with the top 5 industries (50% of applied to listings) represented being Consulting (19%), ICT/Telecommunications (13%), Trade/Services (7%), Manufacturing/Production (6%), and Construction/Real Estate (5%). Altogether, there are 27 industries represented on the platform[11]. Most of the listings are located in urban areas from 2 states: Lagos (68%) and Abuja (13%)[12]. While agriculture, the largest employment category in Nigeria, is underrepresented on the portal given the urban focus of listings, other industries like consulting, construction, and manufacturing are well represented, relative to national level labor statistics on the platform[13] (Archibong and Henry, 2024). Industries are distributed widely throughout states in the country[14]. Table 1 shows a summary of all the data gathered on applicants, job listings and hiring managers, discussed in detail below.

[10]First names can sometimes signal ethnicity as well, if the individual has a non-English first name. A ready example comes from the authors' names: Oyebola Okunogbe (first name= Yoruba + female, last name= Yoruba); Belinda Archibong (first name= female + undetermined ethnicity, last name= Ibibio; Ifeatu Oliobi (first name= Igbo + female, last name= Igbo). Individuals with English last names are usually southern minority ethnic group members from the south-south zone in the country.

[11]As coded by the job portal and shown in Figure A1 in the appendix.

[12]See Figure A2 in the appendix for the full spatial distribution.

[13]Figure A3.

[14]Figure A5.

3.1.1 Job Applicants

Similar to other job portals, job applicants can freely set up a profile including the details found in their CV or resume and uploading their resume[15]. On this online platform, as has been found on others (Chan and Wang, 2018), women are underrepresented and make up just 33% of applicants. Job portal applicants tend to be older (31 years on average), more educated (98% have completed tertiary education and 80% have Bachelor's degrees), with more years of formal work experience (4.5 years) than the average Nigerian job seeker[16]. While applicants provide their gender in the platform data, they do not provide their ethnicity, but they do list their state of origin. We code their ethnicity from their listed state of origin, with states cross-referenced against the Geo-Referencing of Ethnic Groups (GREG) dataset (Weidmann, Rød, and Cederman, 2010; Archibong, 2018). As a robustness check, we manually code the ethnicities of all 194,190 applicants with available data, based on their last names and the match between their last names and first names[17]. We are able to code 5 broad ethnic groups: Yoruba (58% of the applicant sample), Igbo (16%), Hausa (2%), Bini (10%) and Ibibio (3%)[18]. The ethnic shares of applicants correspond to the ethnic distribution of Lagos state, where most of the job listings on the online platform are located[19]. Job listings generally list years of experience and educational attainment as the main qualifications for jobs on the platform. We estimate whether job applicants are qualified by education for a job by taking the difference between the applicant's years of education completed and the job's required years of education, and similarly for years of experience. Applicants are considered qualified for jobs if they at least meet the minimum required education and years

[15]A snapshot of a sample applicant profile on the platform is shown in Figure A4.

[16]The Nigerian median age as of 2024 is 19 years (CIA Factbook), and 28% of the adult population had completed tertiary education as of 2017 (Afrobarometer).

[17]In a spot check with 41% of the sample, there is a high, positive correlation (0.54, $p < 0.001$) between the ethnicities coded by state of origin and coded manually.

[18]We note that since both Hausas and Muslims often have Arabic names, it is difficult to accurately assess the Hausa category based solely on last names, so this category should be interpreted with caution.

[19]According to averages from the 2003-2014 Afrobarometer surveys, in Lagos, 67% are Yoruba, 19% are Igbo, 7% Bini, 2% Ibibio and 0.6% Hausa. The distribution is virtually unchanged using the 2017 survey.

of experience for the job. The results are shown in Table 1. The vast majority of applicants are qualified by education (87%) and experience (93%) for the jobs they apply to.

3.1.2 Firms and Hiring Managers

Most of the firms on the job portal are small and medium enterprises (SMEs) with 100 employees or less, following the trend for firms in Africa as whole (Archibong and Henry, 2024). 79% of the jobs on the platform that applicants are applying to are senior level jobs at the experienced (non-manager), manager level and higher. The monthly salary offers for these jobs are notably higher than the income of the average Nigerian[20], and unemployment was as high as 17.5% in 2017, with figures notably higher for young people (Archibong and Henry, 2024). As such, these jobs are very competitive, with hiring managers receiving, sometimes, hundreds of applications for each listing. Hiring rates from the online applications are low, at around 2% on average[21]. Each hiring manager generally oversees listings for one firm at a time, so the 5,014 managers oversee the equivalent number of firms in the dataset. While job applicants cannot view the name and do not know the identity of the hiring manager, we were able to get this information directly from the platform. The platform only has information on the hiring manager name, but no other demographic details. So, we used LinkedIn profiles to manually code both the gender and ethnicities of all managers with profiles. We were able to code 86% of them as shown in Table 1. Female hiring managers make up 37% of the manager sample. The ethnic distribution of managers mimic the applicant distribution, with Yoruba managers making up the majority of the sample (53%), followed by Igbo managers (23%).

[20]See Archibong and Henry (2024) for details.

[21]In another study, Archibong et al. (2024), we investigate the role of information frictions in low hiring rates in this context.

3.1.3 Summary Statistics

Figure 2 presents some summary statistics on the within ethnic group gender gap in applications and the gender/ethnic gap in hiring in the raw data. Notably, while the gender gap in applications is relatively evenly distributed across ethnic groups (Figure 2(b)), the gender gap in hiring is not, correspondingly, evenly distributed across ethnic groups (Figure 2(c)). From these unconditional means, Ibibio men have the lowest rates of hiring among all male groups and are the only group where the hiring rates for women from their group outpace hiring rates for men. Yoruba women, despite their high representation in the sample, and the fact that most hiring managers are Yoruba, do not have the highest hiring rates across women (they are outpaced by both Ibibio and Igbo women). These gender differences in hiring by ethnicity do not seem to be linked to differences in applicant characteristics as shown in Table A1 in the appendix.

3.2 A Simple Conceptual Framework of How Hiring Managers Make Hiring Decisions

The institutional context in Section 2 shows that co-ethnic preferences are significant in Nigeria, as they are in many regions around the world (Alesina, Michalopoulos, and Papaioannou, 2016). However, the ways these preferences interact with male-biased gender norms, particularly in an employment setting can be complex. To fix ideas regarding the links between hiring decisions of managers and the gender and ethnic identity of applicants, we outline a simple conceptual framework.

We highlight two main predictions on the effects of ethnicity on gender inequality in hiring based on whether the manager is co-ethnic, or shares the same ethnic identity with the job applicant, or non-co-ethnic. The economic setting is a high information labor market (e.g. an online labor market) where managers can get information about applicant qualifications and applicants can find information about firm characteristics in a low cost way.

This setting has varying degrees of patriarchy, with higher status allotted to men. Managers are operating in diverse environments with choice sets over the gender (male (m), female (f)) and ethnicity (co-ethnic (c) or non-co-ethnic (n)) of the applicant. Hiring managers have their own individual preferences over the gender and ethnicity of the applicant, with homophily preferred when possible.

The hiring manager's objective function is to choose i to maximize firm productivity subject to:

1. Supply of qualified $i \in \{i_{mc}, i_{mn}, i_{fc}, i_{fn}\}$
2. The perceived productivity costs from i deviating from HM/firm preferences. This is usually referred to by HMs as $i's$ "cultural fit" within the firm and increases with i's deviation from the median employee in the desired job role at the firm
3. The perceived productivity costs from i deviating from customer/client preferences in a particular region, which increases the more the applicant deviates from the status quo of social or cultural norms for men and women in the region

The first prediction from this framework is that, conditional on (1), if the costs from (2) and (3) are higher than the perceived benefits to firm productivity from hiring i, the HM will choose not to hire that applicant. The second prediction is that while co-ethnicity is valued by HMs, if there is an ethnic majority, x, within a particular region, where hiring managers, job applicants and clients mostly come from the same ethnic or cultural group, x, hiring managers will choose:

a. $i_{mc} \succ i_{mn}$
b. $i_{mc} \succeq i_{fc}$ and choose to hire co-ethnic men (i_{mc}), and reduce hiring of co-ethnic women (i_{fc}), particularly if co-ethnic women are applying to roles that upset the status quo gender hierarchy (e.g. senior/managerial roles with status over men) within groups

c. They will not apply the same norms to non-co-ethnic women, i_{fn} as they do to i_{fc}, who they view as existing outside of own-group norms and hence may not increase costs in (2) and (3) as much as i_{fc}. This is especially true if HM perceives i_{fn} to be not just non-co-ethnic, but also ethnically/culturally distant from HM's group

In more patriarchal groups where costs in (3) can be especially high, the HM preference will be strict, and $i_{mc} \succ i_{fc}$, with the preference weaker in less patriarchal groups. In contrast if the HM is a minority or out-group member y in ethnic region x, they may hire i to reduce the costs to (3) while trying to satisfy their own preferences for co-ethnicity and lower "fit" costs in (2). In this case, they may even choose to hire more co-ethnic women, such that $i_{fc} \succeq i_{mc}$ in x. This framework may explain the lower hiring rates for Yoruba women shown in Section 3.1.3, and we test predictions from the framework in Section 4.

4 Research Design and Results

4.1 Empirical Strategy

In the main analysis, we estimate the following linear probability model[22] specification:

$$\begin{aligned} \text{Hired}_{ijdst} = \beta \text{Female}_{idst} + \gamma \text{Same Ethnicity}_{ijdst} \\ + \alpha \underbrace{\text{Female}_{idst} \times \text{Same Ethnicity}_{ijdst}} \\ + \mathbf{X}'_{ijdst}\psi + \mu_j + \phi_d + \eta_s + \delta_t + \epsilon_{ijdst} \end{aligned} \tag{1}$$

where $Hired_{ijdst}$ is the hiring outcome of interest for job applicant or candidate i applying to a job evaluated by hiring manager j in industry d in state s and year t. The outcome is an indicator that equals 1 if i was hired and 0, otherwise. 'Female' and 'Same Ethnicity' are indicators that equal one if the candidate is female and co-ethnic with the hiring manager,

[22]The results remain unchanged with alternate model specifications, using a probit model, with the main results shown in Table A3 in the appendix.

respectively. The specification includes individual job candidate and firm controls, with a key control being candidate qualifications, by education and years of experience, for the job as described in Section 3.1.1[23], $\mathbf{X}'_{ijdst}$, and industry (ϕ_d), and year (δ_t) fixed effects. It also includes job location fixed effects for the location of the job listing in one of Nigeria's states, η_s. Crucially, for identification, the specification includes hiring manager fixed effects μ_j, so we can evaluate hiring decisions of multiple applicants made by the same hiring manager. Since each manager oversees one firm, μ_j also functions as firm fixed effects in the model. The coefficient of interest is α which estimates the effects of hiring manager co-ethnicity on the likelihood of being hired for female applicants. We also test and include outcomes from the uninteracted model in Equation 1 in the results.

4.2 Results

Table 2 shows the results from Equation 1. The main results are in column (2). All else being equal/controlling for candidate qualifications[24], co-ethnic male applicants are 0.3 percentage points (pp) more likely to be hired by hiring managers, equivalent to a 20% boost in the likelihood of being hired, relative to the mean. The estimate of α is -0.004, which means that co-ethnic female applicants are 0.4 pp (-15%) less likely to be hired than their male counterparts. This is equivalent to a 1pp reduction, or a 5% reduction relative to the mean, in the likelihood of being hired for co-ethnic female applicants. The results from a joint F-test on the 'Same Ethnicity' and 'Female x Same Ethnicity' interaction coefficients rejects the null that the coefficients are jointly equal to zero ($p < 0.05$). Co-ethnicity and Female in the uninteracted model (1) do not robustly predict hiring probability. Since most of the jobs are located in Lagos, with the Lagos sample comprising 79% of the complete dataset, for a tighter test of the conceptual framework predictions, we estimate Equation 1, limiting the sample to matches in Lagos state only in columns (3) and (4) of Table 2. When we limit the

[23]Including individual controls for candidate age and firm controls for firm size.

[24]Importantly, these qualifications robustly, positively, predict the applicant's likelihood of being hired as shown in Table A2 in the appendix.

sample to just Lagos, the results show that co-ethnicity, but not gender, robustly predicts hiring probability (column (3)). The results in column (4) show that the co-ethnic gender bias identified in the full sample remains unchanged in the Lagos only sample, with identical results. There is no similar hiring penalty or effect for non-co-ethnic women (column (2) and column (4)).

4.3 Mechanisms

Is the co-ethnic gender hiring penalty for co-ethnic women being driven by hiring managers choosing not to hire co-ethnic women in an attempt to lower perceived productivity costs to deviating from HM/firm and customer preferences within ethnic majority regions with strong patriarchal norms as discussed in Section 3.2 or something else? To assess this, we estimate Equation 1 in split samples by candidate, industry and hiring manager characteristics, with results in Figure 3. Among candidate characteristics, α is larger for co-ethnic women applying to senior roles (-0.5 pp), than junior roles (-0.3 pp). The effects are also larger for older women (-0.6 pp), who are above the mean age of women applicants in the sample (29 years), and are also more likely to be applying to senior roles[25], and competing with older men applying for those same roles. The effect disappears for younger women and men. The co-ethnic gender penalty effects are slightly larger for women applying to male-skewed industries (-0.5 pp) vs female-skewed industries (-0.4 pp)[26]. The effects do not appear to be driven purely by customer bias either, since the effects are robust in client-facing and non-client-facing industries[27]; though the co-ethnic gender penalty is slightly larger for co-ethnic women applicants in client-facing industries (-0.5 pp vs -0.4 pp). Among hiring managers, α does not differ by the gender of the hiring manager, with male and female hiring managers assigning

[25]Pearson's correlation coefficient between women aged over 29 in the sample and applications to senior roles is 0.3 ($p < 0.001$). The coefficient between women aged under 29 and applications to senior roles is -0.3 ($p < 0.001$).

[26]Male-skewed industries are where men make up the majority of applications to the industry. The distribution is shown in Figure A6.

[27]We code client-facing industries as industries with a majority share of job roles with sales functions in the title. Figure A7 shows the industry distribution.

the same co-ethnic gender penalty to co-ethnic female applicants (-0.4 pp). The penalty exists among more experienced and less experienced managers[28], though less experienced managers assign a higher co-ethnic gender penalty to co-ethnic female applicants (-0.8 pp) than more experienced managers (-0.3 pp). Yoruba hiring managers also assign a greater co-ethnic gender hiring penalty (-0.6 pp) to female applicants, but Igbo managers do not[29].

The results from the subsamples showing larger penalties for co-ethnic women applying to senior roles, and client-facing industries, but with no differences by the gender of the hiring manager, so far are in line with the predictions of the conceptual framework. The result on larger effects from less experienced managers are in line with previous literature showing that less experienced hiring managers tend to default to social norm heuristics, reflected in gender hiring bias, at a higher rate than more experienced managers (Chan and Wang, 2018). But what explains the result on the effects being large and robust among Yoruba, but not Igbo managers? To answer this, we show evidence of heterogeneity in the level of patriarchal norms across ethnic groups using evidence from the nationally representative Afrobarometer surveys from 2003-2014[30]. In these years, the surveys ask adult respondents about whether they agree or not with two statements on gender norms: (1) "Women should have equal rights and same treatment as men" vs (2) "Women should be subject to traditional laws". We code a gender equal attitudes indicator outcome that equals 1 if the respondent agrees with statement (1) and disagrees with statement (2), and 0 if the respondent agrees, instead, with statement (2) and disagrees with statement (1). Figure 4 shows the coefficient results from regressions of respondent ethnicity (left) and respondent gender x ethnicity interactions (right) on the gender equal attitudes outcome[31]. Of the 5 groups studied, 2 of the 5 report

[28]More experienced managers are defined as managers handling greater than the average (278) number of applications per year in the sample.

[29]Sample sizes are too small to fully compare outcomes for managers from other ethnic groups, so we focus on Yorubas and Igbos here.

[30]The surveys ask respondents about their home language of origin which corresponds to their ethnicity.

[31]All regressions include controls for educational attainment and year of birth, survey year and district fixed effects. Table A4 shows the full results in the appendix.

significantly less gender equal attitudes/more patriarchal norms: the Yorubas (4pp less likely to agree with statement 1) and Hausas (-7 pp). Estimates for Binis are large but imprecise. The estimates for Igbos and Ibibos are indistinguishable from zero. When we examine results from the interacted regression with gender in the figure on the right, we find that the effects for Yorubas and Binis are driven by men from those groups. In contrast, Hausa women drive the negative result on gender attitudes in their group. The results are in line with the historical evidence on the strength of patriarchal norms among these groups, discussed in Section 2.

Finally, we conducted focus group interviews, in partnership with the online job platform, with 30 hiring managers for 3.5 hours across 2 sessions on September 26, 2023 at the platform's headquarters in Lagos. Respondents, in groups of 15 per session, were asked questions about challenges they faced in filling vacancies and their experiences with hiring women for senior roles[32]. Hiring managers, both male and female, highlighted the importance of candidates, especially women, aligning with their firm's organizational culture, with both mentioning how societal gender norms and children/childcare duties negatively affected their preference for hiring women in senior roles, reflected in the word cloud in Figure A9 in Appendix A.2.

Altogether, the results suggest that the co-ethnic gender hiring penalty for co-ethnic female applicants is being driven by hiring managers choosing not to hire co-ethnic women in an attempt to lower perceived productivity costs from deviating from manager/firm and client gender hierarchy preferences within ethnic regions with stronger within group patriarchal norms, like among the Yorubas in Lagos, where most of the job listings are located[33].

[32]The full script and outline is shown in Figure A8 in the appendix. About half of managers in the group were women.

[33]We test alternative predictions of the framework about how hiring manager behavior towards co-ethnic female applicants may change if they are ethnic minority y in a majority ethnicity x job location, and provide suggestive evidence that the predictions from Section 3.2 hold in Section A.3 in the appendix.

5 The Effects of Information: Evidence from a Randomized Experiment

Can providing information to hiring managers about manager gender bias and highlighting the potential productivity benefits of hiring a more diverse workforce and more qualified women dampen the co-ethnic gender penalty effect? If hiring managers value maximizing firm productivity, then providing information about the benefits of diversity and reducing gender bias for increasing firm productivity may reduce the co-ethnic gender bias in hiring described in Section 4. To explore the effects of information on the gender bias in hiring, we designed an RCT with a Qualtrics experiment. The outline of the experiment is described briefly here, with details provided in Appendix A.4. Between April 4, 2023 and June 30, 2023, we sent out emails inviting 7,922 active hiring managers on the online job portal to participate in a study about how hiring managers make hiring decisions. We had a 5% response rate with 411 managers participating in the experiment. We conducted the experiment in steps[34]. First we collect some demographic information on stated preferences in candidates from managers[35]. Then we provide them with 2 true (unshared with them ex-ante) statements about the platform and ask all of them to answer True or False. The statements are:

1. Statement A: "More than 50% of jobs [on the platform] are based in Lagos"
2. Statement B: "Hiring managers are, on average, more likely to hire qualified men over equally qualified women applicants for jobs"

Then hiring managers are randomly assigned to receive the correct answer that either Statement A is true or Statement B is true. The full details of both statements are shown

[34]Outlined in detail in Figure A10.

[35]There are no differences in stated candidate preferences by hiring manager ethnicity or gender as shown in Figure A11.

in Figure A12 in Appendix A.4, but importantly for the RCT, the treatment group receives the following full message (with certain words in bold) "Based on the analysis of data on hiring managers on online platforms like [name of online portal], **Hiring Managers** are, on average, more likely to hire qualified men over equally qualified women applicants for jobs. **Evidence shows that hiring a more diverse workforce and hiring more qualified women can significantly improve firm performance and value.**". They are then provided with the snapshot profiles of 10 fictional, but based on real resume composites, candidates and are asked to engage in an incentivized resume rating (IRR)[36] exercise and first shortlist 4 candidates, then rank the number 1 candidate they would hire for a Senior Analyst position with minimum qualifications of a Bachelor's degree and 4 years of experience as shown in Figure A13 in Appendix A.4[37].

The mix of candidates is chosen with names to reflect the gender (40% women, 60% men) and ethnic composition (60% Yoruba, 20% Igbo, 20% English/Southern ethnic minority other) of the platform. The profiles are also assigned different qualifications by education and experience, such that there is an unambiguous ranking of qualified candidates vs non-qualified candidates as shown in Figure 5[38]. For example, the topmost qualified candidates are the Yoruba and Igbo female candidates with BSC honors and MBA degrees and 6 years of experience (YOE) (rank 1), followed by the English name female candidate with BSC honors and 6 YOE, then the 3 male candidates (Yoruba, Igbo and English) with BSC and 6 YOE. The unqualified, with less than the job required education and or YOE, candidates include all Yoruba males and 1 Yoruba female candidate. Hiring managers can then select their shortlisted candidates and see their CVs[39]. Note that by design of the experiment,

[36] Adapting the methodology from Kessler, Low, and Sullivan (2019).

[37] Senior Analyst is a typical title in this context and generally requires those qualifications, as gleaned from the administrative data in Section 3.

[38] They also includes the NYSC year, for Nigeria's National Youth Service Program, which is equivalent to a candidate's graduation year and signals age of the candidate (Okunogbe, 2024).

[39] With a sample CV shown in Figure A14. The CVs are based on real resumes received by the authors during the experiments. Profiles are shown in random order to managers.

we have manipulated the candidate qualification rankings, such that, a completely unbiased manager, who cares only about choosing the most qualified candidate, should always choose the Yoruba or Igbo female candidate, randomly, in rank 1, with no co-ethnic or male preference. The manipulated candidate ranking is in clear departure from the all else equal condition established in the research design in Section 4.

The sample is balanced, and the experiment hiring manager gender and ethnic distribution reflects the platform manager sample described in Section 3.1.2[40]. We then estimate the specification in Equation 2:

$$\mathrm{Y}_j = \beta \mathrm{Treatment}_j + \gamma \mathrm{HM\ Ethnicity}_j + \alpha \underbrace{\mathrm{Treatment}_j \times \mathrm{HM\ Ethnicity}_j} + \mathbf{X}'_j \psi + \epsilon_j \quad (2)$$

where Y_j is an indicator that equals one if the hiring manager j, ranks one of the 10 hypothetical candidates as their number 1 hire. We include hiring manager characteristic controls, $\mathbf{X}'_j$, for estimate precision. We focus on the hiring choices of Yoruba managers, since they make up the majority of the sample and given the Yoruba manager driven results in Section 4.3[41]. The coefficient of interest is, as before, α, estimating the effects of the information treatment on the hiring choice of qualified (female) candidates by hiring manager ethnicity.

The results in Table 3 echo the results from Table 2 showing that, in Lagos, a Yoruba region with mostly Yoruba managers, hiring managers are more likely to hire the most qualified, Yoruba, co-ethnic candidate, who is the top qualified Yoruba female candidate in this case (column (1) and column (2) of Panel A).The information treatment itself, which emphasized both diversity, but more explicitly gender, and did not address ethnicity explicitly, has

[40]The experiment sample is 38% female and 51% Yoruba. Details are provided in Appendix A.4.
[41]We show results for Igbo managers, a smaller share of the sample in Table A9 in the appendix.

no effect on hiring manager behavior across all candidates (columns (1), (3), (5) of Panels A and B). The effects of the treatment on the hiring of qualified female candidates does however differ by hiring manager co-ethnicity with the qualified female candidates. While hiring managers in the control group exhibit strong co-ethnic bias, with Yoruba managers, 28 pp more likely to hire the top qualified Yoruba female candidate (column (2)), the treatment, highlighting the importance of diversity for firm productivity, dampens the co-ethnic effect, reducing this likelihood by 21 pp to +7 pp for Yoruba managers. Treated Yoruba managers are more likely (+15 pp over the control group) to consider hiring the top qualified English name/Southern minority female candidate, reversing the co-ethnic bias from -7 pp for non-co-ethnic women to +8 pp for non-co-ethnic women. Notably, the co-ethnic male bias still remains among Yoruba managers, such that they are 4 pp more likely, on average, to hire the less qualified than the co-ethnic woman, though still qualified, co-ethnic male applicant (column (1) of Panel B), providing more evidence against the unbiased ranking model described previously[42]. Yoruba managers do not appear to be misinformed about the nature of hiring manager gender bias[43]. The results suggest that providing information to hiring managers on HM gender bias that highlights potential firm productivity gains from hiring a diverse workforce and more qualified women can dampen the co-ethnic gender hiring penalty effects and result in an increase in the share of qualified women from both co-ethnic and non-co-ethnic groups/the diversity of qualified women, that mangers hire.

6 Conclusion

Social norms that shape expectations of women's roles within groups can cause gender inequality in employment to persist, even in high information environments like online labor markets. In this paper, we show this by examining the effects of gender and ethnicity on

[42]They do not express any interest in hiring the clearly unqualified Yoruba male candidate as shown in Table A8 in the appendix.

[43]As shown in their True/False answers to Statements A and B in Table A10.

hiring outcomes in the largest online job platform in Nigeria. Our results show significant co-ethnic gender bias, where co-ethnic women experience a co-ethnic gender penalty and are less likely to be hired in these labor markets, especially for senior roles. Male co-ethnic applicants, in contrast, are more likely to be hired for these positions. The results suggest that the co-ethnic gender hiring penalty for co-ethnic women is being driven by hiring managers choosing not to hire co-ethnic women in an attempt to lower perceived productivity costs from deviating from manager/firm and client gender hierarchy preferences within ethnic regions with strong patriarchal norms. A field experiment providing information to hiring managers on manager hiring gender bias and highlighting the potential firm productivity gains of a diverse workforce and hiring more qualified women, dampens the co-ethnic gender hiring penalty effects and results in an increase in the share of qualified women from both co-ethnic and non-co-ethnic ethnic groups that hiring managers are willing to hire. In ongoing work, we study the medium and long-run effects of providing information to hiring managers on manager hiring gender bias.

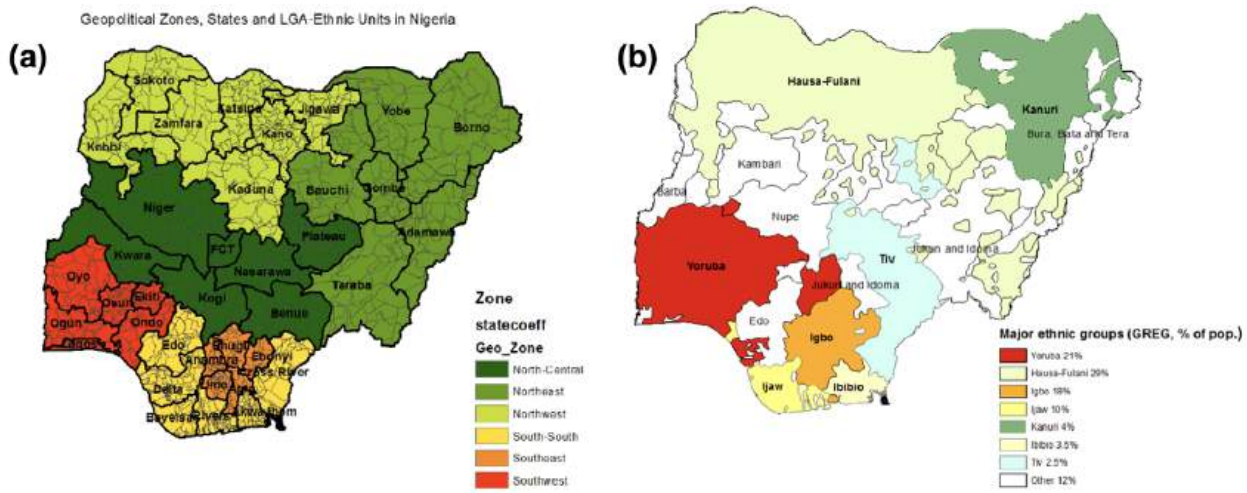


Figure 1: Map of Nigeria with states and geopolitical zones (a) and ethnic regions (b) shown

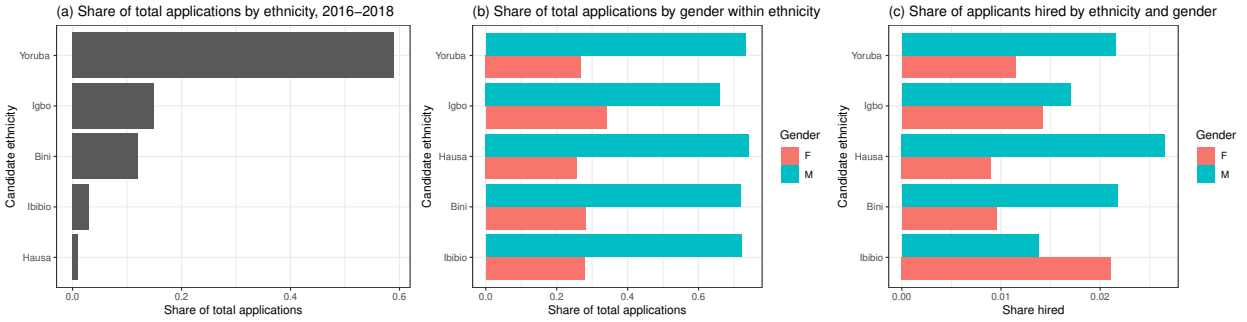


Figure 2: Share of total applications and share hired by gender and ethnicity, 2016-2018

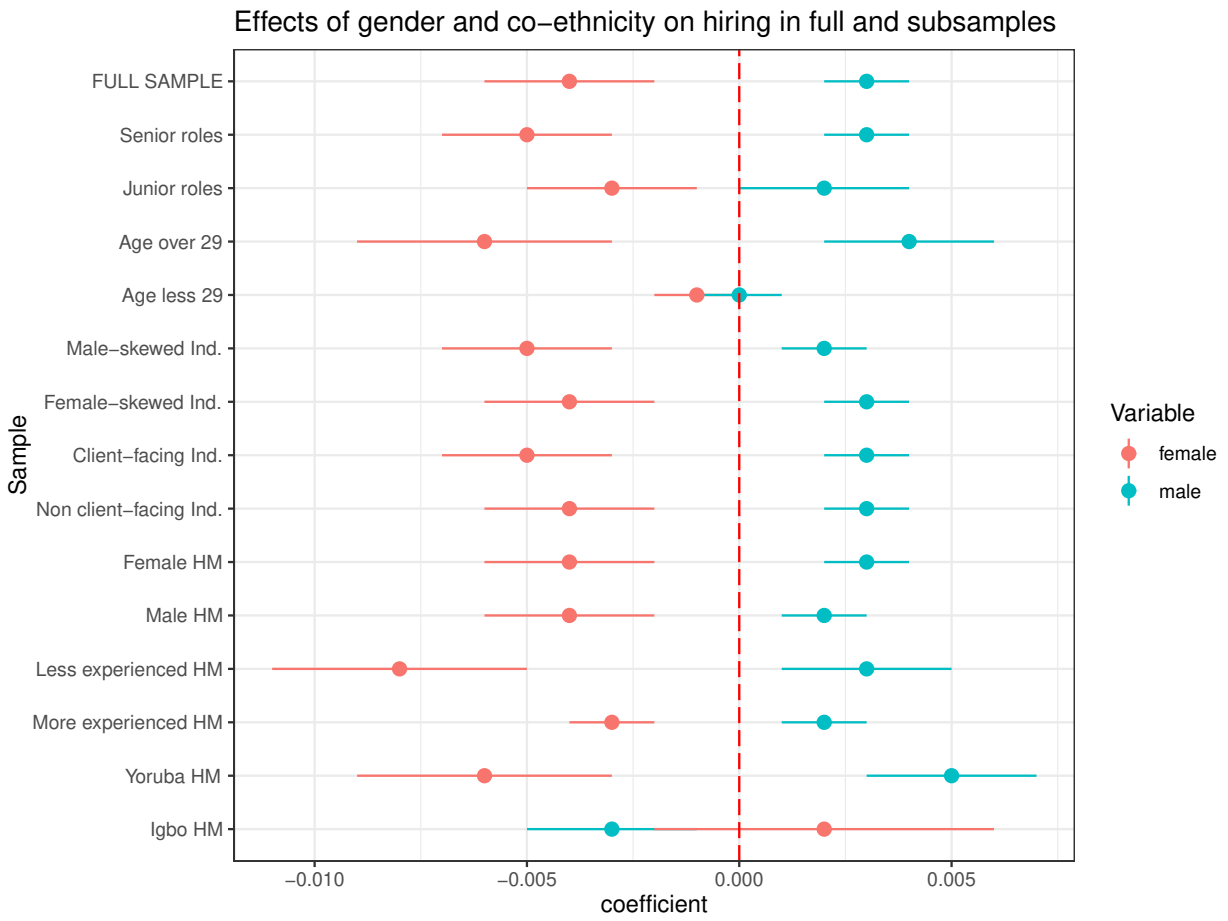


Figure 3: Regression estimates of the effects of gender and co-ethnicity on hiring in full and subsamples

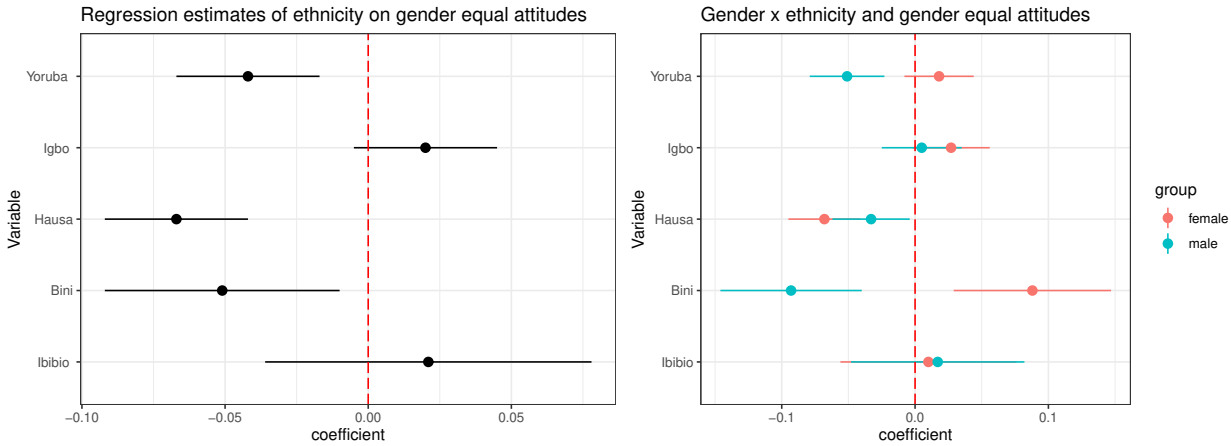


Figure 4: Gender equal attitude outcomes by reported ethnicity and gender from Afrobarometer surveys, 2003-2014

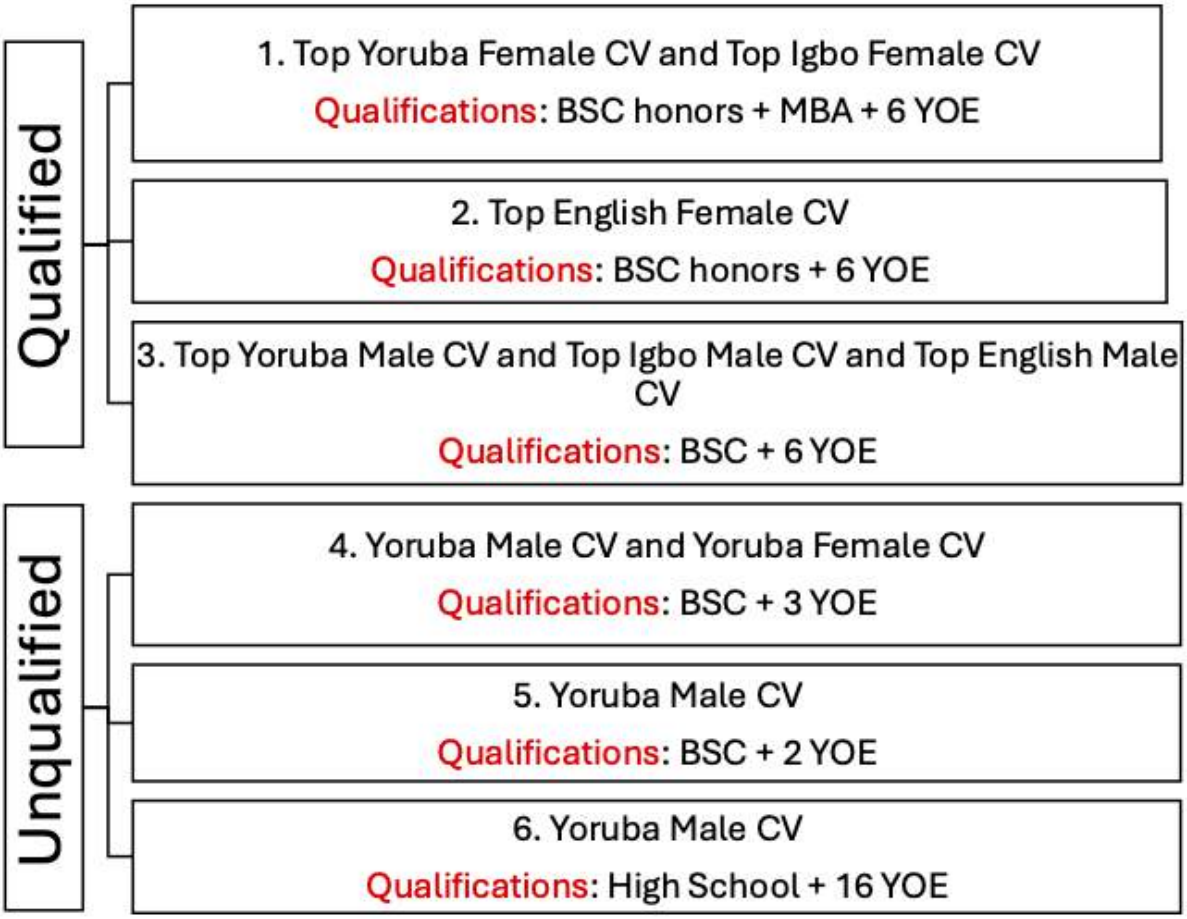


Figure 5: IRR experiment: Objective resume ranking for Senior Analyst role requiring Bachelor's degree and $\geq$ 4 years of experience (YOE)

Table 1: A New Dataset of an Online Labor Market: Candidate, job listing and hiring manager summary statistics

Statistic	N	Mean	St. Dev.	Min	Max
		Unique Applicant Summary Statistics			
Female	183,668	0.33	0.47	0.00	1.00
Ethnic Majority	163,329	0.76	0.43	0.00	1.00
Share Yoruba	163,329	0.58	0.49	0.00	1.00
Share Igbo	163,329	0.16	0.37	0.00	1.00
Share Hausa	163,329	0.02	0.13	0.00	1.00
Share Bini	163,329	0.10	0.30	0.00	1.00
Share Ibibio	163,329	0.03	0.17	0.00	1.00
Age	160,071	30.93	6.21	16.00	113.00
Years of Experience (YOE)	194,015	4.50	4.27	0.00	50.00
Tertiary Education	190,867	0.98	0.13	0	1
Bachelor's Degree or Higher	190,867	0.78	0.41	0	1
Hired	75,847	0.02	0.13	0.00	1.00
Qualified YOE	185,586	2.64	3.54	−15.00	49.00
Qualified YOE (Indicator)	185,586	0.93	0.21	0.00	1.00
Qualified Education	190,012	0.78	1.42	−7.00	8.00
Qualified Education (Indicator)	190,012	0.87	0.29	0.00	1.00
Total Number of Jobs Applied	194,190	7.18	22.86	1	1,685
		Job Listings Summary			
SME Size	24,061	0.85	0.36	0	1
Full Time Job	24,081	0.92	0.28	0	1
Job YOE	21,867	2.53	2.37	0.00	15.00
Job Level	24,081	3.84	0.93	1	6
Senior Job Level	24,081	0.79	0.41	0	1
Job Education	23,605	5.06	1.59	1.00	9.00
Minimum Salary (Naira)	24,081	82,485.15	304,664.30	0	25,000,000
		Hiring Manager Summary			
Female	3,955	0.37	0.48	0.00	1.00
Ethnic Majority	4,320	0.80	0.40	0.00	1.00
Share Yoruba	4,320	0.53	0.50	0.00	1.00
Share Igbo	4,320	0.23	0.42	0.00	1.00
Share Hausa	4,320	0.03	0.18	0.00	1.00
Share Bini	4,320	0.06	0.24	0.00	1.00
Share Ibibio	4,320	0.02	0.14	0.00	1.00

Notes: See text and online appendix for details. YOE is years of experience. Job Level is defined on a scale of 1-6 where 1= Vocational/semi-skilled/unskilled labor, 2=Undergraduate internship/vacation job, 3= Fresh graduate/Entry level/Graduate internship, 4=Experienced (Non-Manager), 5= Manager (Staff Supervisor/Head of Department), 6=Executive (Director/CEO/CFO/COO). SME Size is the share of firms with 100 employees or less according to Central Bank of Nigeria guidelines. Job Education: 1= vocational or high school degree, 2= Diploma, 3= OND (Ordinary National Diploma), 4= NCE (Nigeria Certificate in Education, 5= HND (Higher National Diploma), 6= Degree, 7= MBBS (Bachelor in medicine/surgery), 8= MBA/MSC, 9= MPhil/Phd; Ethnic Majority is an indicator that equals 1 if the candidate belongs to one of the three major ethnic groups- Yoruba, Igbo or Hausa.

Table 2: Effects of job applicant gender and shared ethnicity with the hiring manager on hiring outcomes

Outcome:	**Hired**			
Sample/Job Location:	All	All	Lagos	Lagos
	(1)	(2)	(3)	(4)
Female	−0.0001	0.001	−0.001	0.001
	(0.001)	(0.001)	(0.001)	(0.001)
Same Ethnicity	0.001	0.003**	0.002**	0.003***
	(0.001)	(0.001)	(0.001)	(0.001)
Female x Same Ethnicity		−0.004***		−0.004***
		(0.002)		(0.001)
Mean of outcome	0.02	0.02	0.02	0.02
N	353,205	353,205	277,644	277,644
R^2	0.042	0.043	0.030	0.030
Joint F-test (p-value)		0.019		0.008
Candidate controls	Yes	Yes	Yes	Yes
Firm controls	Yes	Yes	Yes	Yes
Hiring Manager FE	Yes	Yes	Yes	Yes
Industry FE	Yes	Yes	Yes	Yes
Job Location FE	Yes	Yes	No	No
Year FE	Yes	Yes	Yes	Yes

Notes: Regressions estimated by OLS. Robust standard errors in parentheses clustered by candidate. Dependent variable is an indicator that equals one if the candidate was hired. Candidate controls include candidate age and level of candidate qualification for the job by education and years of experience. Firm controls include company size. Year FE is year of job posting fixed effects. Hiring manager is the firm's hiring manager. Job Location fixed effects are state fixed effects for the Nigerian administrative state (with an outside of Nigeria option) the job listing is located in. Joint F-test (p-value) is the test of joint significance from the OLS regression of the candidate being hired on the 'Same Ethnicity' and 'Female x Same Ethnicity' variables. ***Significant at the 1 percent level, **Significant at the 5 percent level, *Significant at the 10 percent level.

Table 3: Effects of hiring information treatment on Yoruba hiring manager incentivized resume rating (IRR) applicant hiring choice

	Panel A: Choice of Top Qualified Female Candidates by Ethnicity					
Outcome:	Top Qualified Yoruba F		Top Qualified Igbo F		Top Qualified English F	
	(1)	(2)	(3)	(4)	(5)	(6)
Treatment	−0.043	0.063	−0.016	−0.060	0.008	−0.069
	(0.059)	(0.078)	(0.058)	(0.087)	(0.033)	(0.045)
Yoruba HM	0.184***	0.282***	−0.115*	−0.156*	0.001	−0.071*
	(0.060)	(0.079)	(0.060)	(0.083)	(0.032)	(0.041)
Treatment x Yoruba HM		−0.209*		0.088		0.153**
		(0.117)		(0.117)		(0.063)
Mean of outcome	0.258	0.258	0.246	0.246	0.051	0.051
N	248	248	248	248	248	248
R^2	0.078	0.089	0.089	0.091	0.018	0.039
	Panel B: Choice of Qualified Male Candidates by Ethnicity					
Outcome:	Qualified Yoruba M		Qualified Igbo M		Qualified English M	
	(1)	(2)	(3)	(4)	(5)	(6)
Treatment	0.019	0.016	0.016	0.043	−0.007	−0.017
	(0.023)	(0.017)	(0.027)	(0.041)	(0.029)	(0.049)
Yoruba HM	0.043*	0.040	−0.016	0.008	−0.044	−0.053
	(0.023)	(0.026)	(0.027)	(0.035)	(0.029)	(0.042)
Treatment x Yoruba HM		0.006		−0.052		0.018
		(0.045)		(0.054)		(0.059)
Mean of outcome	0.022	0.022	0.027	0.027	0.034	0.034
N	248	248	248	248	248	248
R^2	0.036	0.036	0.014	0.018	0.017	0.017
Individual controls	Yes	Yes	Yes	Yes	Yes	Yes

Notes: Regressions estimated by OLS. Robust standard errors in parentheses. Treatment is an indicator for the hiring information treatment as described in text. Yoruba HM is an indicator that equals one if the hiring manager is Yoruba. Top Qualified Yoruba F is an indicator that equals one if the hiring manager ranks the following applicant as their number 1 pick to hire for the senior analyst role: the most highly qualified (by education and experience listed in the job description for the role) candidate who is also female and Yoruba. Qualified Yoruba M an indicator that equals one if the hiring manager ranks the following applicant as their number 1 pick to hire for the senior analyst role: the less qualified (by education and years of experience) than the top qualified female candidates, but still qualified male, Yoruba candidate. Individual controls include age, gender, educational attainment, years of experience, marital status, and number of dependents of the hiring manager. ***Significant at the 1 percent level, **Significant at the 5 percent level, *Significant at the 10 percent level.

References

Abaraonye, Felicia Ihuoma. 1997. "Gender relations in Ibibio traditional organizations." *Dialectical anthropology* 22 (2): 205–222.

Akresh, Richard, Sonia Bhalotra, Marinella Leone, and Una Okonkwo Osili. 2012. "War and stature: Growing up during the Nigerian civil war." *American Economic Review* 102 (3): 273–277.

Akresh, Richard, Sonia Bhalotra, Marinella Leone, and Una Osili. 2023. "First-and second-generation impacts of the Biafran war." *Journal of Human Resources* 58 (2): 488–531.

Alesina, Alberto, Paola Giuliano, and Nathan Nunn. 2013. "On the origins of gender roles: Women and the plough." *The quarterly journal of economics* 128 (2): 469–530.

Alesina, Alberto, Stelios Michalopoulos, and Elias Papaioannou. 2016. "Ethnic inequality." *Journal of Political Economy* 124 (2): 428–488.

Altonji, Joseph G, and Rebecca M Blank. 1999. "Race and gender in the labor market." *Handbook of labor economics* 3: 3143–3259.

Amadiume, Ifi. 2015. *Male daughters, female husbands: Gender and sex in an African society.* Zed Books Ltd.

Archibong, Belinda. 2018. "Historical origins of persistent inequality in Nigeria." *Oxford Development Studies* 46 (3): 325–347.

Archibong, Belinda. 2019. "Explaining divergence in the long-term effects of precolonial centralization on access to public infrastructure services in Nigeria." *World Development* 121: 123–140.

Archibong, Belinda, Francis Annan, Oyebola Okunogbe, Ifeatu Oliobi, and Glory Aiyegbeni. 2024. Information Frictions and Gender Inequality in Online Labor Markets. Technical report Working paper.

Archibong, Belinda, and Peter Blair Henry. 2024. "Shocking Offers: Gender, Wage Inequality, and Recessions in Online Labor Markets." *AEA Papers and Proceedings* 114: 196–200.

Archibong, Belinda, Tom Moerenhout, and Evans Osabuohien. 2022. "Protest matters." *Brookings Global Working Paper No. 172* .

Bandiera, Oriana, Ahmed Elsayed, Andrea Smurra, and Céline Zipfel. 2022. "Young adults and labor markets in Africa." *Journal of Economic Perspectives* 36 (1): 81–100.

Barkow, Jerome H. 1972. "Hausa women and Islam." *Canadian Journal of African Studies/La Revue canadienne des études africaines* 6 (2): 317–328.

Bertrand, Marianne, and Esther Duflo. 2017. "Field experiments on discrimination." *Handbook of economic field experiments* 1: 309–393.

Bertrand, Marianne, and Sendhil Mullainathan. 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.

Browne, Irene, and Joya Misra. 2003. "The intersection of gender and race in the labor market." *Annual review of sociology* 29 (1): 487–513.

Carvalho, Jean-Paul, and Bary SR Pradelski. 2022. "Identity and underrepresentation: Interactions between race and gender." *Journal of Public Economics* 216: 104764.

Chan, Jason, and Jing Wang. 2018. "Hiring preferences in online labor markets: Evidence of a female hiring bias." *Management Science* 64 (7): 2973–2994.

Chelwa, Grieve, Darrick Hamilton, and James Stewart. 2022. "Stratification economics: Core constructs and policy implications." *Journal of Economic Literature* 60 (2): 377–399.

Darity Jr, William A. 2022. "Position and possessions: Stratification economics and intergroup inequality." *Journal of Economic Literature* 60 (2): 400–426.

Darity Jr, William A, Darrick Hamilton, and James B Stewart. 2015. "A tour de force in understanding intergroup inequality: An introduction to stratification economics." *The Review of Black Political Economy* 42 (1-2): 1–6.

Derous, Eva, and Roland Pepermans. 2019. "Gender discrimination in hiring: Intersectional effects with ethnicity and cognitive job demands." *Archives of Scientific Psychology* 7 (1): 40.

Elu, Juliet U, and Linda Loubert. 2013. "Earnings inequality and the intersectionality of gender and ethnicity in Sub-Saharan Africa: The case of Tanzanian manufacturing." *American Economic Review* 103 (3): 289–292.

Enakireru, EO, and Faith Osohuotue Igbineweka. 2022. "An Appraisal of Women's Rights to Inheritance under the Bini Custom in the Light of the Legal Framework for Testate and Intestate Successions in Nigeria." *LASJURE* 3: 117.

Familusi, Olumuyiwa O. 2012. "African culture and the status of women: The Yoruba example." *The Journal of Pan African Studies* 5 (1): 299–313.

Fenske, James, and Igor Zurimendi. 2017. "Oil and ethnic inequality in Nigeria." *Journal of Economic Growth* 22: 397–420.

Field, Erica, Seema Jayachandran, and Rohini Pande. 2010. "Do traditional institutions constrain female entrepreneurship? A field experiment on business training in India." *American Economic Review* 100 (2): 125–129.

Galos, Diana Roxana, and Alexander Coppock. 2023. "Gender composition predicts gender bias: A meta-reanalysis of hiring discrimination audit experiments." *Science Advances* 9 (18): eade7979.

Greenman, Emily, and Yu Xie. 2008. "Double jeopardy? The interaction of gender and race on earnings in the United States." *Social Forces* 86 (3): 1217–1244.

Hangartner, Dominik, Daniel Kopp, and Michael Siegenthaler. 2021. "Monitoring hiring discrimination through online recruitment platforms." *Nature* 589 (7843): 572–576.

Hedegaard, Morten Størling, and Jean-Robert Tyran. 2018. "The price of prejudice." *American Economic Journal: Applied Economics* 10 (1): 40–63.

Hjort, Jonas. 2014. "Ethnic divisions and production in firms." *The Quarterly Journal of Economics* 129 (4): 1899–1946.

Jayachandran, Seema. 2015. "The roots of gender inequality in developing countries." *Annual review of economics* 7 (1): 63–88.

Jayachandran, Seema. 2020. Social norms as a barrier to women's employment in developing countries. Technical report National Bureau of Economic Research.

Kessler, Judd B, Corinne Low, and Colin D Sullivan. 2019. "Incentivized resume rating: Eliciting employer preferences without deception." *American Economic Review* 109 (11): 3713–3744.

Kline, Patrick, Evan K Rose, and Christopher R Walters. 2022. "Systemic discrimination among large US employers." *The Quarterly Journal of Economics* 137 (4): 1963–2036.

Maurer-Fazio, Margaret, James Hughes, and Dandan Zhang. 2007. "An ocean formed from one hundred rivers: the effects of ethnicity, gender, marriage, and location on labor force participation in urban China." *Feminist Economics* 13 (3-4): 159–187.

Mudasiru, Surajudeen Oladosu. 2018. "Ethnicity and the voting pattern in Nigeria's 2015 general elections: The case of Lagos State." *Afr. J. Int'l Aff. & Dev.* 22: 1.

Nwodom, Destiny Uchenna, Chikaodiri Godwin Ukah, and Simon Ugochukwu. 2023. "Igbophobia and the Quest for National Cohesion in Nigeria: The 2023 General Elections in Perspective." *African Journal of Politics and Administrative Studies (AJPAS)* 16 (2): 142–155.

Oh, Suanna. 2023. "Does identity affect labor supply?" *American Economic Review* 113 (8): 2055–2083.

Okunogbe, Oyebola. 2024. "Does exposure to other ethnic regions promote national integration? Evidence from Nigeria." *American Economic Journal: Applied Economics* 16 (1): 157–192.

Paul, Mark, Khaing Zaw, and William Darity. 2022. "Returns in the Labor Market: A Nuanced View of Penalties at the Intersection of Race and Gender in the US." *Feminist Economics* 28 (2): 1–31.

Pearse, Rebecca, and Raewyn Connell. 2016. "Gender norms and the economy: Insights from social research." *Feminist economics* 22 (1): 30–53.

Weidmann, Nils B, Jan Ketil Rød, and Lars-Erik Cederman. 2010. "Representing ethnic groups in space: A new dataset." *Journal of Peace Research* 47 (4): 491–499.

A Supplemental Appendix (For Online Publication)

A.1 Additional Tables and Figures

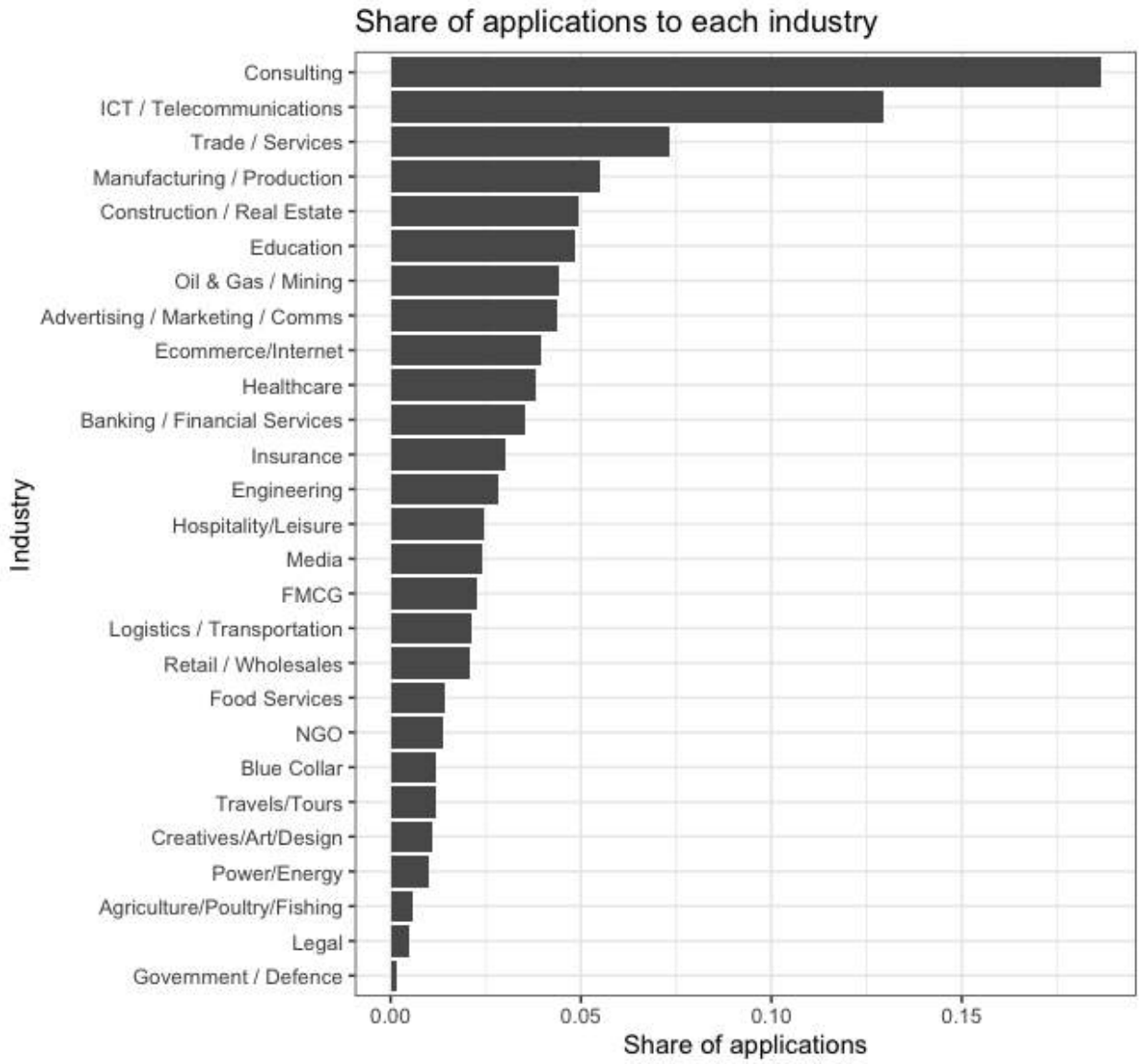


Figure A1: Industries represented on the Jobberman platform

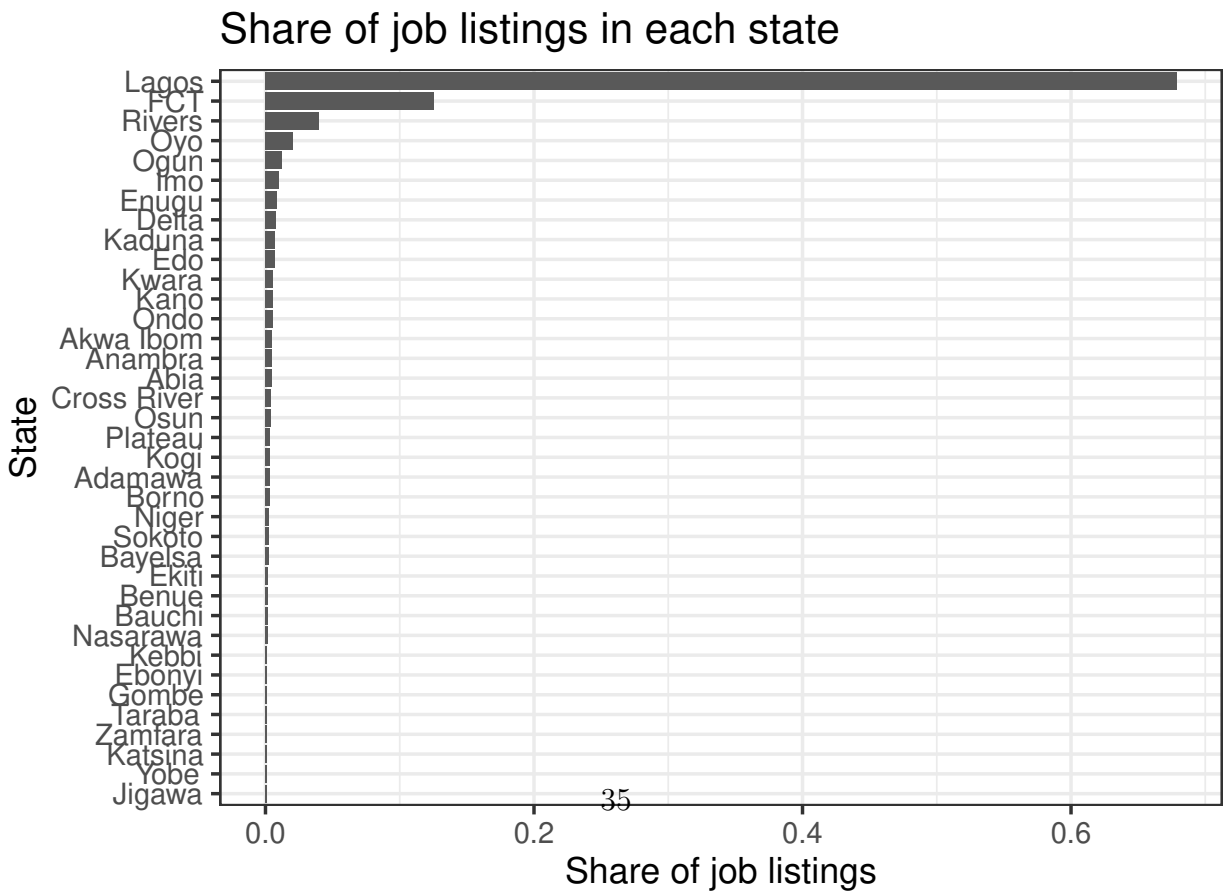


Figure A2: Share of online job listings in each state, 2016-2018

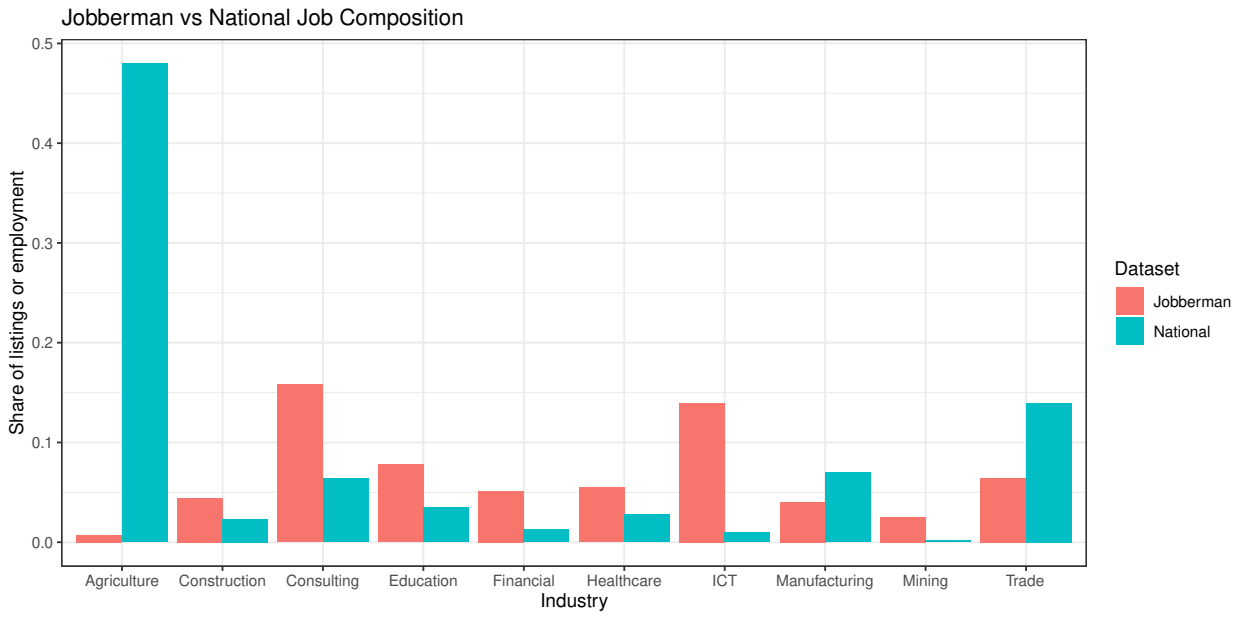


Figure A3: Top industries represented in online job market listings (Jobberman) vs national statistics (NBS), 2016-2018

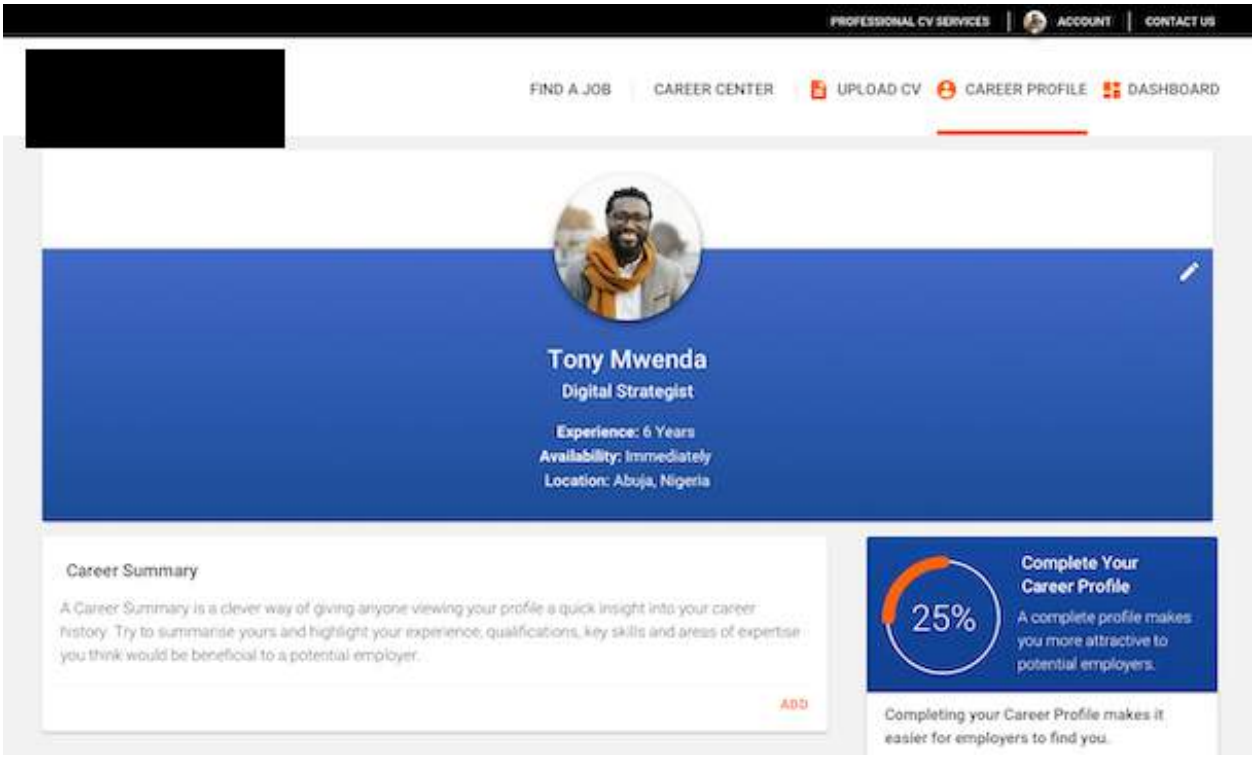


Figure A4: Example of a candidate profile on the online hiring platform

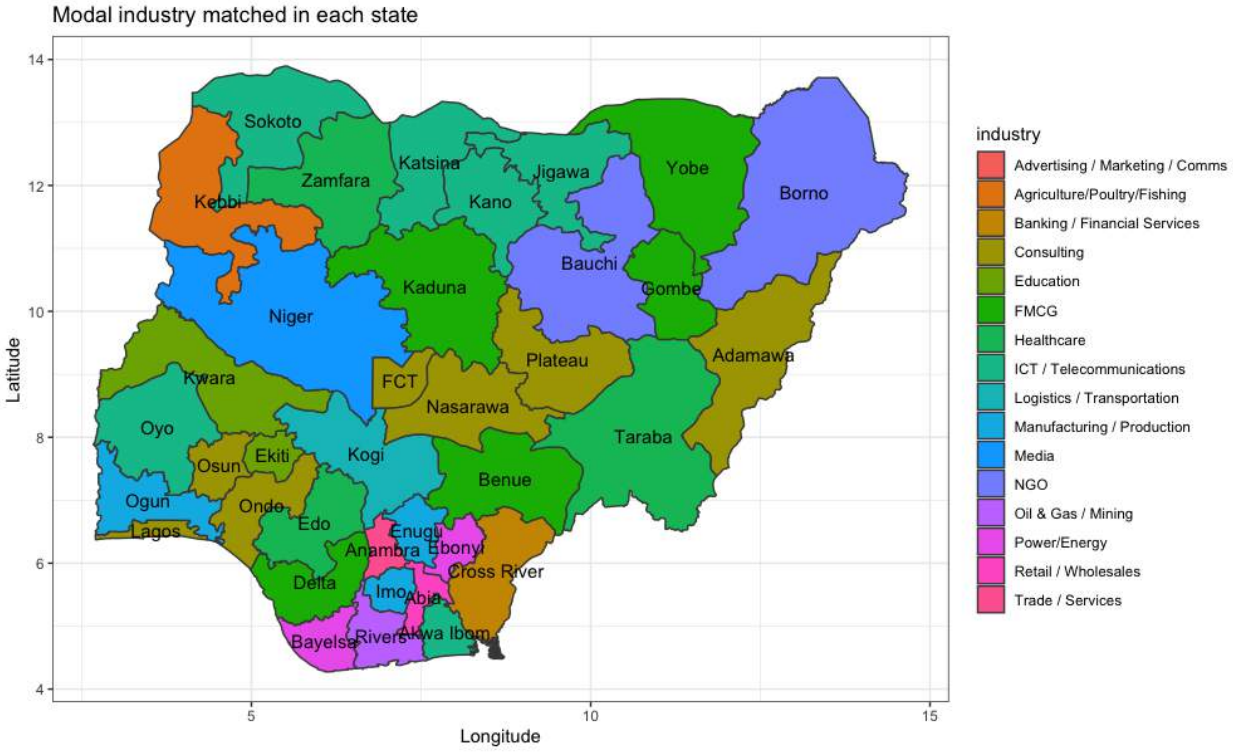


Figure A5: Map of Nigeria with modal industry by state shown, 2016-2018

Table A1: Differences in candidate characteristics by gender and ethnicity

Variable	Mean (Female)	Mean (Yoruba Female)	Mean (Igbo Female)	Mean (Hausa Female)	Mean (Bini Female)	Mean (Ibibio Female)
Age	29.18	29.05	29.49	28.88	29.48	29.14
Years of experience	3.66	3.69	3.52	3.15	3.78	3.43
Bachelor's degree	0.85	0.85	0.85	0.87	0.86	0.86
SME size	0.85	0.86	0.85	0.80	0.85	0.85
Senior level Job	0.66	0.65	0.66	0.64	0.66	0.65
Qualified education	0.92	0.92	0.91	0.91	0.92	0.93
Qualified YOE	0.93	0.93	0.93	0.89	0.93	0.92
Same Ethnicity Hiring Manager	0.35	0.54	0.24	0.05	0.05	0.02
Same Gender Hiring Manager	0.35	0.34	0.35	0.37	0.35	0.34
Variable	Mean (Male)	Mean (Yoruba Male)	Mean (Igbo Male)	Mean (Hausa Male)	Mean (Bini Male)	Mean (Ibibio Male)
Age	31.79	31.65	31.74	31.22	32.06	32.27
Years of experience	5.40	5.39	5.13	4.95	5.32	5.59
Bachelor's degree	0.78	0.77	0.80	0.75	0.77	0.75
SME size	0.84	0.85	0.84	0.78	0.84	0.83
Senior level Job	0.74	0.74	0.73	0.72	0.73	0.73
Qualified education	0.87	0.86	0.88	0.83	0.87	0.85
Qualified YOE	0.94	0.94	0.93	0.93	0.94	0.94
Same Ethnicity Hiring Manager	0.38	0.55	0.23	0.04	0.05	0.02
Same Gender Hiring Manager	0.67	0.67	0.66	0.65	0.66	0.67

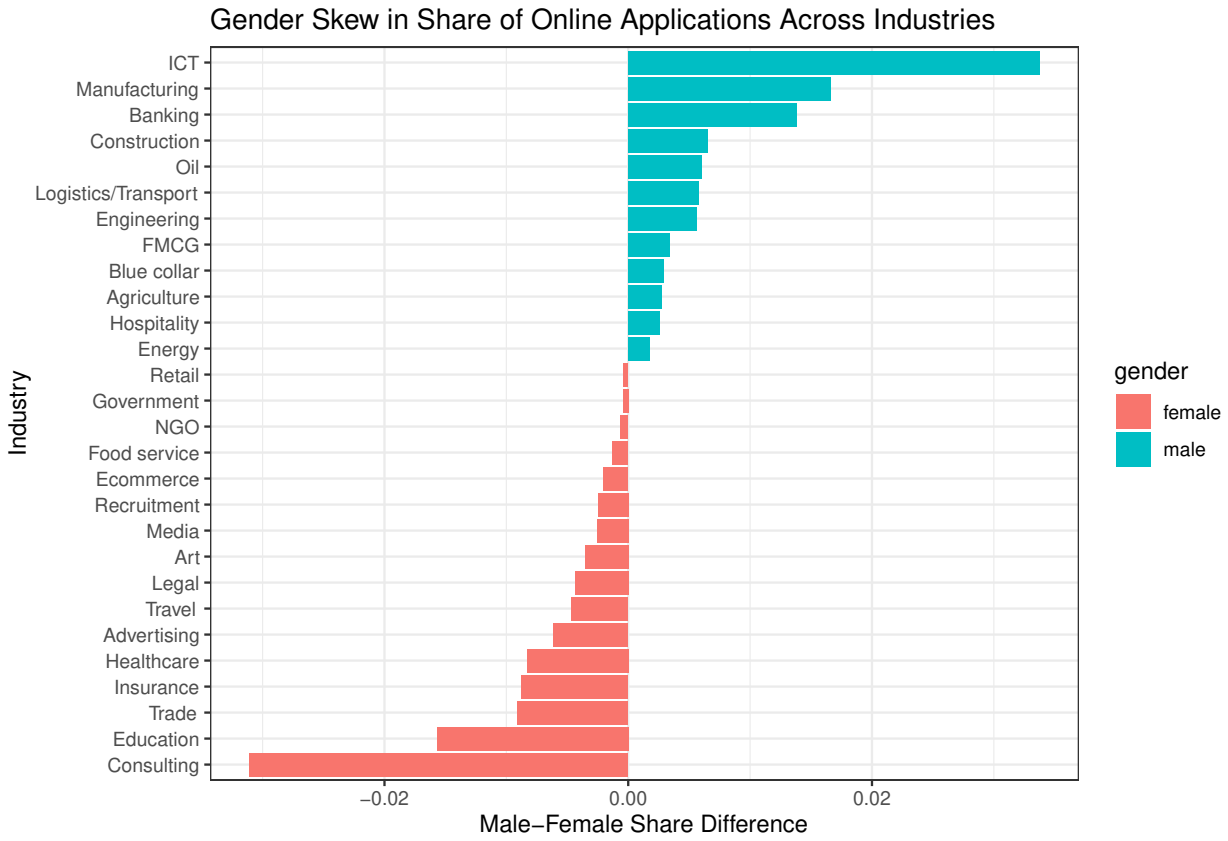


Figure A6: Gender skew in online applications by industry

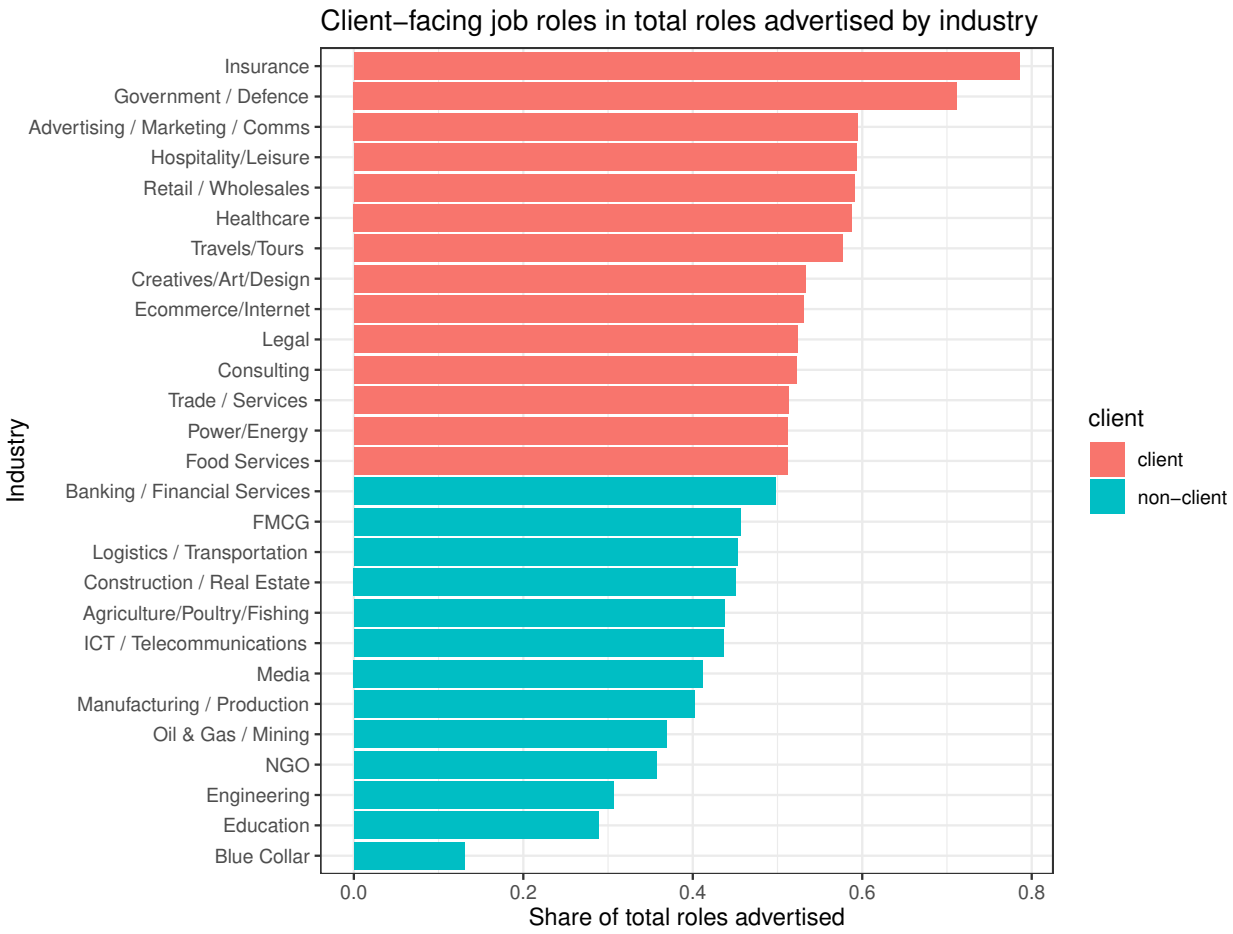


Figure A7: Client-facing roles as a share of total roles advertised by industry

Table A2: Effects of job applicant gender and shared ethnicity with the hiring manager on hiring outcomes

Outcome:	**Hired**			
Sample/Job Location:	All	All	Lagos	Lagos
	(1)	(2)	(3)	(4)
Female	−0.0001	0.001	−0.001	0.001
	(0.001)	(0.001)	(0.001)	(0.001)
Same Ethnicity	0.001	0.003**	0.002**	0.003***
	(0.001)	(0.001)	(0.001)	(0.001)
Female x Same Ethnicity		−0.004***		−0.004***
		(0.002)		(0.001)
Qualified Education	0.001***	0.001***	0.001***	0.001***
	(0.0004)	(0.0004)	(0.0004)	(0.0004)
Qualified YOE	0.001***	0.001***	0.001**	0.001**
	(0.0004)	(0.0004)	(0.0003)	(0.0003)
Mean of outcome	0.02	0.02	0.02	0.02
N	353,205	353,205	277,644	277,644
R^2	0.042	0.043	0.030	0.030
Joint F-test (p-value)		0.019		0.008
Candidate controls	Yes	Yes	Yes	Yes
Firm controls	Yes	Yes	Yes	Yes
Hiring Manager FE	Yes	Yes	Yes	Yes
Industry FE	Yes	Yes	Yes	Yes
Job Location FE	Yes	Yes	No	No
Year FE	Yes	Yes	Yes	Yes

Notes: Regressions estimated by OLS. Robust standard errors in parentheses clustered by candidate. Dependent variable is an indicator that equals one if the candidate was hired. Candidate controls include candidate age and level of candidate qualification for the job by education and years of experience. Firm controls include company size. Year FE is year of job posting fixed effects. Hiring manager is the firm's hiring manager. Job Location fixed effects are state fixed effects for the Nigerian administrative state (with an outside of Nigeria option) the job listing is located in. Joint F-test (p-value) is the test of joint significance from the OLS regression of the candidate being hired on the 'Same Ethnicity' and 'Female x Same Ethnicity' variables. ***Significant at the 1 percent level, **Significant at the 5 percent level, *Significant at the 10 percent level.

Table A3: Effects of job applicant gender and shared ethnicity with the hiring manager on hiring outcomes, LPM and Probit models

Outcome:	**Hired**			
Model:	LPM	LPM	Probit	Probit
	(1)	(2)	(3)	(4)
Female	−0.0001	0.001	−0.042	−0.006
	(0.001)	(0.001)	(0.040)	(0.045)
Same Ethnicity	0.001	0.003**	0.037	0.059**
	(0.001)	(0.001)	(0.024)	(0.027)
Female x Same Ethnicity		−0.004***		−0.114**
		(0.002)		(0.048)
Mean of outcome	0.02	0.02	0.02	0.02
N	353,205	353,205	340,158	340,158
Candidate controls	Yes	Yes	Yes	Yes
Firm controls	Yes	Yes	Yes	Yes
Hiring Manager FE	Yes	Yes	Yes	Yes
Industry FE	Yes	Yes	Yes	Yes
Job Location FE	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes

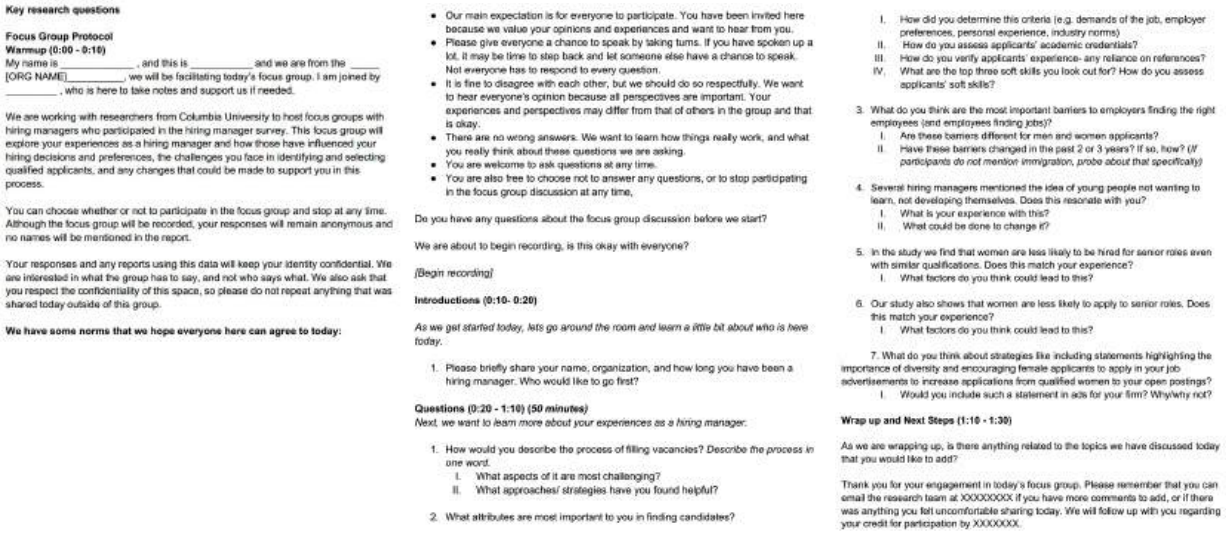
Notes: Regressions estimated by OLS. Robust standard errors in parentheses clustered by candidate. Dependent variable is an indicator that equals one if the candidate was hired. Candidate controls include candidate age and level of candidate qualification for the job by education and years of experience. Firm controls include company size. Year FE is year of job posting fixed effects. Hiring manager is the firm's hiring manager. ***Significant at the 1 percent level, **Significant at the 5 percent level, *Significant at the 10 percent level.

Table A4: Gender, ethnicity and gender equal attitudes

Outcome:	**Women Equal Rights**									
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Female	0.105***	0.105***	0.105***	0.105***	0.105***	0.101***	0.100***	0.121***	0.103***	0.105***
	(0.011)	(0.011)	(0.011)	(0.011)	(0.011)	(0.013)	(0.012)	(0.012)	(0.013)	(0.011)
Yoruba	−0.042*					−0.051*				
	(0.025)					(0.028)				
Igbo		0.020					0.005			
		(0.025)					(0.030)			
Hausa			−0.067***					−0.033		
			(0.025)					(0.029)		
Bini				0.019					−0.039	
				(0.054)					(0.076)	
Ibibio					0.076					0.063
					(0.065)					(0.074)
Female x Yoruba						0.018				
						(0.026)				
Female x Igbo							0.027			
							(0.029)			
Female x Hausa								−0.068**		
								(0.027)		
Female x Bini									0.109	
									(0.085)	
Female x Ibibio										0.030
										(0.075)
N	6,944	6,944	6,944	6,944	6,944	6,944	6,944	6,944	6,944	6,944
R^2	0.146	0.145	0.146	0.145	0.145	0.146	0.145	0.147	0.145	0.145
Individual controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
District FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year of birth FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Notes: Regressions estimated by OLS. Robust standard errors in parentheses. Women Equal Rights is an indicator that equals one if the respondent agrees with statement 1 "women should have equal rights and same treatment as men" over statement 2 "women should be subject to traditional laws" from the Afrobarometer rounds 1-6 and zero if the respondent disagrees with statement 1 and agrees instead with statement 2. Yoruba is an indicator that equals one if the respondent lists their home language or language of origin as Yoruba in the Afrobarometer survey. Individual controls include educational attainment. All regressions include district (local government area or LGA, the lowest administrative level of which there are 774 LGAs, in Nigeria), survey year and year of birth fixed effects. ***Significant at the 1 percent level, **Significant at the 5 percent level, *Significant at the 10 percent level.

A.2 Evidence from Hiring Manager Focus Group Interviews



Key research questions

Focus Group Protocol
Warmup (0:00 - 0:10)
My name is _____ , and this is _____ and we are from the _____ [ORG NAME]_____, we will be facilitating today's focus group. I am joined by _____ , who is here to take notes and support us if needed.

We are working with researchers from Columbia University to host focus groups with hiring managers who participated in the hiring manager survey. This focus group will explore your experiences as a hiring manager and how those have influenced your hiring decisions and preferences, the challenges you face in identifying and selecting qualified applicants, and any changes that could be made to support you in this process.

You can choose whether or not to participate in the focus group and stop at any time. Although the focus group will be recorded, your responses will remain anonymous and no names will be mentioned in the report.

Your responses and any reports using this data will keep your identity confidential. We are interested in what the group has to say, and not who says what. We also ask that you respect the confidentiality of this space, so please do not repeat anything that was shared today outside of this group.

We have some norms that we hope everyone here can agree to today:

- Our main expectation is for everyone to participate. You have been invited here because we value your opinions and experiences and want to hear from you.
- Please give everyone a chance to speak by taking turns. If you have spoken up a lot, it may be time to step back and let someone else have a chance to speak. Not everyone has to respond to every question.
- It is fine to disagree with each other, but we should do so respectfully. We want to hear everyone's opinion because all perspectives are important. Your experiences and perspectives may differ from that of others in the group and that is okay.
- There are no wrong answers. We want to learn how things really work, and what you really think about these questions we are asking.
- You are welcome to ask questions at any time.
- You are also free to choose not to answer any questions, or to stop participating in the focus group discussion at any time,

Do you have any questions about the focus group discussion before we start?

We are about to begin recording, is this okay with everyone?

[Begin recording]

Introductions (0:10- 0:20)

As we get started today, lets go around the room and learn a little bit about who is here today.

1. Please briefly share your name, organization, and how long you have been a hiring manager. Who would like to go first?

Questions (0:20 - 1:10) (*50 minutes*)
Next, we want to learn more about your experiences as a hiring manager.

1. How would you describe the process of filling vacancies? *Describe the process in one word.*
   I. What aspects of it are most challenging?
   II. What approaches/ strategies have you found helpful?

2. What attributes are most important to you in finding candidates?
   I. How did you determine this criteria (e.g. demands of the job, employer preferences, personal experience, industry norms)
   II. How do you assess applicants' academic credentials?
   III. How do you verify applicants' experience- any reliance on references?
   IV. What are the top three soft skills you look out for? How do you assess applicants' soft skills?

3. What do you think are the most important barriers to employers finding the right employees (and employees finding jobs)?
   I. Are these barriers different for men and women applicants?
   II. Have these barriers changed in the past 2 or 3 years? If so, how? (*If participants do not mention immigration, probe about that specifically*)

4. Several hiring managers mentioned the idea of young people not wanting to learn, not developing themselves. Does this resonate with you?
   I. What is your experience with this?
   II. What could be done to change it?

5. In the study we find that women are less likely to be hired for senior roles even with similar qualifications. Does this match your experience?
   I. What factors do you think could lead to this?

6. Our study also shows that women are less likely to apply to senior roles. Does this match your experience?
   I. What factors do you think could lead to this?

7. What do you think about strategies like including statements highlighting the importance of diversity and encouraging female applicants to apply in your job advertisements to increase applications from qualified women to your open postings?
   I. Would you include such a statement in ads for your firm? Why/why not?

Wrap up and Next Steps (1:10 - 1:30)

As we are wrapping up, is there anything related to the topics we have discussed today that you would like to add?

Thank you for your engagement in today's focus group. Please remember that you can email the research team at XXXXXXXX if you have more comments to add, or if there was anything you felt uncomfortable sharing today. We will follow up with you regarding your credit for participation by XXXXXXX.

Figure A8: Hiring manager focus group outline and questions

Figure A9: Word cloud of most frequently occurring nouns/words from focus group interviews with hiring managers in September, 2023 about experiences and challenges in filling vacancies, barriers to finding the right employees, including how this differs by applicant gender, and experiences around hiring women for senior roles in firms.

A.3 Evidence from Ondo and Anambra States

To further test the results of the conceptual framework in Section 3.2 we examine hiring manager behavior in 2 states: Ondo and Anambra. Ondo is a supermajority Yoruba region (89% Yoruba by 2003-2014 Afrobarometer survey averages) Yoruba and Anambra is a similarly high majority Igbo area (97%). These 2 states have high enough numbers of own groups and also are dominated by job listings in client-facing industries (consulting in Ondo and trade/services in Anambra), where, per the framework, costs from constraint (3) present a more significant constraint for hiring managers. The predictions of the framework state that, co-ethnic applicant preferences dominate, especially if you are within your own ethnic region, and that where patriarchal norms are stronger (e.g Yoruba areas), a female gender penalty will be enforced, with women less likely to be hired for positions, especially in senior roles. To assess the prediction that hiring manager behavior towards co-ethnic female applicants may change if they are ethnic minority y in a majority ethnicity x job location, and provide suggestive evidence that the predictions from Section 3.2 hold, we run Equation 1 in Ondo and Anambra states. The results are shown in Table A5. Yoruba managers in a Yoruba majority area like Ondo, act in accordance with the predictions, hiring more co-ethnic men and less women, with a larger (though imprecise) penalty for co-ethnic women, who make up the large majority of women applicants in a supermajority Yoruba area (column (1) and column (2) of the top panel). When Yoruba managers are in the minority, as in Anambra state, where they make up just 34% of managers, compared to 56% of Igbo managers, they are significantly more likely to hire co-ethnic female applicants (16pp more compared to co-ethnic male applicants, column (4) of top panel), following the predictions of the incentive to reduce the costs from constraint (2) in the framework.

Similarly, Igbo managers, who come from a group with relatively weaker patriarchal norms, are more likely to hire women applicants in their own regions (column (3) and (4) of

bottom panel). They are also significantly more likely to hire co-ethnic women when they are in a supermajority Yoruba area, following the predictions of the framework, to reduce the costs from constraints (2).

Table A5: Effects of job applicant gender and shared ethnicity with the hiring manager on hiring outcomes among Yoruba and Igbo hiring managers (HM) in Ondo (Yoruba) and Anambra (Igbo) states

Outcome:	**Hired**			
Sample :	**Yoruba Managers**			
Subsample/Job Location:	Ondo	Ondo	Anambra	Anambra
	(1)	(2)	(3)	(4)
Female	−0.073***	−0.040	−0.105*	−0.134*
	(0.026)	(0.035)	(0.059)	(0.069)
Same Ethnicity	0.041*	0.047*	−0.041	−0.076
	(0.025)	(0.029)	(0.045)	(0.049)
Female x Same Ethnicity		−0.041		0.164*
		(0.041)		(0.090)
Mean of outcome	0.08	0.08	0.06	0.06
N	440	440	89	89
R^2	0.165	0.165	0.191	0.201
Sample: :	**Igbo Managers**			
Subsample/Job Location:	Ondo	Ondo	Anambra	Anambra
	(1)	(2)	(3)	(4)
Female	0.014	−0.054	0.135*	0.033
	(0.070)	(0.046)	(0.074)	(0.049)
Same Ethnicity	0.070	−0.027	0.048·	0.039
	(0.081)	(0.032)	(0.032)	(0.033)
Female x Same Ethnicity		0.633*		0.126
		(0.362)		(0.093)
Mean of outcome	0.07	0.07	0.07	0.07
N	105	105	216	216
R^2	0.156	0.252	0.179	0.183
Candidate controls	Yes	Yes	Yes	Yes
Firm controls	Yes	Yes	Yes	Yes
Hiring Manager FE	Yes	Yes	Yes	Yes
Industry FE	Yes	Yes	Yes	Yes
Job Location FE	No	No	No	No
Year FE	Yes	Yes	Yes	Yes

Notes: Regressions estimated by OLS. Robust standard errors in parentheses clustered by candidate. Dependent variable is an indicator that equals one if the candidate was hired. Candidate controls include candidate age and level of candidate qualification for the job by education and years of experience. Firm controls include company size. Year FE is year of job posting fixed effects. Hiring manager is the firm's hiring manager. Job Location fixed effects are state fixed effects for the Nigerian administrative state (with an outside of Nigeria option) the job listing is located in. ***Significant at the 1 percent level, **Significant at the 5 percent level, *Significant at the 10 percent level. ·p-value= 0.129.

Table A6: Effects of job applicant gender and shared ethnicity with the hiring manager on hiring outcomes in Ondo (Yoruba) and Anambra (Igbo) states

Outcome:	**Hired**			
Sample/Job Location:	Ondo	Ondo	Anambra	Anambra
	(1)	(2)	(3)	(4)
Female	-0.060^{**}	-0.055^{*}	$0.064^{\cdot}$	0.006
	(0.025)	(0.030)	(0.043)	(0.046)
Same Ethnicity	0.046^{*}	0.047^{*}	0.023	0.004
	(0.025)	(0.027)	(0.027)	(0.028)
Female x Same Ethnicity		−0.007		0.140^{*}
		(0.043)		(0.086)
Mean of outcome	0.08	0.08	0.07	0.07
N	605	605	380	380
R^2	0.153	0.153	0.148	0.148
Candidate controls	Yes	Yes	Yes	Yes
Firm controls	Yes	Yes	Yes	Yes
Hiring Manager FE	Yes	Yes	Yes	Yes
Industry FE	Yes	Yes	Yes	Yes
Job Location FE	No	No	No	No
Year FE	Yes	Yes	Yes	Yes

Notes: Regressions estimated by OLS. Robust standard errors in parentheses clustered by candidate. Dependent variable is an indicator that equals one if the candidate was hired. Candidate controls include candidate age and level of candidate qualification for the job by education and years of experience. Firm controls include company size. Year FE is year of job posting fixed effects. Hiring manager is the firm's hiring manager. Job Location fixed effects are state fixed effects for the Nigerian administrative state (with an outside of Nigeria option) the job listing is located in. ***Significant at the 1 percent level, **Significant at the 5 percent level, *Significant at the 10 percent level. ·p-value= 0.138.

A.4 Hiring Information Experiment

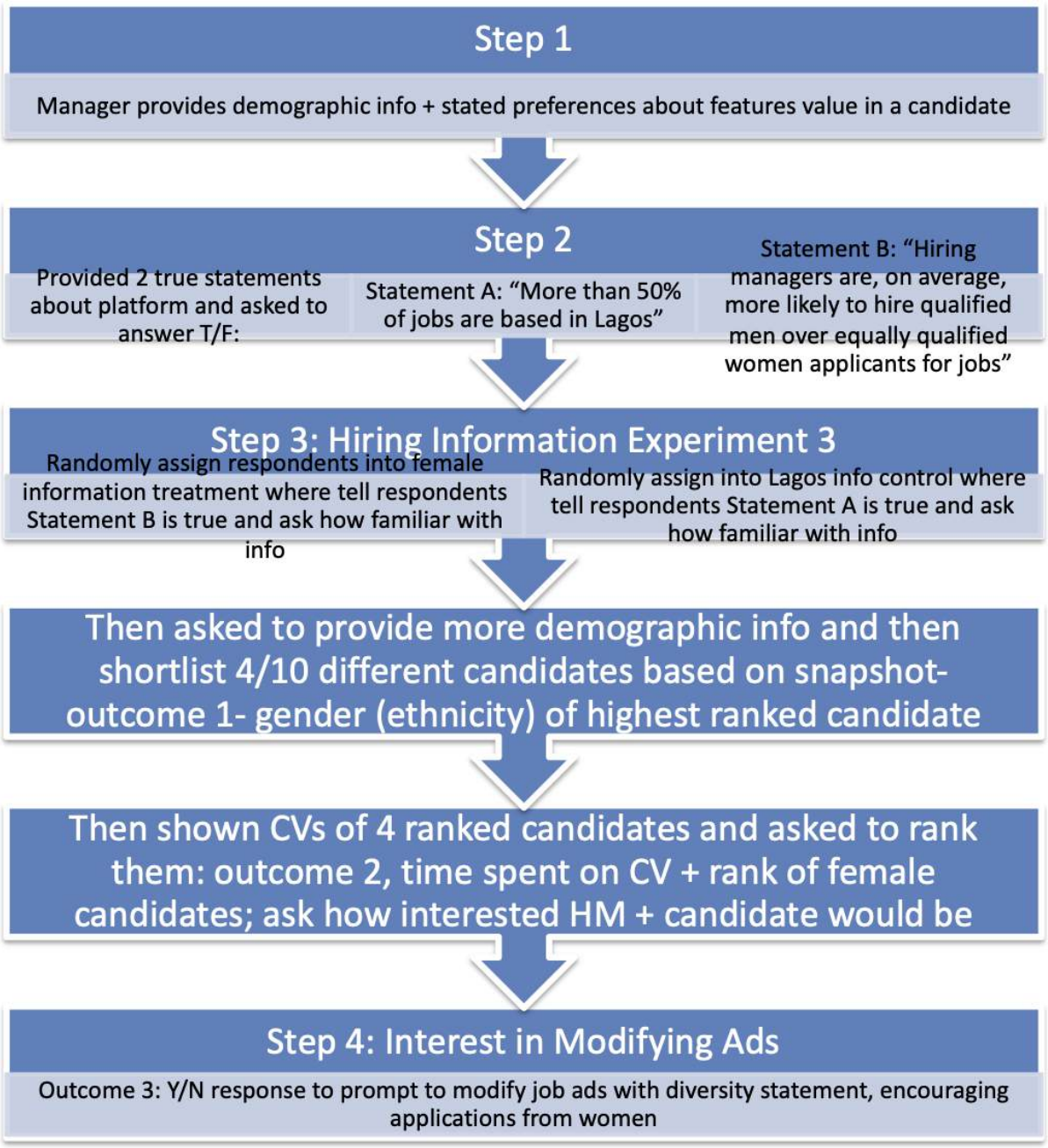


Figure A10: Experiment outline

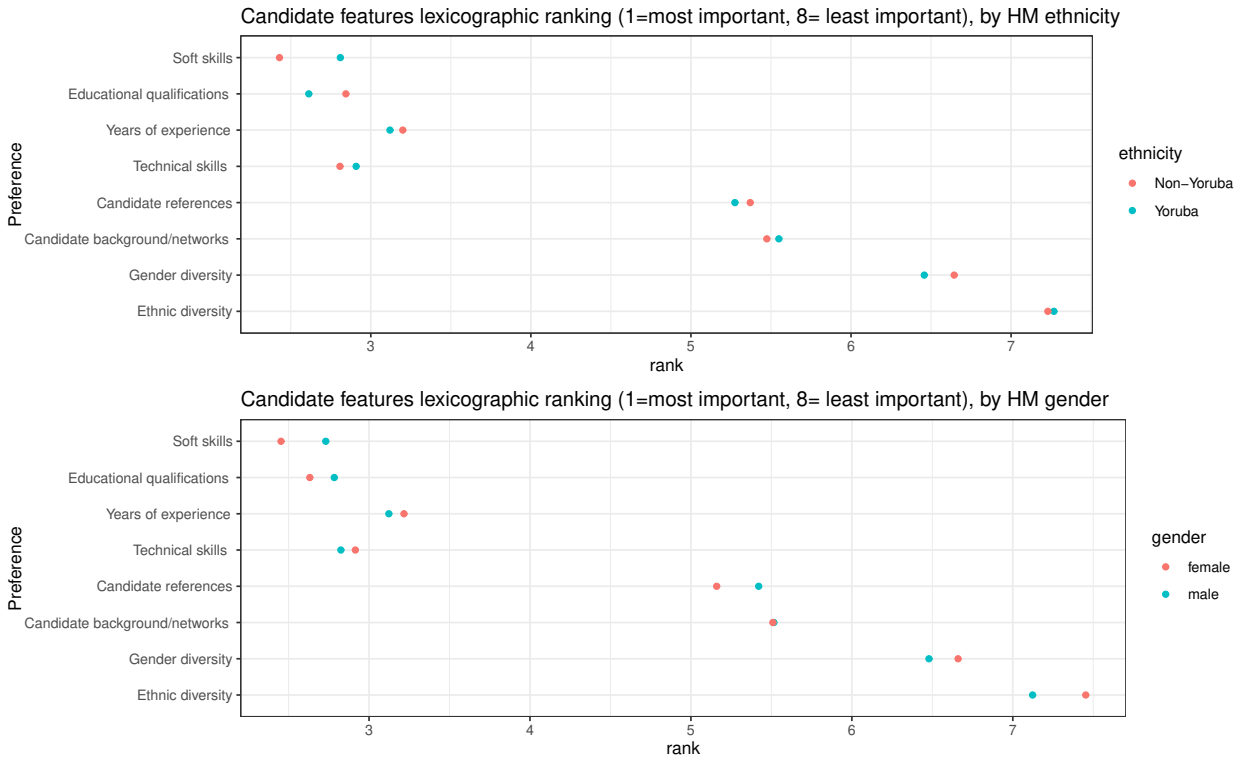


Figure A11: No ethnic and gender differences in hiring manager stated candidate preferences

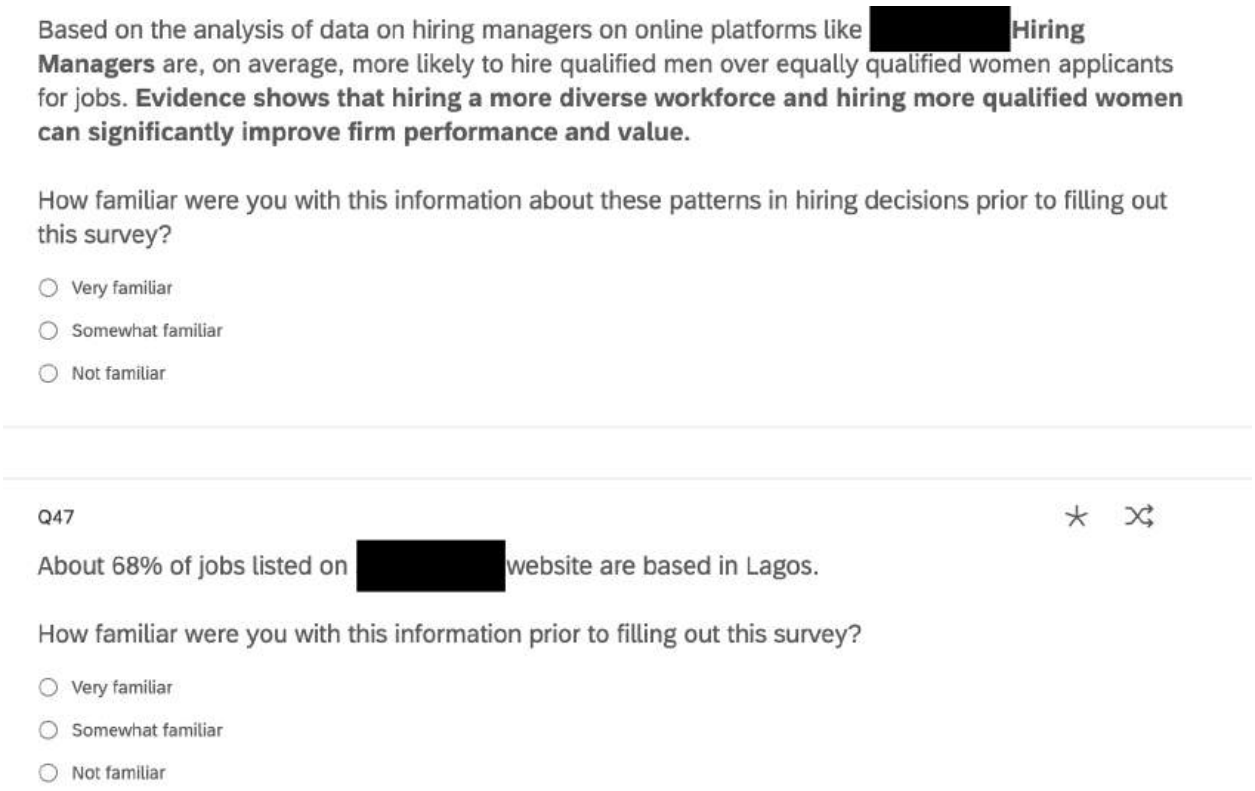


Figure A12: Hiring information intervention: Female information (Statement (top)) treatment and Lagos information control (Statement (bottom))

Figure A13: Short-listing candidate profiles for a senior position (IRR)

Funke Adebayo CV

FUNKE ADEBAYO

Lagos, Nigeria *234-808-819-9999* fadebyo_composite@email.com

ABOUT ME

Passionate about business analytics and data management. Productive and eager to contribute to team success with hard work, attention to detail and excellent organizational skills. Well experienced in business and technical management to deliver solutions to clients in a timely manner. 6 years of experience working with business data, customer service and analytics.

EDUCATION **University of Ibadan**
B.Sc. Hons in Business Administration and Management
MBA in Marketing and Entrepreneurship Management
National Youth Service Corps (NYSC), 2014

WORK EXPERIENCE

2019- Present **Senior Business Analyst, CloudCore Technologies,** Lagos, Nigeria
- Manage client solutions and teams to create value in Property, Mobile Banking Applications, Investment and Mortgage sectors
- Create and drive company's products vision, roadmap and business growth strategy
- Analyse data on trends and patterns for diagnostic and predictive analytics to drive value creation for businesses

2018- 2019 **Business Analyst/Project Manager, Innovatics,** Lagos, Nigeria
- Collaborated with programmers, engineers and organizational leaders to identify opportunities for process improvements and develop policies for data management
- Developed training materials for internal staff and program partners
- Prepared reports for executive leadership to efficiently communicate trends, patterns and predictions in the business environment using relevant data

2016- 2018 **Data Analyst, Aquaza Corporation,** Lagos, Nigeria
- Coordinated data collection and organization for every phase of business production chain
- Assessed and reported performance of digital marketing campaigns in relation to business goals (ROI and KPI)
- Identified trends and insights and optimized spending and performance based on insights

JOB SKILLS HTML, Proficient in Microsoft Office Applications, Data Analytics and Visualization, Product and Team Lead Management

Q94

This question lets you record and manage how long a participant spends on this page. This question will not be displayed to the participant.

Figure A14: Sample CV based on resumes of real applicants

Table A7: Summary statistics: Balance table and outcomes for treatment vs control samples, hiring manager information experiment

Variables	sample size	Mean	Control	Treatment	t-stat	p-val
Female	277	0.383	0.362	0.406	-0.746	0.456
Age	273	37.073	37.407	36.695	0.741	0.459
Years of experience	277	5.718	5.813	5.606	0.366	0.715
Highest education	277	6.531	6.521	6.542	-0.122	0.903
Salary category	277	10.590	10.735	10.425	0.668	0.505
Nos of dependents	277	3.603	3.752	3.43	1.123	0.262
Firm size	277	2.801	2.762	2.847	-0.406	0.685
Married	277	0.640	0.671	0.603	1.146	0.253
Ethnic majority	277	0.740	0.772	0.703	1.299	0.195
Yoruba HM	277	0.513	0.510	0.516	-0.092	0.927
Igbo HM	277	0.220	0.255	0.180	1.510	0.132

Notes: See text for details. Definitions of the variables are as follows: Highest Education: 1= vocational or high school degree, 2= Diploma, 3= OND (Ordinary National Diploma), 4= NCE (Nigeria Certificate in Education, 5= HND (Higher National Diploma), 6= Degree, 7= MBBS (Bachelor in medicine/surgery), 8= MBA/MSC, 9= MPhil/Phd; Ethnic Majority is an indicator that equals 1 if the candidate belongs to one of the three major ethnic groups- Yoruba, Igbo or Hausa. Salary category between 1 and 18, defined in Naira: "Less than N20,000"= "1", "N20,000 to less than N40,000"= "2", "N40,000 to less than N60,000"="3", "N60,000 to less than N80,000"="4", "N80,000 to less than N100,000"="5", "N100,000 to less than N120,000"="6", "N120,000 to less than N150,000"="7", "N150,000 to less than N180,000"="8", "N180,000 to less than N220,000"="9", "N220,000 to less than N260,000"="10" ,"N260,000 to less than N300,000"="11", "N300,000 to less than N350,000"="12", "N350,000 to less than N400,000"="13", "N400,000 to less then N500,000"="14", "N500,000 to less than N750,000"="15", "N750,000 to less than N1,000,000"="16", "N1,000,000 to less than N2,000,000"="17", "Above N2,000,000"="18". Firm size is a category between 1 and 7 : "Less than or equal to 10"="1", "11-25"="2","26-50"="3", "51-100"="4","101-200"="5", "201-500"="6", "501-1000"="7". Married is an indicator that equals 1 if the manager is married.

Table A8: Effects of hiring information treatment on Yoruba hiring manager incentivized resume rating (IRR) applicant hiring choice for unqualified candidates

Outcome:	Unqualified Yoruba M		Unqualified Yoruba F	
	(1)	(2)	(3)	(4)
Treatment	0.022	0.026	0.001	−0.001
	(0.034)	(0.057)	(0.011)	(0.004)
Yoruba HM	−0.067**	−0.063	0.015	0.013
	(0.033)	(0.043)	(0.010)	(0.013)
Treatment x Yoruba HM		−0.009		0.004
		(0.067)		(0.022)
Mean of outcome	0.051	0.051	0.005	0.005
N	248	248	248	248
R^2	0.062	0.063	0.057	0.057
Individual controls	Yes	Yes	Yes	Yes

Notes: Regressions estimated by OLS. Robust standard errors in parentheses. Treatment is an indicator for the hiring information treatment as described in text. Yoruba HM is an indicator that equals one if the hiring manager is Yoruba. Unqualified Yoruba F is an indicator that equals one if the hiring manager ranks the following applicant as their number 1 pick to hire for the senior analyst role: the unqualified (by education and experience listed in the job description for the role) candidate who is also female and Yoruba. Unqualified Yoruba M an indicator that equals one if the hiring manager ranks the following applicant as their number 1 pick to hire for the senior analyst role: the unqualified (by education and years of experience) Yoruba male candidate. Individual controls include age, gender, educational attainment, years of experience, marital status, and number of dependents of the hiring manager. ***Significant at the 1 percent level, **Significant at the 5 percent level, *Significant at the 10 percent level.

Table A9: Effects of hiring information treatment on Igbo hiring manager incentivized resume rating (IRR) applicant hiring choice

	Panel A: Choice of Top Qualified Female Candidates by Ethnicity					
Outcome:	Top Qualified Yoruba F		Top Qualified Igbo F		Top Qualified English F	
	(1)	(2)	(3)	(4)	(5)	(6)
Treatment	−0.058	−0.077	−0.010	−0.014	0.013	0.043
	(0.058)	(0.070)	(0.058)	(0.064)	(0.033)	(0.036)
Igbo HM	−0.261***	−0.296***	0.108	0.103	0.052	0.108*
	(0.060)	(0.078)	(0.079)	(0.100)	(0.045)	(0.063)
Treatment x Igbo HM		0.087		0.014		−0.140*
		(0.120)		(0.157)		(0.083)
Mean of outcome	0.258	0.258	0.246	0.246	0.051	0.051
N	248	248	248	248	248	248
R^2	0.091	0.092	0.084	0.084	0.025	0.036
	Panel B: Choice of Qualified Male Candidates by Ethnicity					
Outcome:	Qualified Yoruba M		Qualified Igbo M		Qualified English M	
	(1)	(2)	(3)	(4)	(5)	(6)
Treatment	0.018	0.022	0.016	−0.008	−0.004	0.023
	(0.023)	(0.029)	(0.027)	(0.030)	(0.028)	(0.029)
Igbo HM	−0.032**	−0.023	−0.003	−0.046**	0.060	0.109*
	(0.013)	(0.019)	(0.028)	(0.020)	(0.043)	(0.065)
Treatment x Igbo HM		−0.022		0.107		−0.122
		(0.031)		(0.075)		(0.085)
Mean of outcome	0.022	0.022	0.027	0.027	0.034	0.034
N	248	248	248	248	248	248
R^2	0.036	0.036	0.014	0.018	0.017	0.017
Individual controls	Yes	Yes	Yes	Yes	Yes	Yes

Notes: Regressions estimated by OLS. Robust standard errors in parentheses. Treatment is an indicator for the hiring information treatment as described in text. Yoruba HM is an indicator that equals one if the hiring manager is Yoruba. Top Qualified Yoruba F is an indicator that equals one if the hiring manager ranks the following applicant as their number 1 pick to hire for the senior analyst role: the most highly qualified (by education and experience listed in the job description for the role) candidate who is also female and Yoruba. Qualified Yoruba M an indicator that equals one if the hiring manager ranks the following applicant as their number 1 pick to hire for the senior analyst role: the less qualified (by education and years of experience) than the top qualified female candidates, but still qualified male, Yoruba candidate. Individual controls include age, gender, educational attainment, years of experience, marital status, and number of dependents of the hiring manager. ***Significant at the 1 percent level, **Significant at the 5 percent level, *Significant at the 10 percent level.

Table A10: Yoruba hiring managers responses to the hiring manager bias against women and jobs located in Lagos on the platform questions

Outcome:	Women Question	Lagos Question
	(1)	(2)
Yoruba HM	−0.086	0.049
	(0.063)	(0.041)
Mean of outcome	0.423	0.883
N	248	248
R^2	0.041	0.042
Individual controls	Yes	Yes

Notes: Regressions estimated by OLS. Robust standard errors in parentheses. Yoruba HM is an indicator that equals one if the hiring manager is Yoruba. Women Question is an indicator that equals one if the hiring manager answered the question of whether, based on the data on the hiring platform, 'hiring managers are, on average, more likely to hire qualified men over equally qualified women applicants for jobs' correctly. Lagos Question is an indicator that equals one if the hiring manager answered the question of whether, based on the data on the hiring platform, 'more than 50% of jobs are based in Lagos' correctly. Individual controls include age, gender, educational attainment, years of experience, marital status, and number of dependents of the hiring manager. ***Significant at the 1 percent level, **Significant at the 5 percent level, *Significant at the 10 percent level.