

The Impact of Employer Discrimination on Female Labor Market Outcomes

Experimental Evidence from Tunisia

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Abstract

The role of employer discrimination in widening labor market differences between men and women has been hypothesized and investigated in different settings. Using a field experiment, this paper examines the presence and magnitude of gender-based discrimination by employers at the point of screening in Tunisia. The study sent out 1,571 fictitious and substantially identical pairs of male and female resumes in response to online job advertisements. On average, women were 2.4 percentage points more likely than men to receive a callback from an employer. However, this average effect hides substantial heterogeneity across economic sectors. In the information technology sector, women were 15 percentage points less likely to receive a

callback than men. No discrimination against or in favor of women is found in engineering, whereas in marketing and finance, women were 19 and 4 percentage points more likely to receive a callback, respectively. The paper also finds that, unlike men, women may suffer from discrimination based on their physical appearance. Veiled women were 8.5 percentage points less likely to receive a callback than non-veiled women. Overall, the findings suggest that, at the point of screening, employer discrimination against women in Tunisia is sector specific, and, on its own, it cannot fully explain the complex challenge of female unemployment in the country.

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**The Impact of Employer Discrimination on Female Labor Market Outcomes:
Experimental Evidence from Tunisia**

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1. Introduction

Around the world, finding a job is much harder for women than it is for men. Similarly, finding a good-quality job and fair remuneration for it is also very challenging for women. The gender gap in the labor market is pervasive across both developed and developing countries. Eliminating it remains a development priority not only because it is a core development objective on its own, but also because of its far-reaching impact on enhancing productivity and boosting economic prosperity (World Bank 2012). Many hypotheses have been put forward to explain this gender gap, but they have not all been investigated equally, especially in different areas of the world. This study adds to the existing body of literature by examining gender-based discrimination in the Tunisian labor market.

In Tunisia, female students make up the majority (68 percent) of university graduates, and both female and male graduates join the labor market in comparable numbers. However, once in the labor market both groups do not have the same chances of finding a job. In 2014 the unemployment rate for university-educated women was 17 percentage points higher than that of their male counterparts. This puzzling and substantially large gender gap in unemployment could be explained by, among other things, discrimination in the labor market. One hypothesis is that a larger share of women are unable to find employment because of the discrimination by employers in the hiring process. An additional hypothetical consequence of discrimination, whether at the point of hiring, in terms of salary offers, or in promotions, is that a large share of women may pursue majors or apply for jobs with lower employment potential than men. Employers may believe that women's capacities are inherently inferior to those of men, or that a woman's present or future household and child-caring responsibilities will result in lower productivity than that of a male employee.

Study design

This paper uses a mixed-methods approach to studying gender-based discrimination in Tunisia's (high-skilled) labor market. It begins by qualitatively documenting the perception of discrimination on the labor supply side, and then experimentally examines the presence and magnitude of discrimination on the employers' (demand) side. Documentation of the perception of discrimination was conducted via focus group discussions with male and female students in

their last year of tertiary-level studies. The students represented the four main universities in the country's capital, Tunis. Over 75 percent of the students indicated that gender discrimination is important when they are considering their choice of major and occupation.

Despite this perception, gender discrimination may not be as prevalent in the labor market. The presence and magnitude of discrimination by employers at the point of entry were examined by conducting a correspondence field experiment—the first of its kind in the Middle East and North Africa (MENA) region. The experiment entailed sending fictitious and substantially identical male and female resumes in response to job advertisements. Any differences in callback rates could then be attributed to gender and thus interpreted as gender discrimination.

For this study, 1,571 pairs of fictitious resumes for males and females were submitted to employers. To ensure that the fictitious resumes were representative of Tunisian job seekers, the actual resumes of Tunisian university students were collected to construct a database of credible “productive characteristics” such as educational degrees, language proficiency, computer skills, internships, certifications, awards, and community life, as well as “nonproductive characteristics” such as hobbies. These characteristics were randomly assigned to each resume, ensuring that, on average, resumes were balanced across genders. Fictitious identities were then created and assigned to the resumes. These identities consisted of a common first and last Tunisian name, a cellphone number, an email address, a home address, and a photo (which customarily is included in Tunisian resumes).

Between May and September 2019, a pair of resumes was submitted in response to job advertisements in four fields—engineering, finance/economics, information technology (IT), and marketing—spanning 14 occupations through the two largest online job platforms in Tunisia, Tanit Jobs and Option Carrière. Together, the four selected fields captured around 95 percent of advertised vacancies and represented 47 percent of the selected fields of study of students enrolled in higher education in the country (table A.1).

The main outcome of interest was whether the employer called or emailed with the possibility of hiring (to ask for an interview or for additional information) or did not call back or called to reject the candidate. Two secondary outcome indicators were also examined: the type of positive employer response—indicates willingness to hire immediately, requests an interview over the

phone on the spot, requests an in-person interview at a later date, or requests additional information—and the average response time from the time of the application.

Study findings

The study finds that, on average, there is positive discrimination in favor of women by employers at the point of entry—that is, for the overall sample female candidates are about 2.4 percentage points more likely than male candidates to receive a callback from an employer. In other words, at this point female candidates have an approximately 10 percent advantage over male applicants.

However, this average effect hides substantial heterogeneity across fields. Depending on the field, the results reveal discrimination in favor of women, discrimination against women, or no discrimination. In the IT field, females and males with similar credentials do not have an equal chance of employment. Just at the point of entry, females are 15 percentage points less likely to receive a callback from an employer, and web design and web development are the two specific IT occupations in which discrimination is the most prevalent. This finding may explain why the unemployment rate for female graduates is 36 percentage points higher than that of their male peers in the Tunisian IT sector. By contrast, females benefit from positive discrimination in the marketing field. Males are 22 and 27 percentage points less likely than females to receive a callback for assistant marketing and marketing specialist occupations, respectively. Similarly, although substantially smaller, the study finds positive discrimination in the finance and economics fields, where females are 3.5 percentage points more likely than males to receive a callback. Finally, the study finds no discrimination against females in male-dominated engineering occupations, even as the actual unemployment gap in this field reached 48 percentage points in 2014.

The study also suggests that, unlike men, women can suffer from discrimination based on their physical appearance, which is likely related to the strength of their religious beliefs and practices. Specifically, veiled women are, on average, 8.5 percentage points (30 percent) less likely to receive a callback than nonveiled women.

The findings do not rule out that women may also face discrimination at the interview stage. They are more likely by 9 percentage points to be asked for an in-person interview at a later stage,

whereas men are more likely by 10 percentage points to receive an interview on the spot over the phone.

Beyond hiring, women face wage discrimination in employment. Use of the Blinder-Oaxaca decomposition method reveals that the observed wage gap is not explained by higher human capital endowments and is mostly due to higher premiums or higher returns that men receive on their endowments compared with women. Wage discrimination is particularly pronounced in higher-paying jobs.

The results of the study suggest that discrimination is an important factor in why female graduates fall behind their male peers in the labor market, only in certain occupations. Even in those occupations in which positive discrimination or no discrimination exists, other binding constraints to female employment still exist.

This paper is structured as follows. The description of the Tunisian labor market in section 2 is followed in section 3 by an examination of the constraints to employment among educated women in Tunisia. Section 4 then focuses on gender discrimination as an explanatory factor in high female unemployment in Tunisia and presents original qualitative data on the perception of discrimination among Tunisian university students. Section 5 describes the experimental design of this study, and section 6 presents the main empirical strategies and results on gender discrimination in the labor market. Section 7 further analyzes the extent to which additional features can influence such discrimination. Section 8 then looks at gender discrimination beyond the point of entry. Study limitations and potential avenues for future research are examined in section 9, which is followed by our conclusions in section 10.

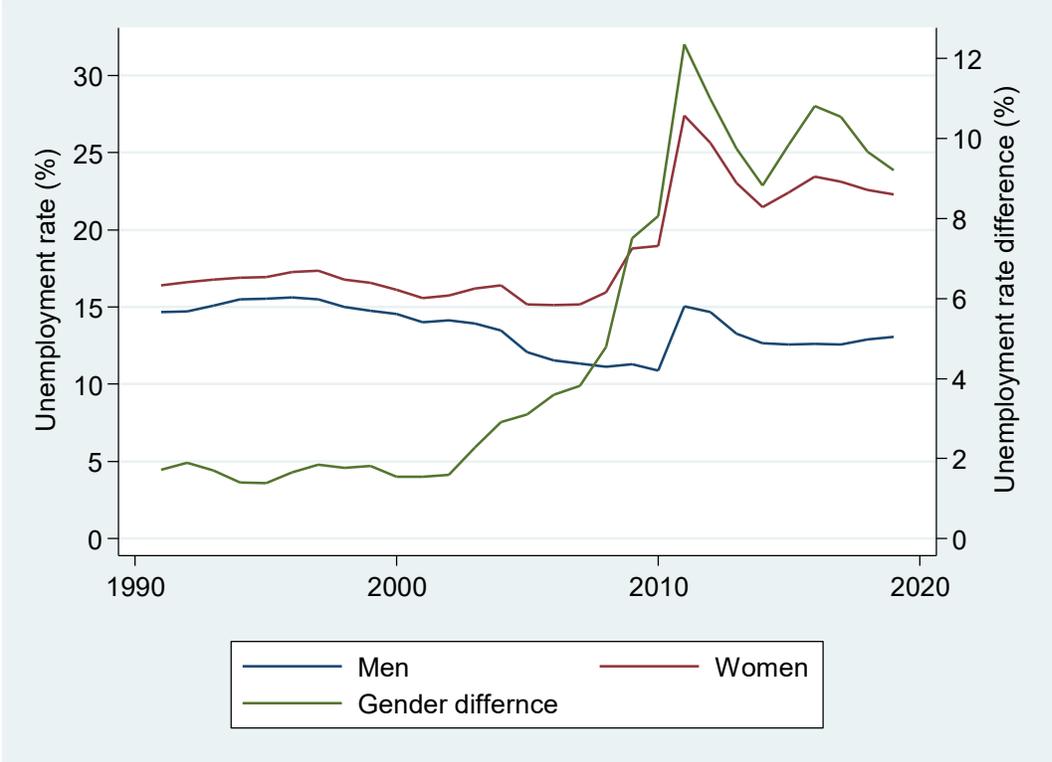
2. Context: The Tunisian labor market and the gender gap

The Tunisian labor market is characterized by a significant gap in outcomes between males and females. Over the last two decades, the labor force participation rate of males averaged 75 percent, whereas the rate for females averaged 25 percent. Although in Tunisia the rate for females is higher than the MENA average of 20 percent, it remains significantly lower than the world average of 48 percent.

Furthermore, among those participating in the labor market females are disproportionately more likely to be unemployed than males (figure 1). Much of the unemployment gender gap began

shortly after 2001 and peaked at the end of the decade. The advent of the Arab Spring in 2011 put significant downward pressure on both males and females, but between 2015 and 2020 the gap stabilized to between 10 and 11 percentage points.

Figure 1 Unemployment rates by gender: Tunisia, 1990–2019

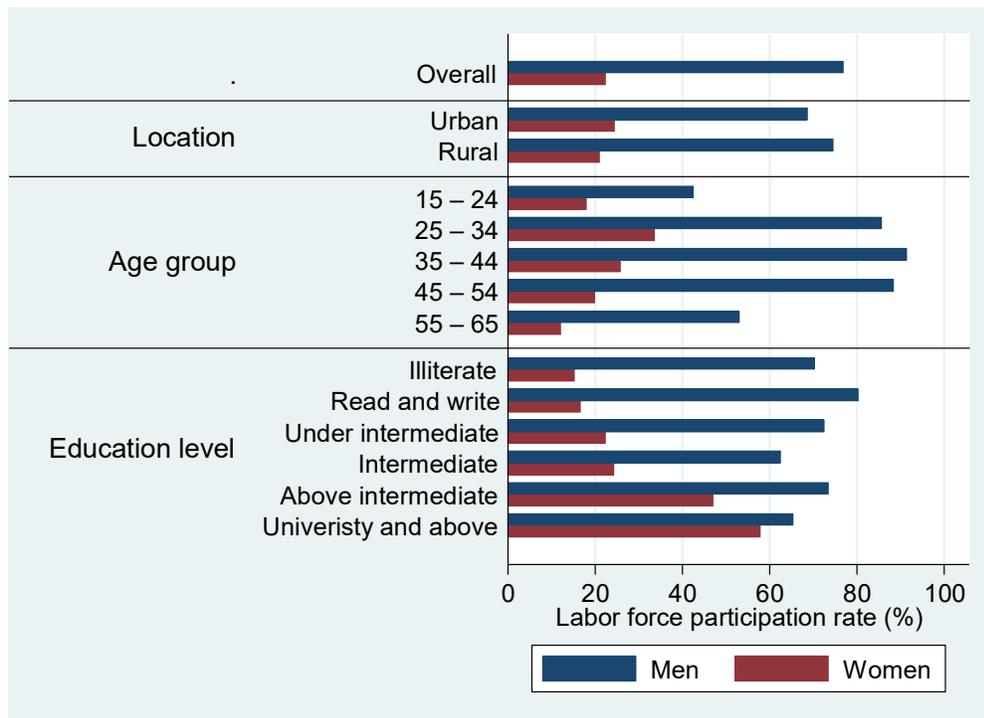


Sources: Modeled estimates, International Labour Organization (ILO); World Bank, World Development Indicators (WDI), 2019, <https://databank.worldbank.org/source/world-development-indicators>.

Aggregated averages often mask important and substantial variations. Features such as age, education, and location can provide a more nuanced picture of the key characteristics of men and women that are likely to influence their decision to enter the labor market and subsequently find employment. For example, women in urban areas are more likely than women in rural areas to participate in the labor market. In addition, women in the 25–33 age group have the highest labor force participation rate (34 percent) of all age groups. However, this rate drops beyond this age group, possibly following marriage. By contrast, men’s labor force participation rates remain high across age groups and only drop for the 55–65 age group (figure 2).

In addition to age and location, education plays a strong role in influencing women’s labor market participation. Although a larger share of men than women at every level of education participate in the labor market, the “labor force participation–education nexus” is stronger for women than for men (figure 2). In other words, as their level of education rises, female participation in the labor market increases substantially (from 24 percent for those with intermediate education to 58 percent for those with university degrees). By contrast, there is no discernible trend for men.

Figure 2 Labor force participation rate by gender, location, age, and education: Tunisia, 2014



Source: Tunisian Labor Market Panel Survey (TLMPS), 2014, <http://www.erfdataportal.com/index.php/catalog/105>.

The labor force participation–education nexus for women is important because in recent decades Tunisia has achieved major gains in educational attainment for women. For example, between 2003 and 2017 the gross tertiary enrollment for women increased from 30 percent to 42 percent, whereas for men the gross tertiary enrollment remained constant at 23–24 percent during the same

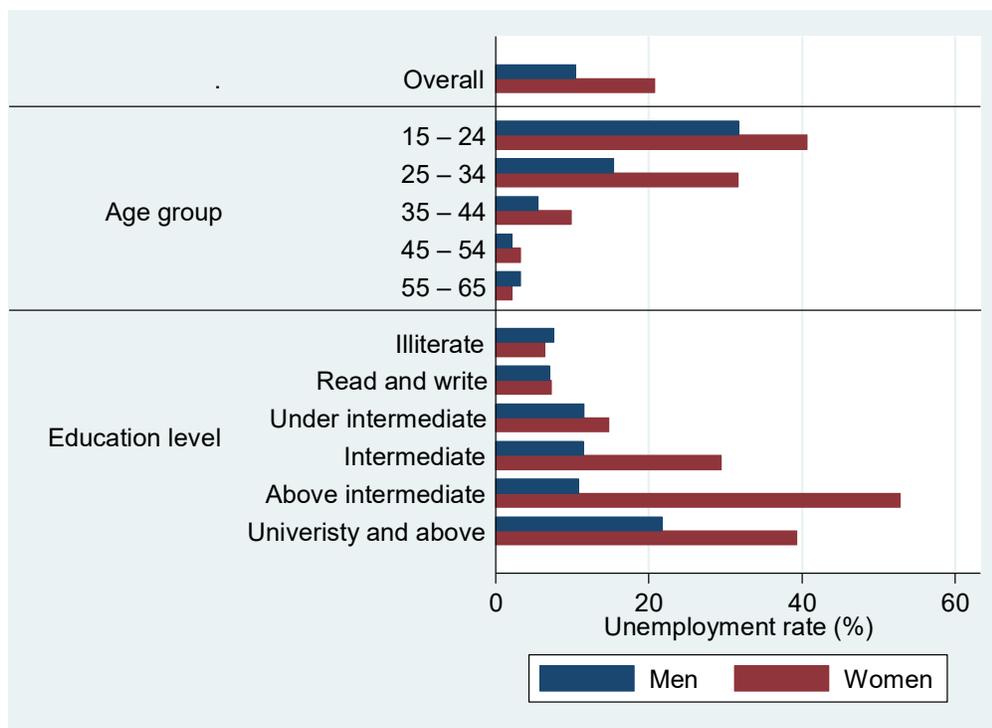
period.¹ In the 2018 academic year, of the 272,261 students enrolled in public and private universities in Tunisia, 63 percent were women.

Many Tunisian women who finish their tertiary education join the labor market. As noted, the labor force participation rate for this group of women was 58 percent in 2014. Tertiary-educated men joined in comparable numbers, albeit at a higher rate of 65 percent.

However, even for those entering the labor market there is a substantial gender gap, which is the focus of this study. Once in the labor market, both groups do not have equal job opportunities. For example, in 2014 the unemployment rate for university-educated women reached 39 percent, whereas it was 22 percent for their male counterparts. The discrepancy is even starker when looking at female unemployment in rural areas and by age in 2014: 32 percent of active women between the ages of 25 and 34 are unemployed versus 15 percent of men in that age group. In rural areas, 21 percent of women are unemployed, compared with 10 percent of men. According to data from the National Institute of Statistics (Institut National de la Statistique), women accounted for around 25 percent of employment in 2013, down from 26.5 percent in 2005 (Mouelhi and Goaiied 2017). Therefore, although unemployment among the young and university-educated is stubbornly high—and remains higher than that for other groups such as older workers and those with lower education—women remain more disadvantaged than men (figure 3).

Figure 3 Unemployment rate by gender, age, and education: Tunisia, 2014

¹ World Bank, World Development Indicators (WDI), 2019, <https://databank.worldbank.org/source/world-development-indicators>.



Source: Tunisian Labor Market Panel Survey (TLMPS), 2014, <http://www.erfdataportal.com/index.php/catalog/105>.

3. Constraints to employment among educated women in Tunisia

This paper focuses on the barriers faced by highly educated women in the Tunisian labor market. This is an important and puzzling group because, as described earlier, although female and male Tunisian university graduates exhibit similar labor participation rates, female unemployment is persistently higher than male unemployment in this highly educated cohort. But any further discussion of the role of gender-based discrimination in producing this gap must be prefaced by a brief description of the other important constraints and challenges facing educated women in the labor market.

In recent years, the Tunisian labor market has been characterized by two trends: an increasing supply of highly skilled labor and yet a stagnant economy that has been unable to increase its demand for labor at the same rate as the increase in supply.

From 1994 to 2004, the number of university graduates from public institutions in Tunisia grew at an annual rate of 12 percent—a rate five times higher than the growth rate of the working-age population (Assaad, Ghazouani, and Krafft 2017). This dramatic shift in the educational composition of new labor market entrants in Tunisia was coupled with the continued growth of

the youth and young adult population. The shape of Tunisia's demography in 1994 was characterized by the clear signs of a youth bulge, as depicted by the largest share of the population ages 5–9 and 10–14.² In the intervening 20 years, and thanks in large part to a decline in fertility rates, this bulge transitioned to the 25–29 and 30–34 age groups (Assaad, Ghazouani, and Krafft 2017).

The pressure created by this new labor supply was not matched by an increase in the number of formal jobs that matched the qualifications and expectations of educated workers. Weak economic growth limited job creation in the formal private sector, which in turn was too low to absorb new entrants to the labor market. Because of the delays in implementing reforms after the 2011 revolution, as well as security-related incidents, social unrest, and regional instability (including in neighboring Libya), economic growth has averaged only 1.4 percent since the revolution (compared with 4.4 percent during the five previous years). The entry rate for the small firms that create formal sector jobs has been low, and, of those firms created, only a few have been able to survive and grow (World Bank 2017). As a result, a majority of those who do work are in low-productivity and low-quality jobs. Indeed, as much as 77 percent of Tunisia's workforce is employed in low-productivity sectors,³ while high-productivity service sectors have absorbed only 7.7 percent of total employment.

Important for this study is that the pressure on the labor supply is particularly acute for women, whose ranks among graduates have been growing at a faster rate than those of men. In 2013 women made up 67 percent of higher education graduates, and that share persisted at 65 percent in 2017. Assaad et al. (2018) argue that the lack of increase in opportunities in the formal private sector has disadvantaged women more than men. This is especially true for educated women for whom informal or nonwage employment is not a viable option. Women's higher reservation wages⁴ mean they are more able and likely to remain unemployed until they can locate good-quality jobs that match their expectations (Assaad and Kraftt 2016).

² A youth bulge is a common phenomenon in many developing countries and is typically the outcome of a reduction in infant mortality and a stability in fertility rates.

³ *Low-productivity sector* refers to those with below-average productivity such as agriculture, textile, construction, public infrastructure, commerce, and manufacturing (see World Bank 2015a).

⁴ A reservation wage is the lowest wage rate at which a worker would be willing to undertake a particular kind of job.

In 2014 the majority of educated women in Tunisia were from wealthier households, whereas only 15 percent of women who had a university degree belonged to households in the low wealth quintiles (Hanmer, Tebaldo, and Verner 2017). Tunisian educated women, especially married ones, report strong preferences for working in the public sector, where workdays are shorter, jobs are more secure, and maternity benefits are more generous. However, a decline in recruitment in the public sector most likely has resulted in a lack of job opportunities for educated women (Mouelhi and Goaid 2017). Women’s preferences for public sector employment also likely stem from the skills mismatch between their major area of study and what is demanded by employers in the private sector. Data on enrollment by major at universities in Tunisia (see the appendix) show a gender divide in which a larger share of women are concentrated in fields that tend to have lower employment and wage potential. In 2018, for example, 85 percent of students studying education were female, and 71 percent of students enrolled in the social services major were female. By contrast, only 39 percent of engineering students were female.

The lack of job opportunities is severer in Tunisia’s lagging regions than in its leading regions.⁵ There, young women are often more geographically constrained than young men and are not able to relocate as easily to take advantage of economic opportunities. Assaad, Ghazouani, and Krafft (2017) argue that educated young women are more likely to be “trapped” by the opportunities available in their local labor markets, which may not correspond to their educational qualifications. These challenges are evident in the very high unemployment rates experienced by educated young women in rural areas and lagging regions. In 2014 more than one in three women were unemployed compared with approximately one in seven men in these lagging regions. In addition, rural females with a short-cycle university education⁶ have an unemployment rate of close to 80 percent. The rate for long-cycle rural female university graduates is only slightly lower at almost 60 percent (Assaad, Ghazouani, and Krafft 2017).

Economic opportunities in the lagging regions are mostly concentrated in the low-productivity agriculture sector. Self-employment and unpaid family work alone provide more than a quarter of

⁵ Tunisia is organized into 24 governorates that can be aggregated into seven administrative regions; Greater Tunis, North East, and Centre East are considered leading regions and North West, Centre West, South East, and South West are considered lagging regions. On average, lagging regions have higher poverty rates, lower consumption rates, and fewer economic opportunities than leading regions (World Bank 2015b).

⁶ In Tunisia, since the 2006/07 school year higher education is structured as follows. The first diploma (*license*) is obtained after two to three years of higher education (short cycle). Students who continue their higher education studies for another two years (long cycle) obtain a master’s diploma (Assaad and Boughzala 2018).

employment. Over half of employed women state that working as unpaid workers on family farms is their primary occupation (Hanmer, Tebaldo, and Verner 2017). Limited efforts are currently underway to increase productivity in agricultural value chains and to expand job opportunities in those regions, particularly for educated women.

Other barriers that could explain the discrepancy in labor market outcomes are gender-based time constraints. In particular, women face time constraints due to domestic work and childcare responsibilities, which in turn are an important driver explaining women's strong preference for public sector jobs. For example, Hanmer, Tebaldo, and Verner (2017) and Assaad, Ghazouani, and Krafft (2017) find that being married increases the probability of being employed for men but decreases it for women. Hanmer, Tebaldo, and Verner (2017) also show that in the leading regions, two-thirds of women do not participate in the labor market because of household responsibilities. In the lagging regions, women spend over 20 hours a week on household work, regardless of whether they are employed or out of the labor force. By contrast, men only dedicate a small fraction of their time to household work.⁷

Finally, other constraints, such as financial ones, can also differentially affect women. Even though women in Tunisia have equal ownership rights to property, in practice few women own land or other material assets, and most assets are registered in the husband's or father's name. These property issues make access to finance more difficult for new ventures (World Bank 2017). This situation is important because, given the lack of wage opportunities, entrepreneurship could be considered one viable option for educated workers. However, a recent assessment found that entrepreneurship education offered to university students led to only a temporary increase in business ideas but no sustained impact on self-employment or employment outcomes four years after graduation. In fact, a large share of graduates report financial constraints as the most prevailing barrier to entrepreneurship (Alaref, Broadmann, and Premand 2020), thereby demonstrating how even entrepreneurship is not a viable option for most educated women.

⁷ Hanmer, Tebaldo, and Verner (2017) estimate that women who spend more than 40 hours a week doing household work are about 5 percent less likely to be employed than those who devote fewer hours to household work.

4. Employer discrimination in the labor market

The previous section outlined several structural and systemic challenges faced by educated women trying to enter the Tunisian labor market—challenges that are likely explanations for why female unemployment is persistently higher than male unemployment among university graduates. This section addresses a fundamental and prominent additional explanation: gender-based discrimination in the labor market. Discrimination by employers in certain fields or sectors could translate into higher female unemployment. It could also result in segregation in low-skilled and low-productivity sectors. Discrimination may also deter young female students from pursuing male-dominated majors of study at the tertiary level and instead pursue majors with limited absorptive capacity, thereby reinforcing the gender gap.

Theories on gender-based employer discrimination

But why would employers discriminate on the basis of gender? Before moving to the empirical analysis, a brief look at the extant theories and recent evidence surrounding gender-based employer discrimination would help to answer this question.

On the theoretical front, two canonical economic theories of discrimination seek to address this question. First, taste-based models, advanced by Gary Becker (1957), argue that discrimination reflects the prejudice, or “taste,” of members of the majority or dominant group—such as men—against those from a minority group—such as women. Some employers simply have a distaste for hiring women, or if they do hire them, they show such distaste by paying them less than male employees with the same level of skills. However, taste models predict that, under some conditions of market competition, discriminating employers will be phased out of the market, and so the gender wage gap will be eliminated. However, the persistence of discrimination, and wage gaps for that matter, implies that taste-based models cannot fully explain employer-based discrimination.

A second prominent economic theory is statistical discrimination. It asserts that employers lack information about job applicants when hiring, and one way to address this issue is to use observable characteristics, such as gender, to proxy for unobservable ones, such as skills or turnover propensity—see, for example, Arrow (1973) and Phelps (1972). For this to occur, employers have to believe that, say, female applicants are, on average, less productive than male applicants.

Although these beliefs, or “stereotypes,” may be held only on average, they would result in applicants from one group being treated differently than applicants from the other group, *even though* they possess the same skills and potential productivity. Furthermore, these models, along with research in social psychology, claim that these beliefs and stereotypes may be self-confirming—that is, when certain groups are stereotyped as less productive, these groups will become less productive because the payoff from investing in skills may depend on employers’ beliefs that likely—and arbitrarily—disregard such investments.

Finally, recent research in psychology suggests that the underlying source of prejudice is rooted in social identity. When a group is part of the social identity, in-group members may be favored, and out-group members can suffer from negative evaluations, even if these groups are completely arbitrary ones. Similar research suggests the existence of unconscious and unintentional biases triggered by exposure to out-group members. In all these arguments, socialization and social norms are the ultimate drivers of discrimination.

Although these theories attempt to offer explanations as to why one might see employer-based discrimination, compiling empirical proof that such discrimination exists is no easy task (see Bertrand and Duflo 2016). For example, earlier studies of discrimination simply regressed different individual-level outcomes on a “minority group” indicator and a host of other covariates as controls. It is now well known that interpreting the estimate of the “group” variable as discrimination is vulnerable to omitted variable bias, among other concerns, which would lead to biased estimates of the variables of interest. To address these limitations, two experimental methodologies have been used: audit and correspondence studies.

In *audit studies*, pairs of individuals, often called auditors or testers, are matched—and trained—so that all relevant characteristics other than the one being investigated (such as gender) do not vary. The pair then applies for the job, and the entire job search experience, which contains a wealth of qualitative information, is carefully documented and analyzed. A study by Neumark, Bank, and Van Nort (1996) is the canonical example. Comparably matched pairs of men and women applied for jobs as waiters and waitresses at 65 restaurants in Philadelphia. The study found discrimination against female applicants in high-priced restaurants, but also discrimination in favor of female applicants in low-priced restaurants. Papers with audit-style research designs have found similar mixed results. Goldin and Rouse (2000) studied gender discrimination in hiring musicians

for orchestras by exploiting the introduction of screens (or similar devices) that would hide the auditioning musician from the jury. Their findings suggested that gender-blind auditions increase the relative probability that women will advance from the preliminary round or will ultimately be hired in the final round by more than 50 percent, although such auditions also reduce the relative probability of women advancing from a semifinal round in auditions that include a semifinal.

Audit studies do, however, have certain limitations (see Heckman 1998). For one thing, the requirement that two (real) individuals are identical in all dimensions relevant for an employer with the exception of gender is arguably far-fetched. Moreover, because these individuals are not blind to the research process, the design is also subject to demand effects. To address these issues, researchers have turned to *correspondence studies*. Instead of relying on real applicants, correspondence studies leverage fictitious applicants. For example, in response to job advertisements researchers send pairs of resumes, while having full control of the applicants' characteristics as well as the information given to employers. This control is able to generate strict comparability in everything but the group variable of interest, gender. In addition, because of the relatively low marginal cost, researchers can send out a large number of applications to a wide range of employers.

By studying different industries as well as different sets of skills, these studies have questioned the validity of certain theories, such as taste-based models, while also discovering heterogeneous effects that could be interpreted using both statistical discrimination and stereotyping arguments. For example, Riach and Rich (2006) have studied gender discrimination in the English labor market for entry-level jobs. They focused on the so-called type of occupation: male occupations (such as engineer), female occupations (such as secretary), and mixed occupations (such as trainee accountants and computer analysts).

Their results reveal that female candidates are more likely to receive a callback for occupations that are more female-dominated, which could be attributed to employers holding gender stereotype beliefs. Booth and Leigh (2010) had similar results. After studying a sample of over 3,000 applicants in Australia and focusing on female-dominated professions (wait staff, data entry, customer service, and sales jobs), they estimated a callback of 1.28 in favor of women. A similar yet weaker result was found in the Swedish labor market. Also using a large sample (3,228), Carlsson (2011) found a female-to-male callback ratio of 1.07, with a higher rate in female-

dominated occupations and no statistical difference in male-dominated occupations. More recently, Darolia et al. (2016) found no strong evidence of gender-based discrimination when studying almost 9,000 applications across different occupation categories in the United States.

Overall, correspondence studies examining gender-based discrimination show mixed findings. Further research is therefore needed for two reasons. First, the number of studies is small. And, second, the literature suffers from a developed country bias in the sense that research conducted in the developing world is extremely scarce—a problematic situation because women in developing countries exhibit overall worse labor market conditions.

Students' perceptions of employer-based discrimination in Tunisia: Qualitative evidence

This study was motivated by qualitative focus group discussions conducted with 57 female and male students in their last year of tertiary studies at the four main universities in Tunis.⁸ A questionnaire was administered as well.

The findings validate the presence of perceived discrimination in Tunisia's labor market. When asked how important various attributes were when considering a job, an overwhelming 75 percent of students noted that the issue of gender discrimination (or arguably lack thereof) was important when they were considering various occupations. This finding may in turn spill over into the choice of major, and almost 60 percent noted that the matter of gender discrimination crossed their mind when selecting into their current major. In particular, when asked whether “there is a lot of gender discrimination” in their preferred top three occupations, some 30 percent agreed or strongly agreed. However, this may be a conservative downward estimate because perceptions about gender discrimination are endogenous, and, as such, they may have already influenced students' preferences about their top occupations.

As for the hiring process itself, when compared with men, women reported a lower probability of being invited for an interview after sending in a job application (a difference of 25 percent). In focus group discussions, students also noted that discrimination may appear in the initial salary offered and the progression of increases in salary. In citing other forms of discrimination specific

⁸ The 57 students were selected from four universities roughly corresponding to the majors targeted by the correspondence study: Ecole nationale des ingénieurs de Tunis (ENIT), Ecole supérieure des sciences économiques et commerciales de Tunis (ESSEC), Institut des sciences sociales et humaines de Tunis (ISSHT), and Ecole nationale supérieure de l'informatique de Tunis (ENSIT). Students were not sampled at random, but were selected using 'convenience sampling'.

to the hiring process, some students suggested that the barriers generally erected by employers stemmed from their concerns about marriage, child-bearing, family responsibilities, and maternity leave. As a result, employers may choose male applicants who are willing to work overtime and at night, unlike women who cannot go out alone at night. One female undergraduate engineering student illustrated this point by saying, “In fact, one favors a man over a woman for the following reasons. People say that a woman has a family and has children, she should make sacrifices to the detriment of her career, and so she cannot take responsibility. The employer takes this point into account.”

Although almost all participants agreed that discrimination exists, they also noted that the degree depends on the nature of work. Moreover, in some cases the employer is influenced by culture, traditions, and social norms. Participants noted that some occupations are best filled by women instead of men, especially those that require communication or contact with customers, such as an assistant, a secretary, or a receptionist. However, women are less preferred for occupations that require physical effort such as a police officer, taxi driver, soldier, and football team coach. Similarly, participants claimed that in these occupations workers would not accept a female boss. Thus for decision-making positions such as manager, the priority is always given to men, who are perceived to be authority figures, unlike women, who are perceived to be weak and emotional. This point was expressed by a male engineering student: “Maybe some occupations require physical endurance. This automatically plays in favor of the man and creates discrimination.”⁹

5. Experimental design

To examine empirically gender-based discrimination by employers in the Tunisian labor market and to quantify its magnitude, we conducted a field experiment based on the correspondence method used by Bertrand and Mullainathan (2004) in their groundbreaking study. The experimental design consisted of sending fictitious and substantially identical male and female resumes in response to job advertisements. Any differences in callback rates could then be attributed to gender, and thus could be interpreted as gender discrimination. To the best of our knowledge, this is the first study of its kind conducted in the MENA region.

⁹ In industries that may require a higher degree of physical endurance, male employment is indeed higher than female employment. For example, in construction and mining, the share of male employees is over 95 percent (Tunisia Labor Market Panel Survey, 2014).

Selecting economic fields of focus

The sample of economic fields was based on feasibility. The field experiment relied on identification of an outlet in which a large sample of job postings for a given economic field were advertised publicly and transparently. Aside from personal networks, online job platforms appeared to be by far the most popular channel for both employers and applicants to post and seek jobs. Thus the sample was restricted to economic fields that are advertised through Tanit Jobs and Option Carrière, the two largest online job platforms in Tunisia.

Within this sample, the field experiment focused on four economic fields or majors—engineering, finance/economics, IT, and marketing and within those four fields on 14 occupations.

This selection was driven by several reasons. First, these fields are relevant to both students and employers. For students, these four majors represent roughly half of all enrollment in higher education.¹⁰ For employers, these majors represent around 95 percent of advertised vacancies in the online job platforms selected for the experiment.

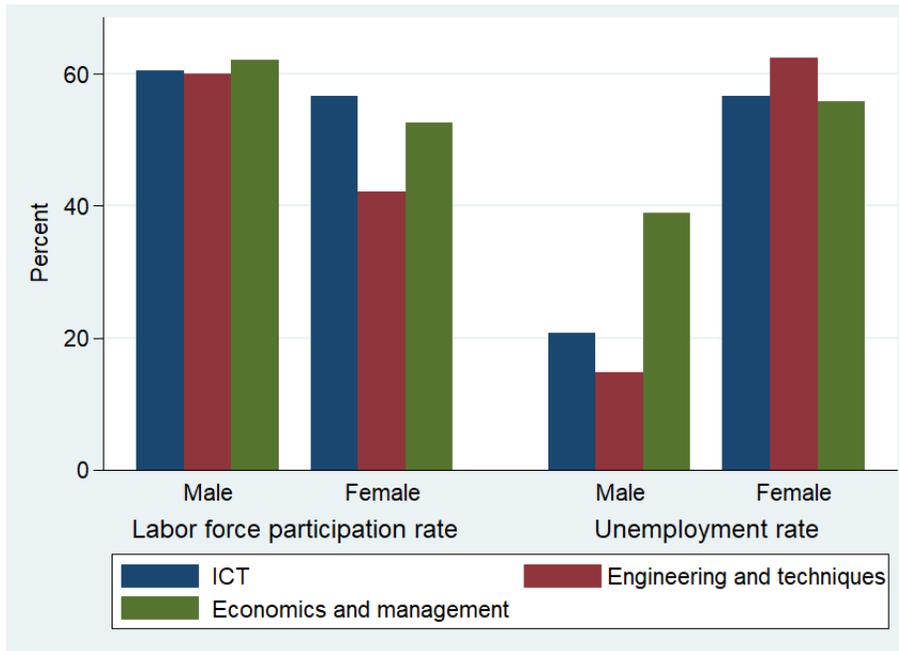
Second, these majors exhibit variation in gender balances as well as gender stereotypes. The IT major has roughly the same number of female (16,994) and male (16,359) students; the engineering major is male-dominated (25,485 male students versus 16,462 female students); and the economics and marketing majors are female-dominated (29,947 female students versus 15,965 male students).

Finally, these majors also exhibit important differences in labor market outcomes by gender, which in turn provides a compelling rationale for testing discrimination by employers at the point of entry (figure 4). For men across the four majors, around 60 percent of graduates join the labor force. Male and female graduates who study IT join the labor market in comparable numbers at 57 percent. However, for the other majors the labor force participation rate is lower for women than for men, especially in engineering. Nevertheless, the stark discrepancy between male and female graduates is in finding a job once they enter the labor market to look for one. In engineering, 15 percent of male graduates are unemployed, compared with 63 percent of female graduates. Similarly, for IT 21 percent of men are unemployed, compared with 57 percent of females.

¹⁰ In the 2016–17 academic year, these four fields captured 45 percent of enrollment in higher education in the country. By gender, these majors capture 36 percent of enrolled female students and 41 percent of enrolled male students.

Together, these numbers highlight that the four majors chosen for the field experiment display a spectrum of discrepancy in the chances of male and female graduates finding employment.

Figure 4 Labor market outcomes by gender and major: Tunisia, 2014



Source: Tunisian Labor Market Panel Survey (TLMPS), 2014, <http://www.erfdataportal.com/index.php/catalog/105>.

Note: In the survey, the marketing major is classified under the economics and management major. ICT = information and communications technology

Creating a bank of resumes

After selecting the four fields of focus, the next challenge was to produce a set of realistic and representative artificial resumes. For that, the study team used the resumes of actual job seekers—collected during the qualitative data collection—as the basis for the artificial ones.

For each of the four majors or fields, a database of productive and nonproductive characteristics was constructed. Productive characteristics influence employers’ hiring decisions. They are languages; certifications; awards; computer skills; high school name, degree, graduation date; bachelor’s university name, degree, graduation date; master’s degree, institution, graduation date; completed internships; completed projects; and community life. Because of the highly specialized nature of the majors and occupation, the input for some of those productive characteristics was developed at the level of an occupation and not within a major. For example, internships filled

differ for electrical and mechanical engineers. To ensure the full credibility of the resumes, the input for the resume characteristics for each major and occupation was obtained through multiple interviews and discussions with students and university professors in Tunis.

Nonproductive characteristics are club membership and hobbies. In terms of applicants' personal characteristics, the sample was restricted to recent and young graduates with no to a limited employment history because of the difficulty faced in constructing a credible employment history. As a result, age variation across resumes could not be applied to test where gender discrimination may differ among younger versus older applicants. In addition, real-life Tunisian resumes do not specify marital status or number of children, and thus this information was not inserted in the resumes. Finally, the experiment was directed at job seekers residing in Greater Tunis (Tunis, Ariana, Ben Arous, and Mannouba).

[Creating identities and contact information for fictitious resumes](#)

Fifteen unique female identities and 15 unique male identities were created for the job applications. Each one was assigned a name, photo, phone number, email address, and home address. The 15 names for each gender were chosen based on the most common Tunisian first and last names. Thirty phone numbers (15 per gender) were also acquired and two operators (one male and one female) were hired and trained to answer calls to those numbers and record the conversations. Because Tunisians do not commonly use voicemail, the 30 phones were activated at all times, with the operators constantly on standby to answer them. The male operator answered the 15 phones associated with male identities, and the female operator answered the 15 phones associated with female identities. Gmail addresses associated with each of the 30 names were set up as well.

Photos were added as is customary in Tunisian resumes. As for the images themselves, a Tunisian photographer hired for the experiment first took several photos of real Tunisian students who matched the profile of the applicants (that is, university graduates within the desired age range), and then digitally altered them to create 15 fictitious female photos and 15 fictitious male photos.¹¹ The original photos ensured that all subjects looked professional and as standardized as possible to avoid introducing any confounders related to attire or facial features. In terms of skin color

¹¹ Even though their actual photos were not used, students were asked to sign a consent form and were given a small financial compensation.

(darker-skinned versus lighter-skinned) and veil (for female candidates), the photos mirrored to the extent possible the actual distribution of both in Tunisia.¹²

Finally, fictitious home addresses were constructed following the usual practice: street number, street name, locality, delegation, governorate, and postal code. It was important to ensure that the distribution of governorates in the database of applicants corresponded to the actual distribution of job seekers in Greater Tunis. Therefore, the majority of applicants were assigned Tunis, followed by Ben Arous, Ariana, and Mannouba. The list of delegations, localities, and street names were then selected, relying on Google Maps to construct plausible home addresses. Finally, street numbers were constructed and added.

Randomization routine

The 1,571 pairs of female and male resumes (3,142 in total) were created by randomly assigning to each the comprehensive set of characteristics devised by the study team and ensuring that, on average, resumes were balanced across genders. The randomization routine was as follows:

- For the applicants' identities, names (along with the phone number and email address corresponding to each name) and photos were randomly assigned to resumes by gender. Home addresses were also randomly assigned across both male and female resumes (that is, they were cross-randomized).
- Nonproductive characteristics, such as hobbies and club memberships, were randomly assigned across both male and female resumes.
- Productive characteristics, such as certifications and awards, were randomly assigned at the major level across male and female resumes. Other productive characteristics, such as projects, internships, and community life, were randomly assigned at the occupation level across male and female resumes. All inputs were qualitatively similar to one another for the pair of male and female resumes but not identical. This was necessary to avoid the risk of detection.
- The same education degree and institution at the secondary and tertiary level were applied to the pair of male and female resumes at the occupation level. The name of the institution was

¹² The team relied on local knowledge and consultations to come up with approximate estimates for the distribution of women who wear the veil and the distribution of darker- versus lighter-skinned people in Tunisia.

also identical to ensure that results were not confounded by the signal that a particular institution name might send to the employer.

- The same computer and language skills were also applied to the pair of male and female resumes at the occupation level, always fulfilling the requirements of the job. Cosmetic changes in the order of the skills listed for the pair were made in order to avoid raising the suspicion of the employer.
- The final resumes were formatted in randomly chosen fonts, layouts, and cover letter styles.
- As a final check during the application stage, minor changes were sometimes made to the resumes to ensure they fully satisfied all the requirements listed in the job advertisement. In these cases, the changes were always made to the pair of male and female resumes in an identical manner.

Table A.2 in the appendix presents the characteristics of applicants by appearance (skin color and use of veil) and by city of residence. The differences in the averages between female and male applicants are balanced and statistically not significant, reflecting the successful randomization of regional information across applicants for both genders.

Implementation: Responding to ads

A pair of resumes (one male and one female) was submitted for each job advertisement in the two online job platforms that met the following criteria:

- The job falls within one of the four economic fields of focus.
- The job is located in Greater Tunis (because most jobs are concentrated in coastal areas, and interior regions have a low demand for labor).
- The job is an entry-level one that requires less than two years of work experience.
- The job advertisement states the employer's name so that any callback can be easily traced. As such, ads with anonymous employer names were excluded.

The four fields were targeted in roughly equal numbers (table 1) in order to establish enough statistical power to test the heterogeneity of estimates by different majors. This is theoretically relevant because some occupations (such as marketing specialists) may require interactions with customers, whereas others (such as mechanical engineers) are more traditionally male-dominated and may require some degree of physical effort.

The 3,142 applications were submitted between May and September 2019 through Tanit Jobs and Option Carrière. When applications were submitted, the name and contact information for each employer were logged, along with information on the position advertised and the specific requirements (such as education, experience, computer skills, or other soft skills). Any employer characteristics listed were also recorded. Additional data on employer characteristics were collected through phone interviews and other search methods. Overall, whenever possible firm type (local/international), firm size, percentage of women working in the firm, whether the firm had any mandated gender quotas, and whether the firm offered any childcare services to its female employees were retrieved.¹³ Table 1 lists some characteristics of the jobs that received the fictitious applications.

Table 1 Characteristics of jobs receiving applications

	Number of application-pairs submitted for advertised jobs	Percent of total
<i>Major</i>		
Engineering	393	25
Finance/economics	339	22
Information technology (IT)		
Marketing	437	28
<i>Occupation</i>		
Engineering: civil engineer	68	4
Engineering: computer engineer	186	12
Engineering: electrical engineer	60	4
Engineering: industrial engineer	45	3
Engineering: mechanical engineer	34	2
Finance/economics: accountant	163	10
Finance/economics: economist	16	1
Finance/economics: financial officer	160	10
IT: IT specialist	189	12
IT: web designer	96	6
IT: web developer	117	7
Marketing: marketing assistant	129	8
Marketing: marketing specialist	173	11
Marketing: web marketing specialist	135	9
<i>Firm origin</i>		
International	314	20

¹³ Among the sample of companies that replied to one or both candidates, other characteristics were collected through follow-up phone calls to better understand their profiles. Of those, 68.51 percent of companies had fewer than 50 workers, and 16.16 percent had between 50 and 100 workers. In general, in 78.73 percent of companies women made up less than 50 percent of all workers, and in 65.58 percent of companies with more than 50 workers, women made up less than a quarter of the workforce. Finally, it is remarkable that 97.88 percent of these companies do not offer childcare services, and 96.99 percent do not have female quotas. Unfortunately, collecting the same set of information from companies that did not reply to either candidate proved to be challenging. Thus the study team was unable to conclusively examine whether gender callback estimates potentially vary across firms with those characteristics.

Local	475	30
Subsidiary	189	12
Not available	593	38
<hr/>		
<i>Job ad location</i>		
Ariana	410	13
Ben Arous	300	10
Mannouba	80	3
Tunis	2,352	75

Measuring responses and outcomes

For each phone or email response by the employer, the content of the phone call or the email was matched with the corresponding application. Whether a given resume elicited a callback from the employer was first coded. Then, the content of the phone call by the employer was grouped into the following categories: application rejected, employer willing to hire immediately, request for an interview over the phone on the spot, request for an interview in person at a later day, request for additional information, and other.

The main outcome indicator, *Employer Callback*, was constructed as follows: (1) a value of 1 if the employer called with the possibility of hiring (whether to ask for an interview or additional information) or (2) a value of 0 if the employer did not call back or called to reject the candidate. Two secondary outcome indicators were also measured: (1) a categorical variable on the type of employer answer and (2) the average time required for an employer to respond from the time of application.

6. Empirical strategy and main results

Average differences in callback rates: (Positive) gender discrimination

Overall, 67 percent of employers advertising jobs did not respond to either applicant within the pair, whereas 15 percent responded to both applicants. Of the employers who responded to one applicant but not the other, 11 percent responded only to the female applicant and 8 percent responded only to the male applicant. At face value, then, it seems that female applicants (25 percent) were, on average, more likely than male applicants (23 percent) to receive a callback.

To more systematically analyze the extent to which differences in the callback rates are due to gender, the study team relied on the econometric specification

$$Employer\ Callback_i = \alpha + \beta Female_i + \varepsilon_i, \quad (1)$$

where the outcome of interest for a given applicant i is the binary indicator for receiving a callback from the employer with the possibility of hiring, and the key variable of interest is $Female_i$, an indicator of whether applicant i is female. Here, the main estimate of interest is β , which represents the average treatment effect of being female on the employer callback rate—that is, the difference in the callback rates for men and women solely due to their gender.

Additional models included either *Major* specific fixed effects ($\sum_{j=1}^n \gamma_j Major_{ij}$), or *Occupation* specific fixed effects ($\sum_{j=1}^n \gamma_j Occupation_{ij}$). In more saturated models (not shown), controls for firm-level characteristics were also included. In all cases, the results remained the same. To follow best practices, equation (1) was estimated using a linear probability model (Angrist and Pischke 2008), but the results were substantially identical if parametric estimations had been used. Similarly, as is standard, standard errors at the unique job ad level were clustered, thereby allowing errors to be arbitrarily correlated within each job advertisement.

Table 2 shows the results. On average, female applicants had a higher callback rate than male applicants. The difference—around 2.5 percentage points—is not substantially trivial because it represents more than a 10 percent increase over the average male callback rate. Indeed, this result is robust and is precisely and identically estimated across different econometric specifications.

Table 2 Overall estimates by major and occupation

	Employer callback		
	(1)	(2)	(3)
Female applicant (β)	0.025** (0.011)	0.025** (0.011)	0.025** (0.011)
Observations	3,142	3,142	3,142
Clusters	1,571	1,571	1,571
R-squared	0.00	0.04	0.75
Outcome control mean	0.23	0.23	0.23
Major fixed effects	No	Yes	Yes
Occupation fixed effects	No	No	Yes

Note: Clustered standard errors by job advertisement appear in parentheses.

* $p < 0.10$ ** $p < 0.05$ *** $p < 0.01$.

At face value, this average result represents an encouraging finding when thinking about the potential role of discrimination against women in the labor market because it reveals instead slight

positive discrimination in favor of women. However, to further understand this finding we examine the conditional effects of gender by field and occupation in the next section.

Gender discrimination across economic fields

Although the results of this study suggests positive discrimination in favor of women, there are many reasons to believe that such an effect masks important and substantial heterogeneity. The evidence discussed in previous sections has suggested that industries exhibit different gender biases, mainly through different stereotypes regarding the employment of women. For that reason, the first way to further examine the presence of gender discrimination in the labor market is through the lens of the four majors represented in the study sample—engineering, finance/economics, IT, and marketing—and then, in more detail, through the lens of occupations within them.

The raw data support the notion that the gender effect is likely conditional on the field of employment. Table 3 describes the different types of callback rates (equal treatment, male-favored, and female-favored) across the four majors. At face value, the differences between IT and marketing are striking. In IT, women seem to incur discrimination; in marketing, they seem to enjoy positive discrimination. Women also seem to be slightly favored in the finance/economics field, whereas no clear difference appears in engineering.

Table 3 Distribution of callbacks from employers by major

	Engineering	Finance/economics	IT	Marketing
Equal treatment:				
% of job ads in which both resumes in one pair did not receive an employer callback	76 (299 obs.)	82 (277 obs.)	60 (242 obs.)	52 (229 obs.)
% of job ads in which both resumes in one pair did receive an employer callback	14 (54 obs.)	6 (21 obs.)	15 (62 obs.)	22 (96 obs.)
Male-favored:				
% of job ads in which the male resume in one pair received a callback	5 (18 obs.)	4 (14 obs.)	20 (79 obs.)	3 (15 obs.)

Female-favored:				
% of job ads in which the female resume in one pair received a callback	6 (22 obs.)	8 (27 obs.)	5 (19 obs.)	22 (97 obs.)

Note: The number of observations associated with each percentage appears in parentheses.

A more rigorous and systematic examination of the heterogeneous effect of gender by economic field (occupation) relies on the econometric specification

$$Employer\ Callback_{ij} = \sum_{j=1}^n \delta_{ij} Female_i \times Major_{ij} + \sum_{j=1}^n \gamma_j Major_{ij} + \varepsilon_i, \quad (2)$$

where the estimate of interest is δ_{ij} , which measures the difference in callback rates by gender for applicants in major j . For example, when j identifies the IT major, then δ_{ij} represents the difference in the callback rates between men and women who applied for jobs in the IT sector. To ease the exposition of results, this specification uses an exclusive and exhaustive partition of economic fields (occupations), thereby removing the constant.

Table 4 summarizes the results. The results for majors confirm that women have a higher predicted probability of receiving a callback in marketing by about 19 percentage points (74 percent), as well as in finance by about 4 percentage points (37 percent), whereas men have a higher predicted probability of receiving a callback in IT by about 15 percentage points (43 percent). Furthermore, no evidence of discrimination is found in engineering. Table 4 disaggregates the results at the occupation level, replicating the previous findings.

Table 4 Heterogeneity of estimates by economic field and occupation

Differences in callback rates between female and male applicants by	Coefficient	Standard error	P-value	[95% confidence interval]	
<i>Major</i>					
Engineering	0.010	0.016	0.53	-0.021	0.042
Finance/economics	0.038**	0.019	0.04	0.001	0.075
IT	-0.149***	0.024	0.00	-0.195	-0.103
Marketing	0.188***	0.023	0.00	0.143	0.232
<i>Occupation</i>					
Civil engineer	-0.044	0.039	0.26	-0.120	0.032
Computer engineer	0.032	0.026	0.22	-0.019	0.084
Electrical engineer	-0.033	0.033	0.32	-0.098	0.032
Industrial engineer	0.000	0.032	1.00	-0.062	0.062
Mechanical engineer	0.088*	0.049	0.07	-0.008	0.184

Accountant	0.018	0.028	0.51	-0.037	0.074
Economist	0.063	0.061	0.30	-0.057	0.182
Financial officer	0.056**	0.027	0.04	0.003	0.109
IT specialist	-0.048	0.034	0.16	-0.114	0.019
Web designer	-0.219***	0.050	0.00	-0.316	-0.122
Web developer	-0.256***	0.041	0.00	-0.336	-0.177
Marketing assistant	0.217***	0.044	0.00	0.131	0.303
Marketing specialist	0.266***	0.038	0.00	0.191	0.341
Web marketing specialist	0.059*	0.031	0.06	-0.002	0.120

Note: The table reports the estimations of equation (2). The panel on majors regresses the callback dummy on interaction terms between the female dummy and each of the four major dummies. The panel on occupations regresses the callback dummy on interaction terms between the female dummy and each of the 14 occupation dummies. Only the interaction terms between the female dummy and each major/occupation dummy are reported (δ_{ij}).

* $p < 0.10$ ** $p < 0.05$ *** $p < 0.01$.

Additional outcomes: Callback types and times

Beyond the differences in the callback rates, this study examines (1) the type of call and (2) the time that lapsed before the employer called the applicant.

Distribution of employers' callbacks by gender

Employers' callbacks were documented, specifying whether the call was to request an interview over the phone on the spot, request an interview at a later date, request additional information, or for other purposes. To determine whether the distribution of callback types was affected by gender, a goodness of fit test was carried out by using both the Pearson chi-squared test and Fischer's exact test.

Table 5 presents the distribution of employers' callback responses by gender. Women are more likely to be invited for an in-person interview for a later date by 9 percentage points, whereas men are more likely to be interviewed on the spot over the phone by 10 percentage points. This finding may signal that employers would prefer to screen female candidates in person and may also indicate that more scrutiny or discrimination is exercised at the interview stage.

Table 5 Distribution of employers' responses in callbacks by gender

Employer response	Number of male observations	Number of female observations	Total
Invite to an interview	269 (77%)	339 (86%)	608 (82%)
Require further information	13 (4%)	10 (3%)	23 (3%)
Interview on the spot	58 (17%)	26 (7%)	84 (11%)
Other	9	17	26

	(3%)	(4%)	(4%)
Pearson chi-squared test	0.00		
Fisher's exact test	0.00		

Note: The last two rows report the p-value for a test of proportion testing the null hypothesis that the distribution of employers' responses is equal across both genders.

Differences between female and male applicants in response time

In attempting to determine whether the length of time taken by employers to contact applicants was affected by gender, the study team performed mean comparison tests for each major and occupation. The tests were evaluated under t-tests that presume large samples and Wilcoxon tests that provide a nonparametric perspective, thereby increasing the confidence in the robustness of the results.

Table 6 reveals that there are no gender differences in the time taken by employers to respond to applications. Across all resumes, employers took an average of 21 days to respond to women from the time of the application submission and an average of 23 days to respond to men. However, this difference is not statistically significant. No differences were found by major or occupation, with the exception of computer engineering, where employers took an average of 14 days to respond to females and an average of 24 days to respond to males.

Table 6 Gender differences in the average number of days employers take to respond

	Time to respond (days)			P-values	
	Male	Female	Ratio	Wilcoxon test	T-test
<i>Major</i>					
Engineering	23.56	19.16	1.23	0.14	0.26
Finance/economics	7.50	16.15	0.46	0.23	0.06
IT	25.81	19.56	1.32	0.28	0.17
Marketing	25.50	26.06	0.98	0.39	0.91
<i>Occupation</i>					
Civil engineer	17.83	21.56	0.83	0.67	0.69
Computer engineer	23.68	14.25	1.66	0.03	0.03
Electrical engineer	26.24	24.07	1.09	0.73	0.83
Industrial engineer	29.50	49.50	0.60	1.00	0.74
Mechanical engineer	30.00	36.25	0.83	1.00	–
Accountant	8.35	19.08	0.44	0.25	0.10
Economist	2.00	3.50	0.57	1.00	–
Financial officer	5.17	11.92	0.43	0.51	0.18

IT specialist	29.96	22.43	1.34	0.70	0.32
Web designer	25.92	20.71	1.25	0.37	0.59
Web developer	20.77	10.47	1.98	0.43	0.07
Marketing assistant	33.23	28.21	1.18	0.88	0.59
Marketing specialist	22.47	32.95	0.68	0.20	0.20
Web marketing specialist	20.34	15.83	1.28	0.83	0.50
Total	23.48	21.48	1.09	0.71	0.40

Note: The table shows by major and occupation the number of days taken by employers to contact both male and female applicants after the application submission date, as well as the ratio. The last column also reports the p-value for a test of proportion testing the null hypothesis that the callback rates are equal across both genders. Due to the reduced number of observations, it was not possible to calculate the t-test for mechanical engineers and economists.

7. Additional determinants of gender discrimination in the labor market

The findings so far shed light on the extent and magnitude of gender discrimination in the Tunisian labor market. Meanwhile, the experimental research design allows further analysis of the extent to which additional factors shape the presence of discrimination against or in favor of women. To do so, the analysis focused on three factors: (1) the characteristics of the applicant, (2) the characteristics of the employer, and (3) the characteristics of the job posting itself.

Characteristics of the applicant

Certain characteristics of applicants can affect his or her eligibility, and these traits can have gender differential effects. This experimental study was designed to investigate the potential moderating role of key individual characteristics related to race, ethnicity, and religion: (1) skin color (that is, whether darker or lighter), (2) whether women are shown wearing a veil, and (3) the region of residence—Ariana, Ben Arous, Mannouba, or Tunis—of the applicant.

The applicants' characteristics were consistent across both men and women as well as for the different job advertisements (that is, within each major all applications had the same level of education, skills, years of experience, age, and so forth). Only the applicant's region of residence, appearance (veiled or unveiled for women), and skin color were cross-randomized, which allowed interpretation of the effects in a causal way.

To rigorously estimate these conditional effects, the econometric estimation for veiled or nonveiled and region of residence follows the same approach as in equations (1) and (2), respectively. For skin color, the following specification was used:

$$Employer\ Callback_{ij} = \eta + \alpha Female_i + \sum_{j=1}^{n-1} \beta_{ij} Female_i \times lighterskinned_{ij} + \sum_{j=1}^{n-1} \gamma_j lighter\ skinned_{ij} + \varepsilon_i \quad (3)$$

For this specification,

- α captures gender differences in callback rates for darker-skinned applicants
- $\alpha + \beta_j$ is the gender differences in callback rates when the applicant is lighter-skinned
- β_j is the marginal increase in the difference of the gender callback rates for lighter-skinned applicants versus darker-skinned ones.

Table 7 presents the results. It indicates that there are no differences in callback rates between females and males by the applicant's skin color or region of residence. However, women who are veiled are less likely than nonveiled women to receive a callback. This causal effect is substantially large, at about 8.5 percentage points (30 percent).

Table 7 Effects of applicant characteristics on gender differences in callback rates

	Coefficient	Standard error	P-value	[95% confidence interval]	
<i>Skin color</i>					
Difference in gender callback rates when applicants are lighter-skinned	0.022	0.030	0.46	-0.037	0.082
<i>Veiled or nonveiled</i>					
Difference in callback rate between veiled and nonveiled women	-0.085***	0.022	0.000	-0.128	-0.041
<i>Region of residence</i>					
Difference in callback rates for male and female applicants from Ariana	0.022	0.031	0.47	-0.038	0.083
Difference in callback rates for male and female applicants from Ben Arous	0.015	0.029	0.60	-0.042	0.073
Difference in callback rates for male and female applicants from Mennouba	0.055	0.040	0.17	-0.023	0.133
Difference in callback rates for male and female applicants from Tunis	0.021	0.022	0.35	-0.022	0.064

Note: The panel on skin color reports the results from equation (3), where the callback dummy was regressed on the full interaction between the female dummy and the lighter-skinned applicant dummy. Only the coefficient on the interaction term between the female dummy and the lighter-skinned applicant dummy is reported in the table (β_{ij}). In the panel on veiled or nonveiled, the callback dummy was regressed on a veiled female dummy and the four major dummies and solely for the subset of female applicants, following the approach in equation (1). Only the coefficient on the veiled female dummy is reported in the table (β_i). In the panel on region of residence, the callback dummy was regressed on the interaction terms between the female dummy and each of the four region dummies, following the approach in equation (2). Only the coefficient on the interaction term between the female dummy and the region dummy is reported in the table (δ_{ij}).

* $p < 0.10$ ** $p < 0.05$ *** $p < 0.01$.

Characteristics of the employer

Some characteristics of employers can also have an impact on the gender of the applicants selected for callbacks. The data available allowed study of the potential discrimination sources that emerged from the type of firm (international, local, or subsidiary), and the location of the firm (Ariana, Ben Arous, Mannouba, or Tunis).

Table 8 replicates the approach used in equation (2) to examine the extent to which differences in callback rates between men and women vary by the type of firm and the location of jobs. Overall, no differences emerge in gender callback rates, with the exception of job ads located in Tunis, where women seem more likely than men to receive a callback. However, this finding may not be surprising because Tunis is home to about three-fourths of the sample, reflecting an average effect similar to that in the baseline results.

Table 8 Effects of employer characteristics on gender differences in callback rates

Difference in callback rates for male and female applicants for jobs in	Coefficient	Standard error	P-value	[95% confidence interval]	
Ariana	-0.020	0.031	0.53	-0.080	0.041
Ben Arous	0.040	0.028	0.16	-0.015	0.095
Mannouba	-0.050	0.061	0.41	-0.169	0.069
Tunis	0.033**	0.013	0.01	0.008	0.058
International firms	0.006	0.026	0.81	-0.044	0.057
Local firms	0.015	0.019	0.45	-0.023	0.053
Subsidiary firms	0.032	0.027	0.24	-0.021	0.085

Note: The table reports the results from equation (2). The callback dummy was regressed on the interaction terms between the female dummy and each of the dummies that represent the employer's characteristics. Only the coefficient on the interaction term between the female dummy and the employer's characteristic dummy is reported in the table (δ_{ij}).

* $p < 0.10$ ** $p < 0.05$ *** $p < 0.01$.

Characteristics of the job posting

Job advertisements are not homogeneous; vacancies have specific requirements often associated with stereotypes of the skills associated with men and women. It was therefore critical and meaningful to explore whether features of the job advertisement itself can moderate the effect of gender on the hiring process.

To do so, the study team followed the specification in equation (3) and leveraged three types of variables: (1) language ability (for jobs that require French, English, or other languages); (2)

computer skills (for jobs that require word or data processing skills, such as those needed for Microsoft Office); and (3) soft skills (for jobs that require teamwork or organizational skills).

For descriptive purposes, 52 percent of jobs in the study database required French, 32 percent English, and 2 percent other languages. For computer skills, 63 percent required knowledge of Microsoft Office, and 25 percent required other computer skills. For soft skills, 10 percent required strong teamwork skills, and 8 percent strongly emphasized organizational skills.

Table 9 summarizes the results. Overall, women appear more likely to receive a callback for job postings requiring French language skills when compared with jobs that do not require these skills. Women also are more likely to receive a callback for jobs that require knowledge of Microsoft Office. By contrast, men are more likely than women to receive a callback for jobs that require other computer skills. That said, interpretation of these results should take into account the potential confounders of some of these characteristics. For example, French is overwhelmingly required in marketing positions (about 75 percent) but not in the other fields, where it is required about 40 percent of the time. Similarly, other computer skills are required in IT over 90 percent of the time compared with 19 percent in finance, 27 percent in marketing, and 59 percent in engineering. In summary, these findings are in line with earlier evidence about heterogeneity of gender discrimination by field.

Table 9 Effects of gender on differences in callback rates by job requirement

Marginal increase in gender callback gap due to skill requirement:	Percent of jobs requiring skill	Coefficient	Standard error	P-value	[95% confidence interval]	
French	52	0.064***	0.023	0.01	0.018	0.110
English	32	-0.055**	0.028	0.05	-0.109	-0.001
Other languages	2	0.070	0.062	0.26	-0.053	0.192
Microsoft Office	63	0.089***	0.028	0.01	0.035	0.144
Other computer skills	25	-0.145***	0.021	0.00	-0.187	-0.104
Teamwork	10	-0.017	0.029	0.55	-0.074	0.039
Organizational skills	8	0.029	0.033	0.37	-0.035	0.094

Note: The table reports the results from ordinary least squares regressions in which the callback dummy was regressed on an interaction term between the female dummy and the required group of skill dummies, following the approach in equation (3). Only the coefficient on the interaction term between the female dummy and the skill requirement dummy is reported in the table (β_{ij}).

* $p < 0.10$ ** $p < 0.05$ *** $p < 0.01$.

8. Discrimination beyond the screening point: Evidence from survey data

These experimental results are informative about gender discrimination in the job application process. However, discrimination in the labor market is not restricted to the hiring stage; a large share of discrimination occurs during employment, whereby the labor of men and women is valued differently by the market. To further examine gender differential beyond the point of hiring, this study examined the monthly wage differentials between men and women using the 2014 Tunisian Labor Market Panel Survey (TLMPS).¹⁴

Table 10 presents the average differences in monthly wages between men and women at different disaggregation levels. It suggests a systematic tendency to value the labor of men over that of women and pay men higher wages than women. Indeed, the median wage for men is higher than the median wage for women in both urban and rural areas. Moreover, the raw gender gap in median wages persists at all age levels and for all education levels. In terms of sector of employment, the median wage for women is slightly higher than that of men in government jobs, a result consistent with the findings that the public sector tends to have favorable conditions for women's employment. However, the median wage for men is higher in the private sector and in semipublic enterprises.

Table 10 Raw wage differentials by area, education level, age, and sector of employment

Raw wage differential (monthly in Tunisian dinars)			
	Median, men	Median, women	P-value continuity (median equality)
<i>Overall</i>	444	325	0.00
<i>Area</i>			
Urban	500	359	0.00
Rural	400	300	0.00
<i>Education level</i>			
Illiterate	315	260	0.00
Read and write	400	300	0.01
Under intermediate	418	300	0.00

¹⁴ This section broadly complements the field experiment and substantiates the prevalence of gender wage differentials for workers at all education levels. It is not limited to the target group of the field experiment because the TLMPS is not sufficiently broad to allow a wage decomposition analysis for tertiary-educated workers only. Future research will help reveal the magnitude of the gender wage differential among those workers.

Intermediate	620	425	0.14
Above intermediate	712	658	0.41
University and above	950	855	0.00
<i>Age group</i>			
15–24	347	265	0.00
25–34	421	350	0.02
35–44	478	412	0.31
45–54	450	378	0.00
55–65	460	260	0.14
<i>Sector of employment</i>			
Government	600	653	0.20
Public enterprise	435	375	0.85
Private	400	300	0.00

Raw wage differences provide a gross description of the ways in which the labor market takes into consideration gender to remunerate labor. However, based on the previous analysis it is difficult to determine whether these differences occur because men are better endowed than women for jobs or because, conditional on similar levels of endowments, the market assigns more value to men than to women (discrimination). To distinguish between the two, the Blinder-Oaxaca methodology is adapted to estimate the explained portion of the wage gap due to observed human capital endowments (endowment effect) and the unexplained portion that may be due to discrimination (coefficient effect). The first stage consists of identifying the coefficients of the linear regression suggested by equations (4) and (5):

$$\ln(\text{Wage})^g = \beta_0^g + \beta_1^g \text{age} + \beta_2^g \text{age}^2 + \beta_3^g \text{experience} + \beta_4^g \text{experience}^2 + \beta_5 \text{locality} \\ + \sum_{i \in \text{Governorate}} \eta_i^g \mathbb{I}_i + \sum_{i \in \text{Education Level}} \delta_i^g \mathbb{I}_i + \varepsilon^g \quad (4)$$

$$\ln(\text{Wage})^g = \sum_{j \in \text{Industry}} \left(\beta_{0,j}^g \mathbb{I}_j + \beta_{1,j}^g \text{age} \mathbb{I}_j + \beta_{2,j}^g \text{age}^2 \mathbb{I}_j + \beta_{3,j}^g \text{experience} \mathbb{I}_j + \beta_{4,j}^g \text{experience}^2 \mathbb{I}_j \right. \\ \left. + \beta_5 \text{locality} \mathbb{I}_j + \sum_{i \in \text{Governorate}} \eta_i^g \mathbb{I}_i \mathbb{I}_j + \sum_{i \in \text{Education Level}} \delta_{i,j}^g \mathbb{I}_i \mathbb{I}_j \right) + \varepsilon^g. \quad (5)$$

In the previous equations, $\ln(Wage)$ represents the logarithm of the monthly wage;¹⁵ age is the age in years of the individual; $experience$ is the working experience of the person calculated following Hara (2018); $locality$ is a binary variable that takes the value of 1 if the individual is from an urban area; \mathbb{I} is an indicator function used to represent dummy variables of $education\ level$ and $governorate$ where the individual resides; and g stands for gender because the coefficients are calculated independently for male and female.

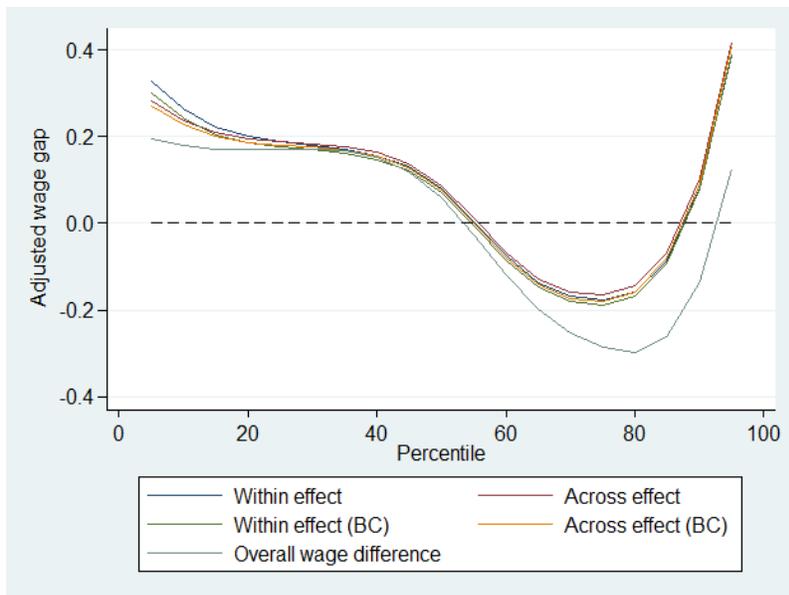
Applying the Blinder-Oaxaca decomposition to equation (4) produces the endowment-coefficients decomposition across industries. By contrast, applying the Blinder-Oaxaca decomposition to equation (5) produces the endowment-coefficients decomposition within industries. This difference may reveal whether discrimination occurs across industries or within industries.

Complementing the previous methodology, recent studies such as Ahmed and McGillivray (2015) suggest that the calibration of equations (4) and (5) may contain an implicit selection bias. The fact that individuals are employed reveals that they have some special unobservable attributes that allow them to be hired. To correct for this bias, a Heckman correction model was implemented in which the first stage estimates the probability of being employed conditional on (1) the covariates used in equation (4), (2) being head of household, and (3) dummies for marital status. The predicted score is used to calculate the inverse Mills ratio, and this variable is added as an additional covariate to equations (4) and (5). This model, called bias-corrected (BC), adjusts the Blinder-Oaxaca decomposition to incorporate those unobservable skills that guarantee the employment of the individuals in the sample. Finally, based on Hara (2018) a recentered influence function (RIF) regression method was used as proposed by Firpo, Fortin, and Lemieux (2018).¹⁶ This technique allowed re-creation of the Blinder-Oaxaca decomposition at different wage levels. Figures 5 and 6 summarize the results graphically.

Figure 5 Coefficient effect of gender wage gap by industry

¹⁵ While the TLMPS includes information on number of hours worked, converting monthly wages to hourly wages adds more noise to the data. Therefore, the results are presented using monthly wage data.

¹⁶ The results of the RIF regressions were calculated for every five percentiles between 2 and 95. To avoid noise from specific outliers, the results presented take those calculations and filter them using a locally weighted regression. By doing so, the trends displayed are more robust to variations in individual values.



Note: BC = selection bias-corrected.

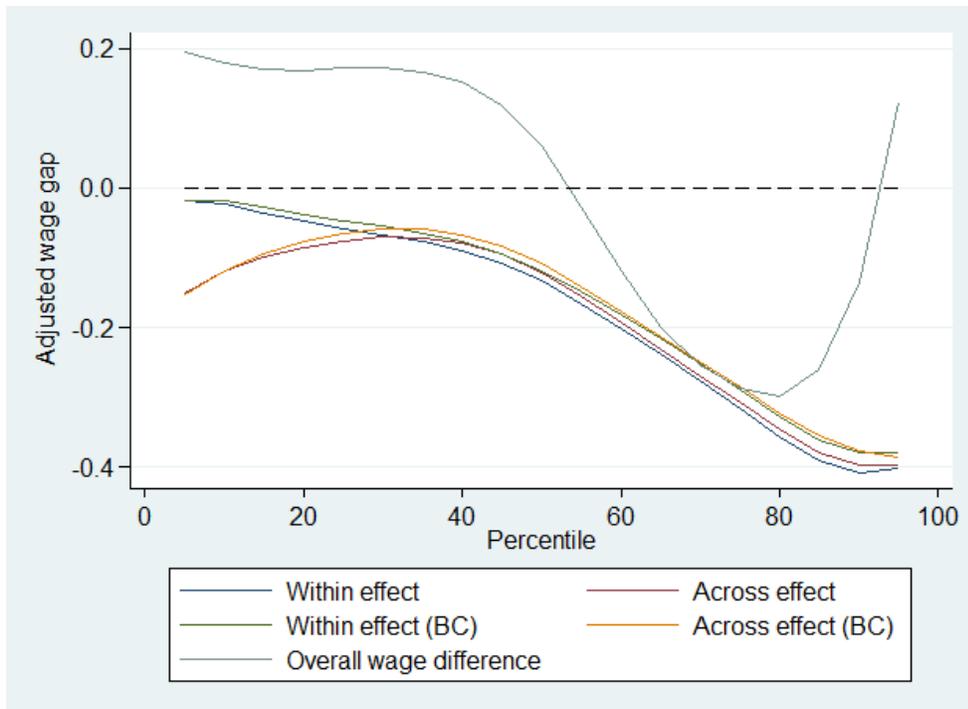
Figure 5 presents the raw wage differential at each percentile of the wage distribution and then captures the coefficient effect of the wage gap for every wage percentile. This means that for each wage percentile the analysis compares (in a standardized framework) the average wage difference of a man and a woman that have the same level of endowments. The figure suggests that for individuals whose wage is below the 60th percentile and above percentile 85, the market provides men with higher remuneration than women. This finding confirms that men receive higher returns than women on their endowments because of discrimination. To be more specific, for the fifth percentile, the coefficient effect ranges from 0.27 to 0.33 standardized wage units; for the first quarter from 0.18 to 0.19; for the median from 0.07 to 0.09; for the third quarter from -0.19 to -0.17; and for the 95 percentile from 0.39 to 0.42. This indicates that the highest level of discrimination is observed in both the highest and the lowest wage percentiles.

However, between the 60th and 85th percentiles the evidence suggests that women are remunerated more than men in equivalent jobs. Nevertheless, this gap is considerably smaller than the gap that favors men in other scenarios. Figure 5 also shows that the four types of regressions are overlaying each other, which suggests that wage discrimination happens in the same way across and within industries.

Figure 6 presents the raw wage differential at each percentile of the wage distribution and then captures the endowment effect of the wage gap for each wage percentile. This means that for each

wage percentile, the analysis compares (in a standardized framework) the wage difference between a man and a woman if her endowments were remunerated by the market at the same price as those of her male counterpart. The range of the graph is negative, and, independent of the analysis, the wage grows negatively larger at higher wage percentiles. In particular, for the fifth percentile the endowment effect ranges from -0.15 to -0.02 standardized wage units; for the first quarter from -0.08 to -0.05 , for the median from -0.13 to -0.11 ; for the third quarter from -0.32 to -0.29 ; and for the 95th percentile from -0.40 to -0.38 .

Figure 6 Endowment effects of gender wage gap by industry



These results indicate that none of the observed gender wage gaps is due to the higher endowments of men and that women need to be systematically better prepared than men for a given wage. The endowment effect is low at low wages because these jobs usually require basic skills. Thus the level of endowments is in general low. Yet once a job position requires a wider sets of skills (proxied by larger wages), a woman must be overprepared to get the same wage for a given position as a man. Meanwhile, in contrast to figure 5, in the endowment effect the cross-industry effect separates itself from the within-industry effect for the largest half of the wages, suggesting that the difference in endowments is mostly concentrated in specific industries.

Although figures 5 and 6 account for industry of employment in calculating wage discrimination, female segregation into certain occupations may also play a role in influencing the gender wage gap, particularly if women self-select into lower-productivity occupations. To account for that, figures 7 and 8 present the coefficient and endowment estimates within and across occupations. The results are consistent with the earlier findings by industry and confirm that the unexplained portion of the wage gap grows by almost four times from the lowest wage quantiles to the highest wage quantiles.

Figure 7 Coefficient effects of gender wage gap by occupation

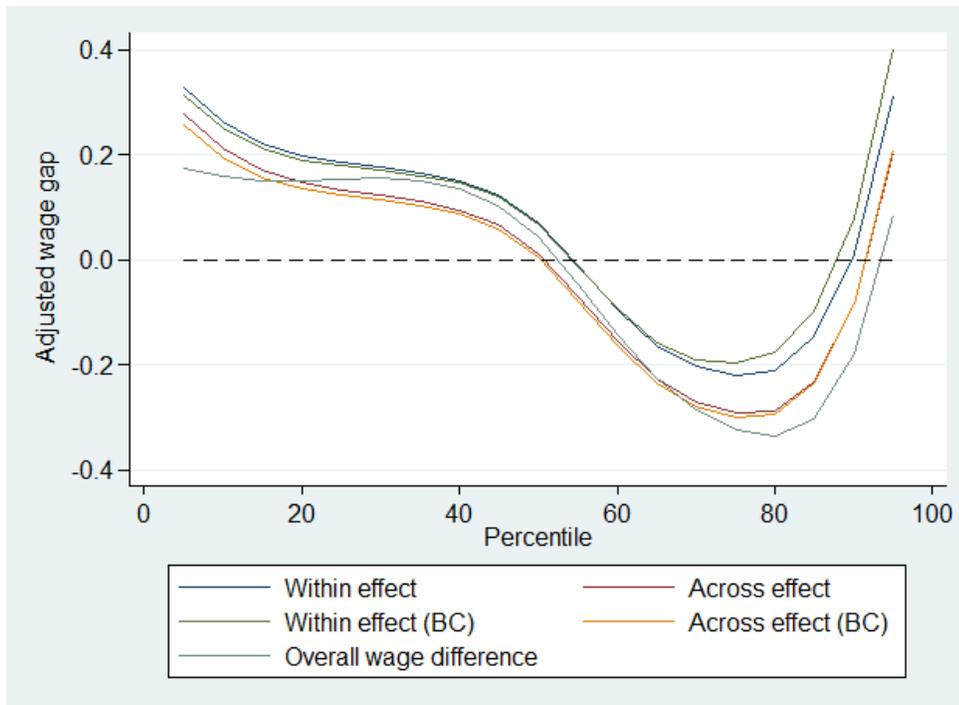
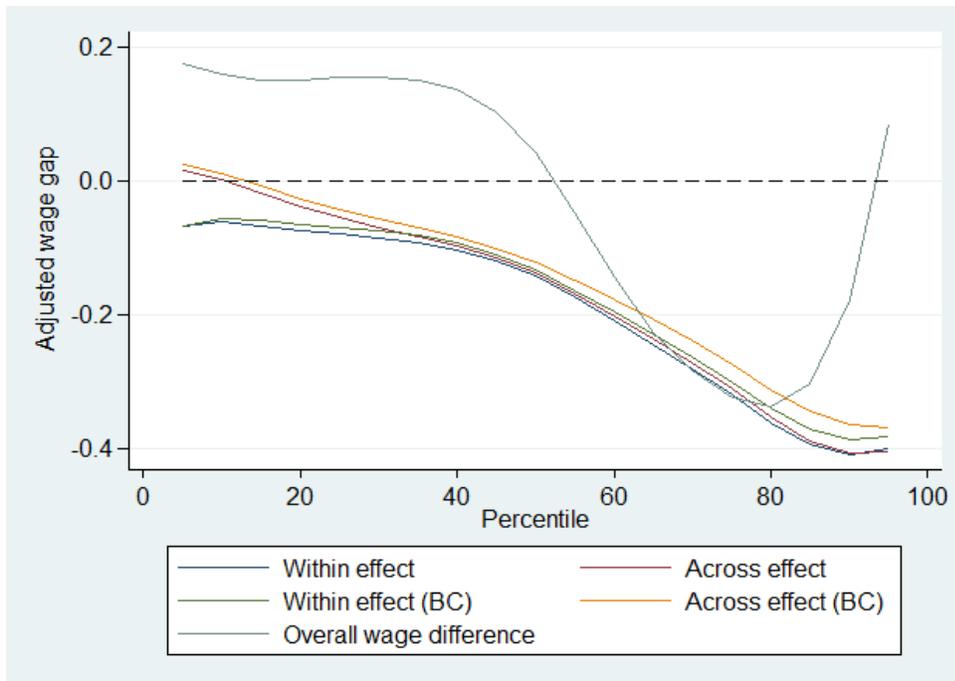


Figure 8 Endowment effects of gender wage gap by occupation



9. Limitations of the study and areas for future research

Despite the methodological advances provided by correspondence studies, a number of caveats remain and should be considered when interpreting the results of this study. First, as for external validity, the results cannot be generalized to all employers and job seekers in Tunisia. On the employer side, the experiment is limited in scope to four specific fields of study, and thus the results are not generalizable to other fields of study. Even within these four fields of study, the results may not be generalizable at the level of each field because the jobs advertised through the two platforms used may not be fully representative of all jobs in each field. Moreover, the experiment is designed to test discrimination at point-of-entry and for entry-level jobs in Greater Tunis, meaning the results are not necessarily generalizable to other skilled positions requiring longer work experience or to vacancies outside Greater Tunis. On the job seeker side, the four chosen majors capture 47 percent of tertiary-educated students in Tunisia.

Other limitations mostly pertain to the information included in resumes in Tunisia. Applicants' number of children and marital status are typically not included in Tunisian resumes, which limits analysis of the typically assumed bias against women who enter the “marriage market” (Assaad, Ghazouani, and Krafft 2017).

Second, the scope of the experiment sheds light on whether discrimination takes place at the top tier of educational attainment, but it cannot formally answer *why* any discrimination revealed takes place. Third, this study answers questions about average callback rate differences assuming constant, nonadaptive job applicant behavior in their search for jobs. In other words, the experiment does not account for modifications in an application strategy after an applicant receives a certain number of rejections or for modifications that account for specific job seeker requirements (Fix and Struyk 1993). Fourth, the fact that the dependent variable is callback rates (and not wage offers) establishes a nonlinear relationship that could throw results into doubt if employers believe there is potential heterogeneity in the unobserved variance of productive characteristics between males and females (Heckman and Siegelman 1993; Neumark 2012). This experiment, like all correspondence studies, attempts to balance productive characteristics between two similar population groups (high achieving and recent male and female graduates), but it cannot control for employers' beliefs or the variance in unobserved qualities. If employers indeed believe there is more variance in males, they are more likely to lean toward hiring males even if there are no *average* differences between observed and unobserved characteristics.

Finally, it is important to note the ethical considerations typically brought up in relation to correspondence studies, the most important of which is the assumption that the benefits gained from the study outweigh the unintended waste of time incurred by employers in screening fictitious applications. To minimize this cost, employer callbacks that entailed the possibility of hiring (whether requests for an interview or for additional information) were politely declined within a week.

10. Conclusions

The average gap in the unemployment rate in Tunisia between tertiary-educated men and women reached 17 percentage points in 2014. To what extent is this gap a result of gender discrimination? This study attempts to answer that question. On the one hand, the study finds that, on average, there is positive discrimination in favor of women because they are more likely to be contacted by an employer. On the other hand, subgroup analyses reveal that discrimination both in favor of and against women exists, and the magnitudes are substantial.

The fact that discrimination against women is more pronounced in certain occupations than in others is in line with the stereotypes that result in female applicants being treated differently than male applicants, *even* when they have the same skills and potential productivity. In the IT sector—where there is gender parity in enrollment at the higher education level—women are 15 percentage points (43 percent) less likely to receive a callback from an employer. This finding may explain in part why the unemployment rate of female graduates is 36 percentage points higher than that of their male peers in the Tunisian IT sector.

On the other hand, no discrimination was found against women in male-dominated engineering occupations, even as the actual unemployment gap in this field reached a staggering 48 percentage points in 2014. Positive discrimination toward women was strongly observed in the marketing field, and somewhat weakly in the finance/economics field. Specifically, the results confirm that in marketing a female applicant had a higher probability—by about 19 percentage points (74 percent)—of receiving a callback. Even with positive discrimination, women who graduate with a marketing degree are still less likely than men to find employment, as indicated by an unemployment gap of 19 percentage points.

Meanwhile, this study finds that women are discriminated against based on physical appearance. Veiled women are 8.5 percentage points less likely to receive a callback than nonveiled women. Potentially, this finding goes beyond physical appearance and relates to the strength of religious beliefs and practices.

Some explanations could reconcile the positive discrimination in favor of women, on average and in some fields, with the widening gaps in unemployment between men and women in the Tunisian labor market. First, this study measures discrimination at the screening stage and does not rule out that women face discrimination at the interview stage and beyond. Conditional on receiving a callback from the employer, women are more likely to be asked, by 9 percentage points, to schedule an interview in person for a later date, whereas men are more likely, by 10 percentage points, to be interviewed on the spot over the phone. One could argue that this finding suggests that more scrutiny or potential discrimination could be exercised at the interview stage.

Beyond hiring, women face wage discrimination in employment. In Tunisia, the median wage for men is higher than the median wage for women at all age levels and for all education levels. It is also higher in the private sector and in semipublic enterprises. None of the wage gaps is explained

by higher human capital endowments, and it is mostly due to higher premiums that men receive on their endowments compared with women—that is, a woman must be overprepared to gain the same wage for a given job as a man. From the lowest wage quantiles to the highest quantiles, this premium grows by almost four times, showing the magnitude of the glass ceiling faced by Tunisian women. In fact, wage discrimination against Tunisian women is no different from that in the rest of the world. Much like the conclusions reached by Arulampalam, Booth, and Bryan (2007), Pendakur and Woodcock (2010), and Zucco (2019), among others, Tunisia exhibits a high glass ceiling for women because they are required to be vastly more qualified than their male counterparts, especially for high-earning positions.

Second, this experiment creates an artificial supply of applicants, whereas in reality the rate at which females apply for jobs may differ from that of male job seekers. For example, in the engineering field it is plausible that female engineers submit fewer applications for actual engineering jobs and more for less demanding jobs in which the supply of female job seekers exceeds the demand for labor because of the inability of women to compete with men in view of their long working hours or other childcare and household responsibilities.¹⁷

Third, the higher concentration of female graduates than male graduates in some majors, such as marketing and finance, could mean there is an oversupply of female graduates for the number of jobs available in those fields, translating into higher unemployment rates among female graduates, even when there is positive discrimination in favor of women.

Fourth, the positive discrimination in favor of women could be related to how the profile of advertised jobs in some fields may fit certain gender stereotype beliefs held by employers. For example, many of the jobs advertised on the online portal for the finance field were for assistants, and a higher share of marketing jobs required knowledge of Microsoft Office and less advanced computer skills, as well as languages. This finding is in line with evidence found elsewhere. According to the World Economic Forum (2016), the IT industry has a significant gender gap in female hires, whereas women are more highly represented in sectors related to services.

¹⁷ Unfortunately, no data are available to further verify this hypothesis. Implementing panel surveys in the future to carefully track the choices of graduates over time would be a good first step.

Finally, other constraints from the supply side related to higher reservation wages could explain the high unemployment rate for female job seekers. It is influenced by high opportunity costs, especially because of preferences for public sector employment, the working conditions in the private (informal) sectors, and other explanations presented in section 3 of this report. Female unemployment in Tunisia is thus a complex challenge and cannot be fully explained by one factor alone. Closing the gender gap in employment requires a comprehensive, multisectoral approach aimed at tackling binding constraints from both the demand side and the supply side.

Policy implications: Addressing discrimination in the Tunisian labor market

In the IT sector, where discrimination is widespread, it is important to undertake prevention measures. Enacting laws that prohibit any form of discrimination in employment is an important first step. Tunisia currently scores 75 on the World Bank's Women, Business, and Law index,¹⁸ indicating that the country's economy gives women only three-quarters of the legal rights of men. Although this average is significantly higher than the MENA average of 47.37, there is room for improvement.

Currently, Tunisia's laws do not mandate equal remuneration for work of equal value, and women are not allowed to work in the same industries and same night hours as men.¹⁹ In addition, because this study finds that veiled women are 8.5 percentage points less likely than nonveiled women to receive a callback from employers, it is important to gradually influence the customs around inserting photos in applicants' resumes. More also needs to be done to ensure that women are not discriminated against at the interview stage or throughout their career progression based on their appearances, religious views, and family circumstances.

In instances in which discrimination in the workplace appears to be the result of statistical discrimination (for example, employers believe that female applicants are still, on average, less qualified or less productive than male applicants), Tunisia's National Employment Agency (Agence nationale pour l'emploi et le travail indépendant) could strengthen its labor market programs and job intermediation services between employers and job seekers, especially in workplaces where most workers are men. Offering internships and on-the-job training can serve

¹⁸ <https://wbl.worldbank.org/>.

¹⁹ World Bank, Women, Business and the Law database, 2019, <https://wbl.worldbank.org/>.

as a credible signal for employers and challenge some of their perceptions about women's productivity. In the IT sector, programs that promote skills training for women seeking to enter IT-related fields could be linked to the educational/vocational programs currently in Tunisia. Programs such as public information campaigns and career guidance services may also be needed to correct misperceptions about gender discrimination among students and their families and to encourage them to enroll in studies that tend to be male-dominated, such as engineering.

Moreover, it is important to implement targeted strategies to change (male) behavior in the workplace. Studies from the Organisation for Economic Co-operation and Development (OECD) found that in private enterprises, targeted strategies that champion leadership on gender issues from the top help to create opportunities for women through sponsorship, robust talent management, and a targeted search for female candidates for senior executive positions, who will, in turn, serve as positive role models for future generations of girls (Elborgh-Woytek et al. 2013). For example, in Norway, Kunze and Miller (2017) find narrower gender gaps in promotions for workers with female bosses, suggesting that policies that increase female representation in corporate leadership can have spillover benefits to women in the lower ranks.

Appendix

Table A.1 Total number of students enrolled in Tunisian universities by major and gender, 2018

Major	Number of students enrolled (all universities, public and private) for the academic year 2018	Number of female enrolled students	Number of male enrolled students
Training of trainers and education sciences	5,947	5,049	898
Arts	10,370	7,566	2,804
Letters	28,359	21,854	6,505
Business and administrative studies	45,912	29,947	15,965
Law	15,764	11,693	4,071
Journalism and information sciences	1,446	1,069	377
Social sciences and science of behavior	17,358	12,398	4,960
Mathematics and statistics	2,841	1,649	1,192
Computer science and multimedia	33,353	16,994	16,359
Life sciences	7,093	6,189	904
Physical science	9,847	7,471	2,376
Industry of transformation	3,447	2,794	653
Architecture and building	9,148	3,585	5,563
Engineering and related techniques	41,920	16,462	25,458
Veterinary science	283	204	79
Agriculture silviculture and halieutic	3,931	2,910	1,021
Health	25,851	18,651	7,200
Social services	867	748	119
Protection of the environment	1,232	1,013	219
Transportation services	1,630	1,113	517
Services to individuals	5,662	2,228	3,434
Total	272,261	171,587	10,0674

Table A.2 General characteristics of study job applicants

	Number of male applicants	Number of female applicants	Fraction of male applicants	Fraction of female applicants	P-value of fraction differences
<i>Applicant's appearance</i>					
Lighter-skinned (<i>base category: darker-skinned</i>)	776	752	0.50	0.48	0.37
Veiled women (<i>base category: nonveiled women</i>)	N/A	431	N/A	0.27	N/A
<i>Applicant's region of residence</i>					
Ariana	330	352			
Ben Arous	405	367			
Mannouba	231	225			
Tunis	605	627			
P-value of statistical differences in distribution of regions between men and women	0.38				

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