

Hiring discrimination of young people in the Paris area: Does a higher education degree compensate a North African origin?

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Abstract

Using the *correspondence testing* method we evaluate the extent of employment discrimination against young people of foreign origin (North African) in the Paris area, Ile-de-France. We measure the effect of ethnic origin (French or North African) and the crossover effect of the variable "ethnic origin" with the variable "educational degree"(qualification) on the chances of access to job interviews in response to vacancies for the profession of maintenance technician.

In order to conduct this study, we constructed three profiles of job seekers: two young men of North African origin and a young man of French origin. We have deliberately increased the productive characteristics of one of the two candidates of North African origin compared to the other candidates. Hence, one of the two candidates of North African origin shows a higher level of education than the other 2 candidates. He holds a higher level of diploma compared to the other two candidates. So, while the other 2 candidates hold a professional baccalaureate diploma (BAC) he holds a higher degree, a technician certificate (BTS = BAC+2).

We sent 441 applications in response to 147 job opportunities in the Paris area, over the period late July - late August 2010.

The results reveal discriminatory practices against the candidates of North African origin. These practices are only slightly offset by a higher education as the candidate most qualified of North African origin has less access to job interviews than the French candidate, but more than the other candidate of North African origin. We interpret these results by a statistical discrimination faced by young people of North African origin. While the educational degree increases the chances of access to job interviews, the North African origin remains however disadvantageous.

Keywords: hiring discrimination, field experiment, ethnicity, qualification, education degree.

JEL classification: C81, C93, J15, J71.

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1. Introduction

Discrimination against certain groups of the population is a major problem for our society and it is the subject of numerous studies. Evaluation of discrimination is complicated because of possibly unobservable or misidentified characteristics. Indeed, to avoid misuse of this concept, a precise definition of the concept of discrimination is required.

James Heckman (1998) speaks of a discriminatory situation when two workers with perfectly identical productive characteristics and which differ only by non-productive characteristics, do not receive the same benefits (access to employment, training, promotions, salary levels, etc..) from a company.

On the labor market, one speaks of discrimination in hiring when the job seekers are treated differently based on selection criteria that lack an objective and reasonable justification in respect of the vacancies to be filled.

The studies on the theoretical problem posed by discrimination start from a single definition of discrimination as differential treatment of workers with identical productivities. They can be classified into two main categories. The theories based on discriminatory preferences: employers have perfect knowledge of the productivity of individuals. It refers to the taste for discrimination (Becker, 1957) from employers (Bergmann, 1971, Arrow, 1973), other workers or consumers (Bergmann, 1971, 1974). The theories based on the idea that discrimination is a consequence of a lack of information for employers regarding the employee productivity: For Phelps (1972), the assessment of the productivity is based on individual signals. It refers to the statistical discrimination. For Arrow (1973), employers have beliefs based on observation or on prejudices in respect of the correlation between gender and performance.

All these different theoretical studies show that the identification and evaluation of the discrimination are difficult. A well adapted method is needed to adequately evaluate the discrimination in hiring because the data usually available (National Institute of Statistics and Economic Studies, INSEE, for example) are not sufficient. The data available to researchers are insufficient because the evaluation of discrimination is a complex exercise that involves comparisons "*all things being equal*". Available data usually raises the methodological problem of the inadequacy of administrative or survey data (characteristics of the candidates; unreliable statements from the employers or/and candidates; in reality two candidates for the same job are never identical). Using these data, we can not distinguish precisely whether the result of the recruitment process is the consequence of a difference in productive characteristics of the candidates or of discrimination in hiring.

As a solution to these difficulties, the *correspondence testing* is a suitable method that collects data using a controlled experiment and compares access to job interviews of different candidates by sending equivalent job applications (with the exception of the variable to test) to job vacancies. To compare the candidates' access to employment - for the applications that are retained by employers – one may choose to send false candidates for job interviews.

This method has, however, certain limits. The two most important limits to emphasize are the following. First, as the collected data are experimental ones, "it reliably indicates the extent of employment discrimination at a given period of time, within the field covered by the experiment but it can not provide under any circumstances an indicator of the state of discrimination on the overall labor market "(De Schutter, 2001; Duguet et al, 2007). Secondly, as Heckman (1998) pointed, it is difficult to isolate the discrimination that is based on aversion (the taste for discrimination) from the statistical discrimination. The results

obtained cannot be generalized across the labor market and their interpretation must be cautious.

The *testing* is used in the studies of employment discrimination against certain demographic groups of population over the past twenty years.

Riach and Rich (1991) perform in Australia a test of access to job interviews over the period 1983-1988. They compare the access to employment between indigenous and Greek and Vietnamese minorities in the state of Victoria. The types of jobs used in their study are white-collar employees, salespeople, and secretaries. Their results show that, in all the three activities, Greeks and Vietnamese faced a significant hiring discrimination. Next, discrimination appears lower for the Greeks (8.8%) than for the Vietnamese (27.4%).

Kenney and Wissoker (1994), in the United States, perform simultaneously in Chicago and San Diego a test to compare access to job interviews and to employment of Hispanic and Anglo-Saxon young men. Once the job applicants were selected by employers, the authors sent (false) job applicants to interviews. They used for their studies low-skilled positions. Their results show that discrimination occurs mainly in the access to interviews: although they found a significant discrimination against Hispanic candidates in the access to job interviews, the discrimination decreases when passing the job interview.

More recent studies treat the cumulative effect of the ethnic origin with other variables.

Bertrand and Mullainathan (2004), in the United States, perform in Chicago and Boston, a *correspondence testing* using white and black candidates of Anglo-Saxon or African American origin. The ethnic origin of job applicants is indicated on the job application by the high-sounding Anglo-Saxon or African American first name (Emily Walsh and Greg Baker versus Washington Lakisha and Jamal Jones). The authors used in their study commercial or administrative jobs (cashier work at retail establishments, clerical work in a mail room, office and sales management positions). Their results show significant discrimination against black applicants. Furthermore, they show that only whites are advantaged by higher quality résumés such as: more labor market experience and fewer holes in their employment history, foreign languages skills, honors, some military experience, summer schools or work experience during school, volunteer experiences and computer skills.

In France, Cediey and Foroni (2007) conducted at Lille, Lyon, Marseille, Nantes, Strasbourg and Paris a study for the International Labour Office (ILO): "*Discrimination due to the ethnic origin in hiring in France: a national survey by testing by the method of the ILO*". The *testings* were conducted over the period late 2005 - mid 2006 using jobs with low and medium-low qualifications in the fields of catering, sales and trade, business services or communities, personal services, transport, reception and secretarial, construction and public works, health and social action. The ethnic origin of candidates is indicated on the résumés by the North and black African and old French high-sounding first and last name. They find a clear discrimination against North and black Africans.

Duguet E., N. Léandri, Y. L'Horty and P. Petit (2007) perform a testing for job interviews access by measuring simultaneously the effects of place of residence (privileged or underprivileged city), nationality (French or Moroccan) and consonance of surname and of forename on the chances of obtaining a job interview. They used the profession of waiter and accountant. They find that, in both professions, displaying a Moroccan-sounding surname is more penalizing than displaying Moroccan nationality on a résumé. Furthermore, they show a differential discrimination against Moroccans depending on the profession. Indeed, the authors find that for a waiter position, the chances of getting a job interview are at least 3 times greater for the native applicants than for the applicants with a Moroccan origin or nationality. For accounting positions, these differences appear stronger ("*The applicants with*

a Maghreb nationality and origin must send on average ten times more résumés to get as many invitations to job interviews that the applicants whose names evoke a French origin”).

More recently, Duguet E., Y. L'Horty, L. du Parquet, P. Petit, F. Sari (2011) evaluated the combined effects of the origin (French, North African, Sub-Saharan African and Asian) and gender on the chances of access to job interviews. They used for their study high-skilled positions of informatician baccalaureate (BAC) +5 level. They find that the French of foreign origin have a lower probability of access to job interviews regardless of their gender.

As in the study of Bertrand and Mullainathan, in our study we are also increased the quality of resumes but just for a certain applicant. Thus, a certain candidate indicates on the resume a higher education (an additional degree) because according to the human capital theory the chances of access to employment increases with the educational level. In comparison, Bertrand and Mullainathan have granted foreign language skills, honors or some military experience, summer schools or work experience during school, volunteer experiences, additional skills in computer science.

Contributions of our study:

This study aims to evaluate the results of a test of the access to job interviews of young men of French and North African origin in order to highlight the possible existence and extent of discriminatory practices against persons of foreign origin (North African). *First, we innovate by the fact that we have voluntarily increased the productive characteristics of one of the candidates compared to the other candidates.* Since reference studies have demonstrated the existence of discriminatory practices against people of North African origin, we left the field "all things being equal" and we have deliberately increased the productive characteristics of one of the two candidates of North African origin.

Thus, a first candidate of North African origin shows on his job application a higher educational level than other candidates. A second candidate of North African origin shows on his job application a baccalaureate diploma, as well as the third candidate of French origin.

The origin of the candidates is signaled on the job applications by the North African-sounding name and surname, respectively by the French-sounding name and surname. All other features of the candidates are similar. Thus, the last two candidates differ one from the other only by the unproductive characteristic "ethnic origin". However the first candidate is different from the other candidates also by a productive feature, a higher educational degree, conducted to enhance his chances of employment.

In this context, we seek to answer the following questions: if a French of North African origin has a higher educational degree than a native French, what is the effect on his chances of access to employment? Are we going to find an employment discrimination against the candidate of North African origin and if so, at what level?

We innovate also by the fact that we have checked if there is discrimination in the order of the responses made to the candidates. This approach is to our knowledge not yet exploited.

The three types of applications were therefore built to be sent in response to the same vacancies in the same companies. We sent 441 answers to 147 job opportunities over the period late July - late August 2010 using the site "employment center". The types of employment used in this study are skilled jobs (technician certificate, professional baccalaureate) in the business of maintenance, the profession of maintenance technician.

2. The experiment

Nature of the experiment

We tested the variable ethnic origin suggested on the resumes by the French or North African-sounding name and surname of the candidates (Table 1). This variable is tested taking into account the increased productive characteristics of one of the two candidates of North African origin: one of them has an additional degree of Higher Technician Certificate (BTS = baccalaureate +2) compared to the other two candidates.

All the other features are similar but not completely identical in order to limit the risk of detection by recruiters.

Table 1
Ethnic origin of applicants

Applicant	Nationality	Ethnic origin	Name and surname sounding
1 (FMM)	French	North African	North African
2 (FMM)	French	North African	North African
3 (FFF)	French	Française	French

FMM: French nationality, Moroccan name and forename; FFF: French nationality, name and forename.

Construction of the applications

We tested access to job interviews for the profession of maintenance technician in electrical engineering field.

The maintenance technician profession is a profession for which there are recruitment difficulties. According to several monthly newsletters on the labor market in Paris area, *Ile-de-France*, (No. 26, August 2006; No. 37, July-August 2007; No. 43, August 2008; No. 45, February 2009) recruitment difficulties appeared particularly in the fields of the building maintenance, cooking and health. The share in hiring of maintenance technicians considered difficult increased from 59.4% to 75.2% over the period 2006 to 2008.

The great demand for maintenance technicians and the recruitment difficulties registered in this field makes this profession a highly sought one from the employers. In addition, specialization in electrical engineering allows us to access a wide range of jobs: electrical engineer, electromechanical; (building) maintenance technician/officer; technician specialized in electronical tests; technician specialized in installations of electronic equipment; industrial maintenance technician). These reasons should normally limit discriminatory practices and the employer's refusal for for the applicants in this job field.

We have chosen to test the effect of North African origin on the chances of access to job interviews because, according to several studies on this subject, the greatest difficulties to access to employment are experienced by individuals originating from these countries and by their descendants (Richard J. L., 2006; Silberman R. and Fournier I., 2006, Duguet and authors, 2007). Thus, although the variable «*ethnic origin*» (in our case the North African origin) is a non productive characteristic it seems to generate discriminatory practices. But

what will happen when a productive characteristic "*enter in the game*" to enhance the chances of a North African originating applicant?

To answer this question, we chose to adapt our approach and to vary the variable "*educational level*" between the candidates (Table 2). Hence, we built three job applications that can form three pairs of applicants.

Table 2

Qualification of candidates

Applicant	Profession	Qualification
1 (FMM)	Maintenance technician	Higher Technician Certificate in electrical engineering field (BTS = baccalaureate +2) Professional baccalaureate in electronics, energy, and communication equipment (Bac Pro = BEP + 2) Certificate of Professional Studies in electronics (BEP)
2 (FMM)	Maintenance technician	Professional baccalaureate in electronics, energy, and communication equipment (Bac Pro = BEP + 2) Certificate of Professional Studies in electronics (BEP)
3 (FFF)	Maintenance technician	Professional baccalaureate in electronics, energy, and communication equipment (Bac Pro = BEP + 2) Certificate of Professional Studies in electronics (BEP)

In the first pair, the candidates differ by ethnic origin suggested on the application by the consonance of their names. Both candidates have French nationality but one of them displays a North African sounding name and surname. The full name displayed by the other candidate suggests a French origin. Both candidates have a resume of equivalent quality and therefore they display similar productive characteristics (same qualifications of BAC level, same professional experiences).

Similarly to the first pair, the candidates of the second pair are differentiated by ethnic origin (North African and French) and, particularly for the candidate of North African origin, by his higher educational level. Hence, the candidate of French origin indicates on his resume a BAC degree while the candidate of North African origin indicate on his resume a superieur BTS degree. All the other features are similar for the two applicants.

The last pair is formed by two candidates of North African origin, one displaying a higher education level (BTS versus BAC degree) than the other.

If, under these circumstances, we find a preference for the candidate of French origin who is less qualified, this would suggest a very large level of discrimination against people of North African origin. On the contrary, if we find a preference for the North African originating candidat who is most qualified, this would suggest an economically rational response from the employer given the higher qualification of the candidate.

Using these three pairs of applicants, we aim to find and analyze what are the chances of access to job interviews for a North African originating candidat relative to a candidate of French origin which holds equivalent or lower productive characteristics.

The choice of names and surnames of the candidates is made by taking into account their ethnic origins and their ages. Hence, we chose French and North African highly-sounding names and surnames which were extensively used at the time of their birth (Table 3).

Table 3
Identity of the candidates

Applicant	Name and surname	Name and surname sounding	Gender	Qualification
1 (FMM)	MESSAI Zahid	Maghrébine	Male	BTS
2 (FMM)	BELAHDEB Nessim	Maghrébine	Male	BAC
3 (FFF)	BERNARD Sylvain	Française	Male	BAC

All other characteristics are similar, as follows.

The similarities:

We mention that all similar characteristics are formulated differently on each resume, in order to limit the risk of detection. For example, age is displayed directly for one of applicants. For the other two, the age is suggested by the date of birth or by the year of birth.

The three candidates are young men of French nationality, single and childless. All three are aged 28 years. They all live in Paris area, *Ile de France*, in economically and socially similar cities (Table 4), in order to limit the risk that the place of residence has an influence on the choice of the recruiter.

Table 4
Place of residence of applicants

Applicant	Place of residence	Zip code
1 (FMM)	Bondy	93140
2 (FMM)	Le Blanc Mesnil	93156
3 (FFF)	Noisy-le-Sec	93130

They all hold a driving license and they indicate mobility in the Paris Area *Ile-de-France* on their job applications. In accordance with their age, they have an extensive experience of approximately twelve years. This experience is similar for the three candidates who have held the same types of work positions with equivalent tasks.

The three candidates show no significant interruption in their work and they work on similar positions at the time of application.

The differences:

The three candidatures (resume and cover letter) are differentiated by elements of page layout: the font, the font size and color, the type of resume and the layout of page content.

They differ also by their mobile phone operator and by their email address. Hence, each candidate has a mobile phone number and email address on different operators (Yahoo, Gmail, Hotmail).

The applicants have a professional experience in different firms located in different areas of *Ile-de-France*.

Hobbies and extra-professional interests is a number section of the resume that can give rise to interpretations of the character of the applicants and their possible behavior. Consequently, it appears neutral but different such as team sports, reading and music.

Furthermore, as we have already indicated one of three candidates displayed an additional degree relative to the others.

Thus, applications are built similar, plausible and realistic.

A test of access to job interviews

Our research seeks to evaluate the effect of ethnic origin (North African and French) on the chances of obtaining a job interview. In order to do this, we sent 441 applications (CVs and cover letters) in response to 147 job opportunities (ads) in the Paris area between late July - late August 2010.

We have not sent candidates for job interviews therefore the results only show access rates to job interviews, which is "*a proxy for access to employment*" (Duguet and authors, 2007).

One might think that the test of access to job interviews is limited because the access to job interviews does not guarantee the job. However, organizing an interview has a cost for the employer and if he decides to call a candidate, it means that he has a chance of getting the job. Furthermore, many studies (Kenney et Wissoker, 1994; Neumark et al. 1996; BIT, 2007; Cediey and authors, 2008, by exemple) show that discrimination first appears at access to job interviews.

The choice not to send candidates for interviews gives us the advantage of complete control over the course of our study. The physical appearance and personality of the candidates that are uncontrollable elements by the researchers did not influence the test results. Furthermore, this choice simplifies data collection which gives us the possibility of establishing a larger sample (Riach and Rich, 1991).

Sources of vacancies and submission of applications

We established our sample by consulting the website of the Centre of Employment (the government-run employment Agency) which centralizes most of the vacancies in France.

We responded to job offers a few days after they were published on the website. The applications were sent over the period late July - late August 2010, in response to job offers that match the profile of the (buildings) maintenance technician.

As the applications were sent to the same job, we chose to send them with a delay of approximately 45 minutes from one another from the different email addresses of each candidate in order to limit the risk of detection. To avoid influencing the choice of firms for a particular applicant, the applications were sent in by a systematic rotation thus the order of each application (CV and cover letter) was different (rotating) for each sending.

To avoid a potential effect of the form or the content of the job applications on the employer's responses, we used a system of regular rotation between the identities of applicants and the written job applications (resume and cover letter).

Hence, we used simultaneously the two methodological approaches (application's submissions by a regular rotation and permutations between the identities of applicants and written job applications) in order to construct a dataset as reliable as possible.

We have answered all the vacancies in adequacy with the qualifications and experience of the applicants wich satisfied the following criteria:

- Type of contract: any contract (Fixed-term, indefinite-term or temporary contract);
- Positions located throughout the *Ile de France* (mobility throughout the whole region);
- Industry (fied) : Electrical Maintenance.

Processing the employers' responses

The responses were processed as positive if the recruiter invited the candidate to an interview or if he asked for more information about the professional situation of the candidate. The responses were processed as negative if the recruiter formally rejected the application or if there was no response from the recruiter.

3. Test Results

Among 147 companies that have received applications, 28% (41 firms) sent a positive signal to the candidates by proposing a job interview or requesting additional information. The average success rate per applicant reveals however disparities between them. According to their ethnic origin and education level (degree) we found a large gap between the applicants (Table 5).

Table 5
Success rate in accessing employment interviews

Ethnic origin	Qualification	No. of observations	Success rate (%)
North African	BTS	147	19,05
French	BAC	147	23,81
North African	BAC	147	14,29

From a total of 147 applications submitted, the French originating applicant, having a BAC degree, received 35 positive responses versus 21 positive responses for the North African originating applicant with similar productive characteristics and therefore the same level of education (BAC degree). The North African originating applicant with a higher education level Bac +2, so a BTS degree, received 28 positive responses. Therefore he received more positive responses compared to the other North African originating applicant. Nevertheless, compared to the French originating applicant, he received less positive responses (Table 6).

Table 6
Number of positive responses versus negative responses

Ethnic origin	Qualification	No. of observations	Positive responses	Negative responses	No answers	Total negative responses
NorthAfrican	BTS	147	28	13	106	119
French	BAC	147	35	6	106	112
North African	BAC	147	21	20	106	126

From a total of 147 applications submitted, the candidate of French origin, having a BAC degree, received 35 positive responses and 112 negative responses. Among these 112 negative responses, 106 represent firms that have not responded to any applicant.

Thus, we observe there are two distinct effects. First, the BTS qualification provides more chances to obtain job interviews (comparing the North African originating applicant with a BTS degree to the other North African originating applicant with a BAC degree). However, the French originating applicant with a BAC degree succeed only with his old French origine to fill his inferior qualification relative to the North African originating applicant with a BTS degree.

Number of applications in order to be invited to a job interview

The native French candidate receives 1 invitation to a job interview for an average of 4 resumes sent versus 7 resumes sent for the North African originating candidate with the same productive characteristics. The North African originating candidate with higher qualification must send 5 applications in order to receive 1 invitation to a job interview. Thus, although he has higher qualifications than the native French applicant, he must send more applications in order to obtain the same result. These results suggest a significant discrimination on the labor market, with differences according to ethnic origin and qualifications (degree) of the applicants (Table 7).

Table 7

Number of applications in order to be invited to a job interview according to the candidate's profile

Ethnic origin	Qualification	No. of observations	Positive responses	No. of applications to obtain 1 job interview
NorthAfrican	BTS	147	28	5
French	BAC	147	35	4
North African	BAC	147	21	7

The candidate of North African origin with higher qualification (BTS) must send 5 applications in order to be invited to a job interview.

In other words, depending on their ethnic origin, significant gaps appear between the applicants: the native French applicant has an average 1.75 more odds to obtain a job interview than the applicant with North African origin all other characteristics being equal or similar. This gap has a tendency to decrease, but it's still present, when comparing the native French applicant with the applicant with North African origin with higher qualification. Thus, although he has higher qualifications, the North African originating applicant has yet fewer odds (1.25) to obtain a job interview than candidates of French origin.

Study of discrimination by pair

We describe in this section an analysis by pair: We note "A" the applicant of North African origin with a BTS degree, "B" the applicant of French origin with a BAC degree and "C" the candidate of North African origin with a BAC degree .

Analysis of the pair AB

Being more qualified does not seem to "compensate" having a North African origin

Analyzing the pair formed by applicants A and B we find a net discrimination of 4.76%. This discrimination is relatively high given the fact that the most qualified applicant is the one originating from North Africa (Table 8).

An equal result between the two applicants would have been a presumption of discrimination as it is expected that the applicant with the better qualifications, therefore with a potentially higher productivity, should obtain more job interview invitations. Being more qualified does not seem to "compensate" having a North African origin for recruiters.

Table 8

Net discrimination - Couple AB: Ethnic origin and qualification

Explanation	"NO" to 2	"YES" to 2	"NO" to A "YES" to B	"NO" to B "YES" to A	Total Sample	Net discrimination
Total number	107	23	12	5	147	0,0476
Percentage	72,79	15,65	8,16	3,40	100,00	4,76* (1,71)

*Statistical significance levels *: Significant at 10%; **: Significant at 5%. ***: Significant at 1%.*

From a total of 147 firms, 107 responded negatively and 23 responded positively to the 2 candidates. 12 firms responded negatively to the candidate of North African origin (A) and positively to the candidate of French origin (B). 5 companies responded negatively to the candidate of French origin and positively to the other candidate.

Analysis of the pair BC

North African origin is highly discriminatory

The analysis of the pair BC indicates a net discrimination of 9.52% against the applicant of North African origin (Table 9). In this case, discrimination is well above than the one of the North African originating applicant with a higher degree. Remember however that, without discrimination, the results of access to job interview should have been identical for the two candidates B and C as their productive characteristics are equivalent.

Table 9

Net discrimination - Couple BC: Ethnic origin

Explanation	"NO" to 2	"YES" to 2	"NO" to B "YES" to C	"NO" to C "YES" to B	Total Sample	Net discrimination
Total number	110	19	2	16	147	0,0952
Percentage	74,83	12,93	1,36	10,88	100,00	9,52*** (3,42)

*Statistical significance levels *: Significant at 10%; **: Significant at 5%. ***: Significant at 1%.*

Analysis of the pair AC

A higher qualification provides a better chance to obtain a job interview

Analyzing the last pair AC, we find a net gap of 4.76% (see Table 10). This gap is not due to discrimination as the only different characteristic between the 2 applicants A et C is a productive variable (the qualification). Fairly logically, recruiters prefer the applicant with higher qualifications.

Note that this difference should have been similar, relative to the pair AB, between A and B (the native French applicant) yet the effect was opposite as we have seen in the analysis of the pair AB.

Table 10

Net gap - Pair AC: qualification

Explanation	"NO" to 2	"YES" to 2	"NO" to A "YES" to C	"NO" to C "YES" to A	Total Sample	Net gap
Total number	113	15	6	13	147	0,0476
Percentage	76,87	10,20	4,08	8,84	100,00	4,76 (1.61)

*Statistical significance levels *: Significant at 10%; **: Significant at 5%. ***: Significant at 1%. Note that the net gap of 4.76% is at the borderline of being significant at 10%.*

Hierarchy in the order of answers to applicants

We sought to see whether discrimination exists in the order of answers made to candidates. Therefore, we statistically and econometrically treated the sub-sample of 41 firms that responded positively to the applicants in order to find if there are preferences in the order of answers made to the applicants.

Among these 41 firms, 14 responded positively to the 3 applicants, 15 responded to 2 applicants and 12 responded to a single applicant.

14 firms have therefore contacted the 3 applicants. Among them:

- Only one firm has contacted the most qualified applicant in a first position one week in advance compared to the others applicants.
- One firm first contacted the native French applicant one day in advance compared to the other applicants.
- Two other firms contacted the North African originating applicant with a BAC degree with a delay of 4 days compared to the other two candidates. Thus, for at least four days, two firms have not even considered the candidate of North African origin with equivalent productive characteristics to the native French applicant.

The 10 other firms have contacted all 3 applicants on the same day, with only a few minutes or seconds delay. Thus, only 24% of the 41 employers have chosen to invite all applicants for job interviews. However, 9 of these 10 recruiters first contacted the native French applicant. Similarly, he was contacted in first position 10 times out of 14 firms (72%).

We note therefore a high disparity in the order in which the applicants are called by recruiters. The most qualified applicant is called only three times in the first position while the native French applicant is called 10 times in the first position. The other applicant of North African origin who has a BAC degree is contacted in the first position only once a few moments before the other two candidates (Table 11).

Table 11
Number of times of being contacted in first position

Number of firms	A (Bts)	B (Bac)	C (Bac)
14	3	10	1
23	7	15	1
19	3	14	2

Among of the 14 firms that responded positively to three candidates, 10 of them contacted in the first position the native French applicant..

To further detail this pattern, we decided to analyze the number of times when the North African originating applicant with BTS (A) and native French applicant with BAC (B) are first called when both are called by the same firms. And the tendency continues, the native French applicant is called in first position 15 times out of 23 (14 firms who have called the 3 applicants and 9 firms that contacted only the candidates A and B) versus the other applicant (A) which was contacted in first position only 7 times.

Finally, we analyzed the number of times the North African originating applicant with BAC (C) and the native French applicant (B) are called first, when both are called by the same firms. The tendency is without ambivalence, the native French applicant is first contacted 14 times out of 19 (14 firms which have called the three candidates and 5 firms which have contacted only the applicants B and C) versus the other applicant (C) which was contacted in first position only twice (Table 11).

Table 12
Hierarchy in the order of answers to applicants

Hierarchy: the case in which all 3 applicants are contacted				
Hierarchy	A	B	C	Total firms
1st contacted	3	10	1	14
2nd contacted	7	2	5	14
3rd contacted	4	2	8	14

Hierarchy: the case in which at least 2 applicants are contacted				
Hierarchy	A	B	C	Total firms
1st contacted	8	19	2	29
2nd contacted	12	7	10	29
3rd contacted	4	2	8	14

Hierarchy: the case in which at least 1 applicants is contacted				
Hierarchy	A	B	C	Total firms
1st contacted	12	26	3	41
2nd contacted	12	7	10	29
3rd contacted	4	2	8	14

Only 14 firms have contacted the 3 applicants; 29 firms have contacted at least 2 applicants and 41 firms have called at least 1 applicant. Among the 41 firms that have contacted at least 1 applicant, 12 first contacted the applicant A (BTS), 26 first contacted the applicant B and only 3 firms first contacted the applicant C.

By analyzing the hierarchy of contacts and how many times each candidate is contacted in the first, second or third position, the tendency is clear: the native French applicant is predominantly first contacted (Table 12). He is visibly the most first contacted in all three cases. Among the 41 firms he is first contacted 26 times versus just 3 for the North African originating applicant with similar productive characteristics and 12 times for the North African originating applicant with higher qualifications.

Study of discrimination in the order of answers to applicants by pairs

Another approach is to measure the preference for one of three candidates, not just by the number of times to be called in first place but by the number of times to be preferred by pair of candidates. We therefore sought to see which candidate is called before the other for each pair of candidates (see Table 13). To achieve this, in each pair, we considered as "preferred candidate":

- The applicant contacted before the other applicant by the analyzed pair.
- The applicant being the only one contacted by the recruiter.
- The applicant contacted together with the third applicant who is outside the analyzed pair.

Table 13

Call order - preferred applicant

Couple	Sample	1 ^{er} vs 2 ^e	2 ^e vs 1 ^{er}	Net gap (%)	p value
AB	40	13	27	35,00**	0,02
BC	37	32	5	72,97***	0,00001
AC	34	23	11	35,29**	0,03

Binomial test of equal treatment.

*Significance levels *: Significant at 10%; **: Significant at 5%; ***: Significant at 1%.*

Among 40 firms that contacted at least 1 of 2 applicants of the pair AB, 13 contacted the North African originating applicant(A) before the native French applicant (B), 27 firms contacted the native French applicant (B) before the North African originating applicant (A). We conclude that there is a net gap of 35% between the 2 applicants in the favor of the native French applicant with a probability of committing an error of 0.02.

Pair AB: ethnic origin + qualification effects

40 firms contacted at least 1 of 2 applicants A and B. The sample is composed as follows:

- 14 firms contacted the 3 applicants A, B, C.
- 9 firms contacted on the 2 applicants A and B.
- 7 firms contacted only the native French applicant (B before A).
- 4 firms contacted the North African originating applicant with BTS (A before B).
- 5 firms contacted the applicants B and C (B before A).
- 1 firm contacted the applicants A and C (A before B).

From the sample of 40 firms that have contacted at least 1 of 2 applicants of the pair AB, the native French applicant was contacted 27 times before the North African originating applicant, knowing that the last one had higher qualifications. He was contacted just 13 times before the native French applicant.

We have found a significant gap of 35% between the two applicants. Employers prefer the native French applicant with a BAC degree in the detriment of the second North African originating applicant, despite the higher level of diploma (BTS) held by the last one.

Pair BC: ethnic origine effect

37 firms contacted at least 1 of 2 applicants B and C. The sample is composed as follows:

- 14 firms contacted the 3 applicants A, B, C.
- 5 firms contacted only the 2 applicants B and C.
- 7 firms contacted only the native French applicant (B before C).
- 1 firm contacted only the North African originating applicant C (C before B).
- 1 firm contacted the applicants A and C (C before B).
- 9 firms contacted the applicants A and B (B before C).

From the sample of 37 firms that have contacted at least 1 of 2 applicants of the pair BC, the native French applicant was contacted 32 times before the North African originating applicant, both having the same productive characteristics. The North African originating applicant was contacted just 5 times before the native French applicant.

We have found a significant gap of 75,97% between the two applicants. Employers prefer manifestly the native French applicant in the detriment of the second North African originating applicant.

Pair AC: qualification effect

34 firms contacted at least 1 of 2 applicants A and C. The sample is composed as follows:

- 14 firms contacted the 3 applicants A, B, C.
- 1 firm contacted the applicants A and C.
- 4 firms contacted only the highest qualified applicant A (A before C).
- 1 firm contacted only the North African originating applicant C (C before A).
- 5 firms contacted on the 2 applicants B and C (C avant A).
- 9 firms contacted the applicants A and B (A before C).

From the sample of 34 firms that have contacted at least 1 of 2 applicants of the pair AC, 23 firms contacted first the highest qualified applicant A. The gap being significant, we conclude that in this case employers prefer the highest qualified applicant.

A presumption of statistical discrimination in the access to job interviews...

All these results indicate the specific effects of the ethnic origin. The first conclusion is that of the extent of discrimination against of the young man of North African origin. *According to their ethnic origin, we found a significant gap between the candidates which is only slightly reduced by a higher qualification.* The applicant having a North African origine must send in average almost twice as many applications to get as many invitations to job interviews as the applicant whose full name evoke a French origin, both having the same productive characteristics. The higher qualified candidate having a North African origine must send 1.25 times more applications than the applicant having a French origin while normally he should have access to hiring interviews more easily.

The second conclusion is that the gaps are different depending on the qualification of applicants having a North African origin: the less qualified applicant is much more discriminated that the higher qualified applicant. However, the last one does not even have equal opportunities in hiring as the less qualified applicant having French origin.

...but also in the order of contacting the applicants by the recruiters

Another element which strikes us in this study is, when more than one applicant are contacted for job interviews, the first contacted is predominantly the applicant having a French origin. One can legitimately wonder if the applicants having a North African origin would have been contacted if the French candidate had responded positively to the interview invitation. Isn't discrimination stronger than it is shown by these simple rates of access to job interviews?

With the reservation that it is difficult to distinguish statistical discrimination of discrimination related to preferences, these gaps can be explained by a statistical discrimination faced by young people having a North African origin. We found a qualification effect which increases only partially the chances of obtaining a job interviews when one has a North African origin. Hence, the higher qualified applicant having a North African origin has fewer odds in the access to job interviews than the native French applicant but more than the other applicant having a North African origin. It is therefore possible that employers associate applicants having a North African origin to a specific group based on average characteristics, real or imagined, relative to their productivity. In spite of the fact that a higher qualification increases the chances of accessing to job interviews, the North African origin remains however disadvantageous.

These results suggest a significant discrimination on the labor market, with different gaps according to ethnic origin but they reliably indicate the magnitude of the accessing to job interviews discrimination at a given period of time (late July - late August 2010) and within the field covered by this experiment (maintenance technician profession) in the geographical context of the Paris area *Ile-de-France*.

The study could benefit from the following research perspectives. It would be interesting to extend this study to a larger number of applications and to different professions in order to confirm the tendencies found on our sample. It would also be suitable to study the impact of different qualification levels on access to job interviews (Bac, BTS, License, Master, ...). Another interesting approach would be to extend the study by adding data location (residence in a underprivileged city, residence in a privileged one ...) and analyze the cross effect of these variables. From a theoretical point of view, it would be interesting to model the discrimination related to the original conditionally to the applicants' qualification. Finally, regarding the results found relative to the order of the responses to the candidates, an interesting study would be to continue this analysis with a model.

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