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Clémence Berson, Morgane Laouenan, Emmanuel Valat. Outsourcing recruitment as a solution to prevent discrimination: A correspondence study. 2020. hal-03455920

HAL Id: hal-03455920

<https://sciencespo.hal.science/hal-03455920>

Preprint submitted on 29 Nov 2021

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LABORATOIRE INTERDISCIPLINAIRE
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LIEPP Working Paper

February 2020, n°104

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www.sciencespo.fr/liepp

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How to cite this publication:

BERSON, Clémence, LAOUENAN, Morgane and Emmanuel VALAT, **Outsourcing recruitment as a solution to prevent discrimination: A correspondence study**, *Sciences Po LIEPP Working Paper* n°104, 2020-02-06.

Outsourcing recruitment as a solution to prevent discrimination: A correspondence study*

Clémence Berson, Morgane Laouénan and Emmanuel Valat

Abstract

In this work, we assess how organization of recruitment in large companies affects ethnic discrimination. We consider large multi-establishment companies and distinguish two types of organization of recruitment: hiring made through a human resources (HR) department at a centralized level of the company and hiring made only at the level of the establishment concerned by the position, generally by managers in charge of recruitment. Our results indicate that access to a centralized HR department in the selection of applications has an important effect on the level of discrimination: This type of organization of recruitment results in a significant decrease in the probability that the applicant of presumed "French" origin is selected alone.

Keywords: Hiring discrimination, large companies, North African origin, organization of human resources.

JEL Classification: A13, C93, J21, J71, J78, O15.

*We would like to thank Anthony Edo, Corinne Prost and Marie Ruault for their relevant comments as well as Fabrice Foroni and Eric Cédiey of ISM-Corum. We would also like to thank the participants of the DARES seminar, INSEE inequality seminar, University Paris 1 - Panthéon - Sorbonne seminar, Swedish Institute for Social Research (SOFI), LAGV conference and EALE conference. We also thank the DARES for providing data. We gratefully acknowledge financial support from ANR within the *INEQ AT WORK* project (ANR-17-CE41-0009) and from Sciences-Po LIEPP (ANR-11-LABX-0091, ANR-11-IDEX-000502). All errors are our own.

1 Introduction

In France, as in many countries, several experiments conducted in recent years have revealed a relatively widespread discriminatory behavior among employers (see [Rich \(2014\)](#), [Baert \(2017\)](#), [Bertrand and Duflo \(2016\)](#) and [Neumark \(2018\)](#)) for literature reviews). Discrimination in hiring related to origin is among the most commonly studied because it is easier to measure from experimental schemes than other types of discrimination (e.g., age, disability, or physical appearance). In France, several correspondence studies have revealed that workers of "North African" origin are particularly concerned by the phenomenon ([Feroni and Cediey \(2008\)](#), [Petit et al. \(2015\)](#), [Berson \(2013\)](#), and [Edo and Jacquemet \(2013\)](#) among others)¹. With similar characteristics, applicants of "French" origin are up to three times more likely to receive positive callbacks from employers than applicants of "North African" origin, depending on the characteristics of the experiment (e.g., jobs, period, or characteristics of applicants). Several recent works have studied different actions to prevent discrimination, and some have been in the French context. [Behaghel et al. \(2015\)](#) show that setting up an experimental anonymous resume policy for some vacancies is not efficient for ethnic minorities. [Fremigacci et al. \(2015\)](#) assess the potential impact of merit labeling by making the "best apprentice in France" distinction appear on the resume. However, this attempt was not effective in reducing discrimination because, although everyone benefits from this distinction, applicants of "French" origin benefit more than other groups. [Edo and Jacquemet \(2013\)](#) evaluate the impact of a satisfactory level of French on resumes. Their results are more encouraging than the results in the literature because such a signal makes it possible to reduce the differences observed. However, overall, few tools have proven effective in fighting discrimination in recruitment. In a 2016 literature review, [Bertrand and Duflo \(2016\)](#) confirm this observation and stress that more research on this point is worth pursuing.

In this article, we assess the effect of the organization of recruitment in large companies on the degree of hiring discrimination. More specifically, we compare the intervention of a centralized human resources (HR) department to the selection made only within the establishment concerned by the position, generally by a manager responsible for recruitment. Notably, HR professionals are better trained and more aware than other recruiters regarding discrimination. HR professionals are

¹French worker with a "North African" sounding name. Similarly, "French" origin designates a French worker with a "French" sounding name.

also less influenced by local constraints that can generate discrimination (e.g., conforming to consumer preferences or seeking to maintain homogeneous teams to facilitate their management). Finally, HR professionals also have more time to devote to the selection of applications and therefore make their choices less often on the basis of ethnic stereotypes (Chugh, 2004).

To conduct our study, we use the data from a correspondence study realized by the Ministry of Labor. The aim was to establish a dialogue with each company on their recruitment practices on the basis of experimental results and encourage them to implement policies to prevent discrimination. This dialogue was an opportunity to gather information related to the recruitment process for each job offer, in addition to those related to the experience design. Thus, we distinguished recruitment for which the selection was made through a centralized HR department of the company (e.g., at national and regional levels), by an external service provider, or by a person in charge of hiring if the recruitment was managed at only the level of the establishment the offer concerns. The data from this testing have so far been used to provide only raw results to the companies concerned. (Feroni et al., 2016) show the outline of the protocol and the results by gender and level of employment (manager or employee).

In this paper, we evaluate the impact of centralized HR recruitment on the degree of discrimination in large companies. Approximately two thirds of the tested job offers are managed in this manner, the other job offers are managed solely at the establishment level. Notably, because we consider very large companies, the organization of recruitment varies across job offers and not only across companies. Indeed, data show intra-firm heterogeneity in terms of recruitment organization for many companies. Next, because the organization of recruitment is potentially endogenous, we use an instrument to evaluate a causal effect. We exploit the information regarding whether the tested job offer is from a company that developed a franchise network or from a franchisee. The belonging of the establishment (or the brand in the case of a franchise) to a company with a franchise network leads to an exogenous increase in the probability that the selection only occurs within the establishment concerned. On the one hand, the existence of franchises is linked to a culture/practice of institutional autonomy for the enterprise as a whole; on the other hand, the franchised establishments are enterprises and have full independence beside the parent company. Moreover, according to the literature (Blair and Lafontaine, 2005), the determinants of large companies' choice to develop a franchise network are essentially linked to their type of activity. There is no evidence

of a direct link with employers' discriminatory behavior.

Our results suggests that acting on the organization of recruitment in large companies can be considered a relatively effective tool in the fight against discrimination in recruitment, at least as far as the first stage of recruitment is concerned. In both cases, there remains a gap between the callback rates for the two types of applications : Centralized HR departments lead to a decrease in the probability that "French" applicants will be preferred.

The study is organized as follows. Section 2 presents the correspondence study and its results depending on the organization of recruitment. Section 3 discusses the influence of the organization of the recruitment process on the degree of discrimination. Section 4 concludes.

2 Discrimination by HR organization

In this section, we first present the features of the experiment conducted by the French Ministry of Labor. Then we exploit data collected to identify hiring discrimination and show the results by HR organization.

2.1 Experiment

The experiment behind the data used in this article has several specific features. Unlike most experiments in which each company is generally tested only once, this experiment comprised responding, for 4 months, to several dozen offers per company. The ambition was to meet the Ministry of Labor's objective, namely, to carry out a sufficient number of tests to obtain exploitable results for each company. The data have a particularity such that they concern only large companies (more than 1,000 employees), which were all subsequently met by the Ministry of Labor after the experiment. This dialogue made it possible to collect, or possibly confirm, a certain amount of information on the organization of recruitment of each company and to know that the experiment was not detected. In particular, for each application, we know whether recruitment was carried out solely at the level of the establishment concerned or through a centralized HR department of the company.² Studying hiring discrimination in large companies is relatively original and

²We consider HR department of the company or "entity" - subsidiary, brand, company, etc. - centralized at national, regional, etc. level. However, in 3% of the cases, the selection of applications was made by an external service provider. Insofar as, as for centralized HR departments, these are

results in new research questions. In particular, these companies generally have professional HR functions, independent of other departments, which may affect the degree of discrimination. According to our review of the literature, no other correspondence studies have analyzed the impact of the recruitment organization on discrimination.

Appendix A provides details on the experiment. Overall, we retain 1,433 tests among the 1,500 tests covering 40 companies and 1,208 establishments. Responses are considered positive when the recruiter has expressed an interest (by telephone or e-mail) by offering a telephone or face-to-face interview or more rarely, by indicating that he/she wishes further details on the application received. Responses are considered rejections when a message has been received that indicates the application has not been accepted and/or that the offer has already been filled. Finally, for some applications, no reply was received³.

2.2 Level of discrimination differs by HR organization

Selections made through a centralized HR department concern slightly less than two-thirds of the tests (Table 1). Moreover, they are non-existent for six of the 40 companies in our sample, whereas they are systematic for 18 of them, particularly in the banking/insurance sector. In 16 companies, the organization of recruitment varies across establishments and offers.

The share of tests for which selection via a centralized HR department is involved is identical for female and male pairs (Table 2). Moreover, significant variations are observed depending on the level of education of the applicants and the characteristics of the position. Recruitment made through a centralized HR department more often concern positions involving management functions and permanent positions. Significant variations are also observed depending on the occupation. Within each sector, applications for the most senior positions in the hierarchy generally involve a more centralized HR department. Moreover, and notably, the bank/insurance sector is strongly marked by the centralization of recruitment, because few ap-

professional HR departments external to the establishment concerned by the offer and insofar as the case is infrequent, we associate this method of selecting applications with selections made by a centralized HR department. For simplicity, we then refer only to the notion of centralized HR departments.

³Automatically generated acknowledgements of receipt are not considered responses, except for those indicating that "the application will be considered rejected if no response is made before X weeks."

Table 1: Share of tests for which a centralized HR department is involved per company

Company	# of establishments	# of tests	Centralized HR Share (%)
AA	37	39	0.0
AB	24	30	70.0
AC	26	29	100.0
AD	28	38	0.0
AE	33	38	100.0
AF	34	34	100.0
AG	37	40	50.0
AH	33	39	100.0
AI	38	39	100.0
AJ	35	39	100.0
AK	38	38	100.0
AL	29	35	100.0
AM	36	40	37.5
AN	26	29	100.0
AO	30	36	0.0
AP	34	40	100.0
AQ	23	34	44.1
AR	37	40	60.0
AS	27	30	100.0
AT	22	38	47.4
AU	31	38	47.4
AV	35	40	22.5
AW	29	30	50.0
AX	28	39	2.6
AY	15	30	100.0
AZ	19	29	69.0
BA	30	34	100.0
BB	15	30	53.3
BC	34	40	0.0
BD	32	38	47.4
BE	32	39	0.0
BF	21	26	65.4
BG	31	40	100.0
BH	30	38	100.0
BI	35	38	100.0
BJ	24	28	46.4
BK	29	33	100.0
BL	37	38	100.0
BM	38	40	0.0
BN	36	40	7.5
Total	1,208	1,433	61.7

Scope: panel of 40 companies of 1000 employees or more; France.

Source: ISM CORUM-Dares.

plications are selected at the establishment level. Finally, offers from companies showing their commitment to diversity are more often those for which a centralized HR department is involved. This result suggests that the centralization of the HR function is not neutral from a discrimination perspective.

Table 3 provides the raw results. Where the selection is managed solely within the establishment, the success rate decreased to 25.5% for "North African" applications and remains relatively high for "French" applications (41.3%). When a centralized HR department is involved, "North African" applications are selected in 43.8% of cases compared with 50.6% of the "French" applications.

It shows that hires made solely at the establishment level generate a higher level of discrimination than hires involving a centralized HR department. The difference in the positive response rate between "North African" and "French" applications is 15.8 points for recruitment made only at establishment level compared with 6.8 points when a centralized HR department is involved.⁴

We can split the share of positive responses between favoritism for one origin versus another (either the "French" application has been favored compared to the "North African" application or the other way around) and equality of treatment (both applications have been either accepted or rejected). Overall, it shows that favoritism towards French applicants is much higher than towards "North African" applicants. When we distinguish by organization of recruitment, we observe that favoritism towards North African applicants remains the same whatever the type of HR organization (3.6% versus 4%), whereas it decreases dramatically for French applicants when the HR organization is centralized. It is due to the fact that both types of applicants receive more often positive responses in this case (39.8% vs 21.9%).

Therefore, it means that the organization of recruitment affects the level of discrimination. We can identify several reasons :

- (i) Members of HR departments are more aware of discrimination and its prevention, unlike managers in charge of recruitment within the establishment. An increasing number of companies have become more involved in order to comply with the legislation in the fight against discrimination in recruitment. The company's HR departments are probably more systematically involved than others in these actions. In addition to drawing up charters or pacts

⁴The observed gaps remain after controlling for observable characteristics (See 8 in Appendix). Differences in characteristics of job offers and applications are therefore not sufficient to explain the observed difference.

Table 2: Share of tests for which selection is involved via a centralized HR department

	Centralized HR	
	%	# of tests
All tests	61.7	1,433
By sex		
Women	61.7	718
Men	61.7	715
Diploma		
Vocational training	45.6	228
Bachelor	51.0	300
Bachelor + 2 years	57.3	623
Bachelor + 3 years	71.0	131
Bachelor + 4 years	77.3	22
Bachelor + 5 years	93.0	129
Experience		
3 years	56.5	23
4 years	70.7	232
5 years	57.5	372
6 years	50.8	195
9 years	65.4	390
10 years	54.0	126
11 years	69.2	78
12 years	100.0	17
Management position	71.8	699
Labor contract		
Permanent	64.1	1,122
Fixed-term	50.4	260
Unknown	66.7	51
Occupations		
Sales and technical sales managers	86.4	103
Retail store operators and intermediaries	59.6	198
Self-service employees	48.3	58
Sellers	34.8	259
Banking and insurance managers	100.0	94
Banking and insurance employees	98.7	80
Banking and insurance technicians	93.4	121
Hotel, cafe and restaurant managers	74.7	91
Hotel and catering employees and operators	30.4	181
Cooks	60.5	248
Company involved in diversity	71.1	757

Reading: Out of 1433 tests carried out, 61.7% of the pairs of applications are selected by a centralized HR department within the company.

Scope: panel of 40 companies of 1,000 employees or more; France.

Source: ISM Corum-Dares.

Table 3: Success rate and preferences for "French" and "North African" applications

	% Positive responses		% Preferences		Equality of Treatment	# of tests
	"French"	"North African"	"French"	"North African"		
All tests	47.0	36.8	14.1	3.8	32.9	1433
Tests by recruitment organization						
At the est. level	41.3	25.5	19.5	3.6	21.9	549
Centralized HR	50.6	43.8	10.7	4.0	39.8	884

Reading: Applications of French origin interested recruiters, exclusively or not, in 47.0% of cases against 36.8% for "North African" applications.

Scope: panel of 40 companies of 1,000 employees or more; France.

Source: ISM Corum-Dares.

for equal treatment, these may include the dissemination of guides aimed at overturning stereotypes, the financing of requested tests aimed at evaluating and rethinking recruitment practices, the creation of tools for tracking recruitment processes (to provide recruiters with greater incentives to motivate their choices), or the implementation of training campaigns on non-discrimination. Large companies are more concerned about non-discrimination training, insofar as the "Equality and Citizenship" law obliges, since January 2017, all personnel in charge of recruitment in large companies to receive training in non-discrimination at least every 5 years.

- (ii) The second reason is that HR departments have more time dedicated to HR tasks and therefore to recruitment, unlike operational staff whose primary function is not recruitment. Giving more time to the selection of applicants reduces the risk that choices are based on automatism or stereotypes (Chugh, 2004; Bartoš et al., 2016).
- (iii) Finally, professional HR departments are probably less subject to field constraints than managers in charge of recruitment. For example, managers are more tempted to adapt to consumer preferences than HR professionals (Combes et al., 2016), or to seek to maintain a certain homogeneity of teams to facilitate their management.⁵ Thus, some of these constraints can generate

⁵More diverse teams may be more difficult to manage, particularly because of the preferences of current employees (Becker, 1957), which may have an effect on productivity (Hamilton et al., 2004), while Kurtulus (2011) shows that the impact of origin or gender does not raise any issues within

discriminatory behavior.

2.3 Endogeneity Issue

The implication of a centralized HR department potentially contains an endogeneity issue. A cost-benefit trade-off is inherent in the choice of using a centralized HR department: Centralizing recruitment can, through standardization, reduce costs, but decentralizing recruitment within each establishment can increase responsiveness (less administrative intermediaries) and adaptation to the local context. Unobservables can influence the probability that the selection is managed by a centralized HR department and the existence of discrimination. Based on company monographs, the qualitative work of [Fondeur \(2013, 2014\)](#) shows that the centralization of HR departments is generally linked in part to a strategy of better control of recruitment combined with the ambition of protecting oneself from the risks of discrimination. This phenomenon can bias the analysis in either direction.

On the one hand, companies with a proactive anti-discrimination culture (which cannot be observed in our data) could be less likely to discriminate and more likely to rely on a centralized HR department. The negative correlation observed between using a centralized HR department and the level of discrimination would then partly reflect this unobservable element. Thus, the impact of the involvement of centralized HR departments on discrimination would lead to an overestimation. On the other hand, companies would favor the use of a centralized HR department for job offers most at risk in terms of discrimination (e.g., if strong pressure is linked to consumer preferences or to maintain teams of homogeneous workers to not disrupt management). Such a bias in the "use of a centralized HR department" treatment would lead to an underestimation of the impact of the involvement of centralized HR departments on the degree of discrimination. However, measuring this impact is not straightforward and requires the implementation of an appropriate econometric strategy.

3 Impact of HR organization on hiring discrimination

We propose an evaluation of the causal link between the implication of a centralized HR department and the probability that the "French" application will be favored

companies.

based on the use of an instrumental strategy and a recursive bivariate probit model (cf. [Maddala \(1983\)](#) and [Wooldridge \(2010\)](#)).

3.1 Instrumental strategy

We need an instrumental variable that is correlated with the HR organization but not linked to hiring discrimination. To achieve this goal, we propose two different instrumental variables that are not correlated with a discriminatory behavior: (i) the company is a franchisor and (ii) the establishment is a franchisee. The second one is more precise but we do not have this status for all establishments and consequently lose some observations.

The franchisors that have developed a franchise network consent to establishments using their brand and give support and expertise to franchisees in exchange for a fee.⁶ However all establishments of a franchisor are not necessarily franchisees even if they generally operate with some autonomy. By developing a franchise network, franchisors acquire a better knowledge of the advantages due to the autonomy of their establishments (e.g., better adaptation to the local context, greater responsiveness, and shorter recruitment times). Thus, it is possible that companies that have developed franchisees entrust both franchisees and non-franchisees establishments with more tasks, including in terms of recruitment. Our results clearly indicate that the use of a centralized HR department is less frequent (a 0.37 point less probability) when the establishment concerned by the offer belongs to a franchising company.

Concerning franchisees, they have by definition a certain independence, primarily financial. But it also likely concerns other aspects of company management, including recruitment. Even if certain agreements with the franchisor impose a right of supervision in the recruitment ([Truss, 2004](#)), franchisees more frequently control their hiring than non-franchise establishments.

Furthermore, our two instrumental variables (i) the company is a franchisor and (ii) the establishment is a franchisee do not affect the likelihood that the employer will adopt a discriminatory attitude. According to the literature on discrimination, employers' discriminatory behavior may be driven by three different motives. First, it could be the unconscious prejudices of employers (see [Bertrand et al. \(2005\)](#) and [Rooth \(2007\)](#)). Discriminatory behavior can also be linked to recruiters' beliefs about the productivity of certain demographic groups (statistical discrimination;

⁶See Appendix B for more details on franchises.

see Phelps (1972)). Finally, discrimination may also result from the preferences of employers, employees or consumers (Becker (1957); Combes et al. (2016) for consumer preferences). To our knowledge, there is no direct link between being a franchisor or a franchisee and discriminatory behavior.

According to the literature on franchising, there is no link between franchisors and discrimination. Being a franchisor is essentially linked to commercial purposes and the type of activity (see Appendix B). Blair and Lafontaine (2005) suggest, in particular, that large companies have an overall economic and financial interest in developing a franchise network. Above all, however, if not all of companies (approximately one third of the companies in our sample) do so, it is essentially because their main activity does not allow it. As the authors indicate, two essential conditions must be fulfilled. First, products must be made relatively uniform between establishments. Second, the risks and costs associated with a possible deterioration of the brand image by a franchisee must be limited, which is again essentially due to the nature of the production. Nevertheless, if certain activities are more confronted with the question of consumer preference towards the company's employees, franchising and the level of discrimination are both linked to the type of activity. However being a franchisor and occupations in contact with the public are not correlated, the coefficient of correlation is 0.03. Moreover, we control for occupations in our estimates. Consequently, the determinants of franchising are not linked to the existence of discriminatory behavior from recruiters.

Regarding the case where the employer is a franchisee, the literature shows that their main characteristics are their desire for financial independence and their expectations in terms of the franchisor's support and experience in order to ensure the smooth running of the business (Appendix B). Thus, in some cases, hiring is likely to be highly supervised by the franchisor (Truss, 2004) and in other cases, franchisors grant a certain autonomy to their franchisees to ensure franchisees are free to adapt to the context in which they work (Brander and Croonen, 2010). There is therefore a priori no reason why the recruitment practices of franchises should be more or less discriminatory than those of other employers, because the determinants of discrimination are of a completely different nature. A possible argument could be that franchisees are partly independent; thus, franchisees are better able to express preferences for types of applicants or stereotypes or beliefs leading to discriminatory recruitment. Two counterarguments must be mentioned. Franchisees are not totally independent entrepreneurs but independent "under control" (Feldstead, 1993b). Entrepreneurs who want complete autonomy would probably

not have chosen to open a franchise. Moreover, another possibility is that recruiters in non-franchised institutions also express, to some extent, preferences, stereotypes or beliefs. The results in Table 4 confirm our intuitions as, when we separate the type of recruitment, there is no direct effect of franchise on hiring discrimination; thus, there merely might be an indirect effect through the organization of recruitment (franchisees more often recruit at the establishment level).⁷

Table 4: Probability that the French application is favored for each type of recruitment organization and according to the existence or not of a franchise network (probit model)

	Centralized HR		Selection at the establishment level	
Franchisees network	0.01 (0.02)	0.02 (0.02)	0.04 (0.08)	0.03 (0.08)
Controls	No	Yes	No	Yes
# of obs	1,768	1,768	1,098	1,098

Reading: the difference between the application rates of "French" and "North African" origin that interested recruiters increases by 0.04 pp. when there is a franchise network and in the case where the selection of applications is made only within the establishment; but this difference is not significant. Standard errors are in brackets. Asterisks indicate statistically significant deviations at thresholds of 1% ***, 5% ** and 10% *.

Scope: panel of 40 companies of 1000 employees or more; France.

Source: ISM Corum-Dares.

Differentiating establishments according to whether they belong to a franchisor allows us to separate establishments that have a high probability of operating relatively independently from the other establishments in terms of recruitment. We estimate the following bivariate recursive probit model:

$$Pos_french_{ij} = \mathbb{1}[\delta HR_{ij} + \gamma X_{ij} + \mu_{ij} > 0] \quad (1)$$

where Pos_french_{ij} is a variable equals to 1, for application pair i , if the applicant of "French" origin has interested the recruiter of company j and 0 otherwise; X_{ij} is a vector of characteristics of application pair i and company j , whose content

⁷As above, franchisees activities and occupations in contact with the public are not correlated, the coefficient of correlation is 0.05.

varies according to the specifications adopted; μ_{ij} is the error term, clustered by company; and HR_{ij} is a dummy indicating the level of recruitment, centralized or not, that the applicant in pair i faces when applying for a post in company j , this variable is endogenous and estimated from the probit model.

$$HR_{ij} = \mathbb{1}[\zeta Franchise_{ij} + \phi\chi_{ij} + v_{ij} > 0] \quad (2)$$

where $Franchise_{ij}$ is an indicator of the existence (or not) of a franchise network in company j (our instrumental variable), and v_{ij} is the error term. The vector X_{ij} and χ_{ij} include all variables available on the applicants and companies tested. We also include "region" fixed effects to control for local economic context. However, we do not include a "company" fixed effect. Because some companies use a centralized HR department for all their recruitments (Table 1), the concomitant introduction of the recruitment organization type indicator and a "company" fixed effect would involve collinearity and would be likely to disrupt evaluation. To improve the evaluation of the interest of considering an instrument on measuring the impact of using a centralized HR department, we compare the results of the recursive bivariate probit model (Equations 1 and 2) with those of a simple probit model including the variable "use of a centralized HR department".

3.2 Results

The empirical results are summarized in Table 5. Columns (1) and (2) report the estimates of the recursive bivariate probit using (i) the company is a franchisor, (ii) the establishment is a franchisee as instrumental variables, respectively. Column (3) shows the result of the simple probit model. All controls are available in Tables 10 and 11 in Appendix.

The results indicate that the impact of involving a centralized HR department is higher when we instrument. This result shows that when we correct for endogeneity (Columns (1) and (2)), the probability that the "French" applicant is favored is by roughly 0.30 points less when the selection involves a centralized HR department, whereas it is 0.10 points lower in the case of a naive estimate (Column (3)).⁸ The significance of the negative correlation between the unexplained elements of our two variables of interest (cf. the terms atrho and ρ) also confirms the valid-

⁸Table 12 in Appendix shows that HR organization has no impact on favoritism for "North African" applicants, as suggested by descriptive statistics in Table 3.

ity of our estimation strategy for the main instrument but also for the alternative one. Unobservable characteristics simultaneously influence the probability that the recruiter has a discriminatory attitude and that a centralized HR department is involved in recruitment. In other words, the companies for which a centralized HR department is involved are places in which the discriminatory risk is the greatest and for which the effect of using the centralized HR department is lower (leading to an underestimation of the effect by means of an uncorrected estimate). Our econometric strategy allows us to correct this bias.

This result is also confirmed by the estimations on subsamples (Appendix, Table 13 by gender; Table 14 without the banking/insurance sector, where applications are mostly selected by a centralized HR department). The effect of the organization of recruitment on discrimination is therefore a priori relatively homogeneous, except for the occupations. In particular, considering the organization of recruitment reduces the level of discrimination compared with the reference group for the retail and hotel and catering sectors, and it tends to increase for the banking and insurance sectors, for which the centralization of the HR function is higher (Table 2). These observations indicate a downward effect of the centralization of recruitment on the level of discrimination.

4 Conclusion

Based on a correspondence study, our results show a significant risk of hiring discrimination for workers with a North African origin in large companies in France. The results confirm the raw results observed by [Foroni et al. \(2016\)](#), even when we control for observable characteristics. One of the original features of this result is that the discriminatory risk is lower than the one detected by most of the experiments conducted in France on the same origins. Unlike other experiments, this study concerns only large companies in different sectors. We show that the use of centralized HR departments in the recruitment of applicants, instead of recruitments made only within the establishment (often by operational staff and not HR professional) plays an important role in the degree of discrimination for "North-African" applicants: the process results in around 0.3 point decrease in the probability that "North African" applicants are discriminated against compared with "French" applicants.

This result suggests that acting on the organization of recruitment in large com-

Table 5: Likelihood that the "French" application will be favored

	(1) Recursive probit		(2) Recursive probit		(3) Probit
	"French" favored	Centralized HR dep. IV 1	"French" favored	Centralized HR dep. IV 2	"French" favored
Centralized HR department	-0.29*** (0.09)		-0.32*** (0.09)		-0.10*** (0.02)
The company is a franchisor		-0.36*** (0.10)			
The establishment is a franchisee				-0.21*** (0.02)	
Occupations					
Retail store operators and intermediaries	-0.02 (0.05)	-0.22** (0.10)	-0.05 (0.06)	-0.27*** (0.05)	0.01 (0.04)
Self-service employees	-0.12* (0.06)	-0.23 (0.15)	-0.17** (0.08)	-0.48*** (0.09)	-0.08* (0.04)
Sellers (retail)	-0.06 (0.06)	-0.37*** (0.12)	-0.12 (0.08)	-0.66*** (0.05)	0.01 (0.05)
Banking and insurance managers	0.03 (0.09)	0.14 (0.09)	0.03 (0.09)	0.04* (0.02)	0.02 (0.07)
Banking and insurance employees	0.22*** (0.08)	0.10 (0.11)	0.18** (0.09)	0.03 (0.03)	0.18** (0.08)
Banking and insurance technicians	0.08 (0.06)	-0.19 (0.20)	0.07 (0.08)	-0.07* (0.04)	0.05 (0.05)
Hotel, cafe and restaurant managers	0.04 (0.06)	-0.11 (0.12)	0.01 (0.07)	-0.23*** (0.05)	0.04 (0.05)
Hotel/catering employees and operators	-0.06 (0.06)	-0.38*** (0.14)	-0.12 (0.08)	-0.73*** (0.05)	0.01 (0.05)
Cooks	-0.05 (0.06)	-0.25* (0.14)	-0.12 (0.07)	-0.43*** (0.05)	-0.02 (0.04)
Pseudo R^2					0.06
atrho	0.64 (p-value=0.04)		0.79 (p-value=0.03)		
rho		0.57		0.66	
LR test of $\rho = 0$	$Prob > \chi^2 = 0.04$		$Prob > \chi^2 = 0.03$		
Log pseudolikelihood	-1194.225		-903.319		-549.575
# of obs	1,433		1,160		1,433

Note: This estimation is controlled for age, age squared, sex, diploma, labor contract, management position, experience, diversity label, order of application, regions. Asterisks indicate statistically significant differences at the 1% ***, 5% ** and 10% * thresholds.

Reading: The probability that the "French" application is favored decreases by 29 pp. when a centralized HR department is involved (column (1)).

Scope: panel of 40 companies of 1000 employees or more; France.

Source: ISM Corum-Dares.

panies can be considered an effective tool in the fight against discrimination in recruitment, at least for the first stage of recruitment, i.e. before interviews. The professionalization of the recruitment position is therefore a potential solution in the fight against discrimination in recruitment, and this aspect, according to our review of the literature, has never been highlighted by a study of this type.

Notably, further exploration of the mechanisms at work is crucial. Indeed, we do not know to what extent this effect is linked to the following: (i) HR professionals are better trained and more aware of discrimination than managers, (ii) HR professionals are further away from field issues (considering customer preferences or team management issues can generate discriminatory hiring behavior to which managers are probably more sensitive), or (iii) HR professionals have more time they can dedicate to recruitment, which allows them to make their selection more on the basis of assessing applicants' skills and less on the basis of stereotypes.

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A Data Collection and design

A.1 Selection of firms and occupations

The selected companies are multi-establishment companies or franchise networks with more than 1,000 employees in the trade, bank/insurance, and hotel/catering sectors. The sectors have been chosen to ensure they include several large companies with a significant number of vacant positions for a small number of occupations. The companies targeted during the design of the experiment that did not publish a sufficient number of offers were excluded from the experiment. Finally, only companies with several dozen offers published on their website in March 2016, for ten relatively common occupations, were selected. This sample comprises 40 companies: 30 were tested 40 times and 10 were tested 30 times (Table 6). Applications were sent only in response to job offers.

Some characteristics also affected the selection of job offers. In particular, one objective of this study was that half of the offers should be managerial positions and the other half non-managerial positions. Moreover, permanent and fixed-term contracts were selected. More than three quarters of the positions provide permanent contracts, the remaining one quarter of the positions provide mainly fixed-term contracts.

To have a sufficient number of tests per company, job offers are located throughout France. In this analysis, we eliminated tests that concern job offers with an unknown location. We also exclude the invalid tests due to the withdrawal of the offer by the employer between the two applications. Overall, we retain 1,433 tests among the 1,500 tests. Table 6 shows the distribution by region. Approximately one quarter of the job offers are located in the Ile-de-France region (Paris), the Auvergne-Rhône-Alpes region is also widely represented with 13.5% of the offers. Table 6 also shows that for over half of the offers tested, the company shows on its website a commitment to diversity, equal treatment and/or the fight against discriminatory risks linked to the criterion of origin. This indicator does not take into account mentions concerning other criteria (e.g., disability, professional equality between women and men).

Table 6: Descriptive statistics concerning the tested job offers

	%	# tests
Occupation		
Sales and technical sales managers	7.2	103
Retail Store Operators and Intermediaries ^[1]	13.8	198
Self-Service Employees	4	58
Sellers	18	259
Banking and insurance managers ^[2]	6.6	94
Banking and insurance employees	5.8	80
Banking and insurance technicians	8.4	121
Hotel, cafe and restaurant managers	6.3	91
Hotel and catering employees and operators	12.6	181
Cooks	17.3	248
Region		
Auvergne-Rhône-Alpes	13.5	193
Bourgogne-Franche-Comte	4.4	63
Bretagne	4	57
Centre-Val de Loire	4.1	60
Grand Est	8	115
Hauts-de-France	5.7	82
Ile-de-France	24.3	348
Normandie	5.1	73
Nouvelle-Aquitaine	8.2	117
Occitanie	7.2	103
Pays de la Loire	5.9	85
PACA	9.6	137
Management position	48.8	699
Labor contract		
CDI (permanent)	78.3	1,122
CDD (fixed-term)	18.1	360
Unknown	3.6	51
Company committed to diversity	52.8	757
Sample	100	1,433

[1] Department managers, sales consultants, customer managers, shop managers.

[2] Agency managers, customer advisors.

Scope: panel of 40 companies of 1,000 employees or more; France.

Source: ISM Corum-Dares.

A.2 Profiles of fictitious applicants

Each pair of applications contains one application with a so-called "North African" sounding name and another with a so-called "French" sounding name.⁹ The other criteria are identical for each applicant in the same pair, including the indication of French nationality. Compared with the tests usually carried out, the experimentation on which we rely required the use of a relatively large number of profiles for two reasons. First, this correspondence study targets a greater number of occupations than the other studies in the literature. Consequently, we considered it was necessary to create profiles adapted to each occupation and each sector. Second, because several applications were potentially sent to the same recruiters, special attention also had to be paid to the increased risk of detection, which also explains some variations in terms of experience, age, or diploma. This limitation led to the use of 147 pairs of applications for 1,500 tests, where each pair consists of two resumes and two cover letters. For each application of the same pair, permutations were made from one test to another between the "North African" and "French" origins in order to avoid possible biases linked to the quality of resumes and cover letters. Permutations were also made from one test to another to ensure the application first sent evokes either a "North African" origin, or a "French" origin. Of the 1,433 tests selected for this study, resumes are almost equally distributed by gender (Table 7). Moreover, the age of the applicants is between 20 and 36 years, their level of diploma is from lower than bachelor to graduate, and they have medium experience (4 to 6 years for a little more than half of the resumes) or confirmed experience (9 to 11 years). Finally, and notably, the residential locations of the fictitious applicants are socially neutral.

A.3 Data collection

Applications were sent between April and July 2016 with a 1-day spacing between the two applications for low-skilled job offers, which was sometimes reduced to half a day to test companies recruiting within very short deadlines; and a time limit of up to 3 working days for tests concerning the most qualified applications, or a little longer when responding to offers for which qualified applications are potentially rare. In all cases, the objective was not to risk arousing recruiters'

⁹Relatively common surnames and given names for each origin were chosen, for example Malika SAYED, Aurélie FAVRE, Malik BOUNA or Guillaume CLERC.

Table 7: Descriptive statistics concerning applicants

	%	# tests
Gender		
Women	50.1	718
Men	49.9	715
Age (min =20, max=36)	26.3	1433
Diploma		
Vocational training	15.9	228
Bachelor	20.9	300
Bachelor + 2 years	43.5	623
Bachelor + 3 years	9.1	131
Bachelor + 4 years	1.5	22
Bachelor + 5 years	9	129
Experience		
3 years	1.6	23
4 years	16.2	232
5 years	26	372
6 years	13.6	195
9 years	27.2	390
10 years	8.8	126
11 years	5.4	78
12 years	1.2	17
First sent application		
"French"	49.3	706
"North African"	50.7	727
Sample	100	1,433

Scope: panel of 40 companies of 1,000 employees or more; France.

Source: ISM Corum-Dares.

suspicious. Both applications were always sent in the same manner, using the application form proposed on the website where the offer was published or, less frequently, by e-mail. Responses were collected until August 31, 2016.

Information on the organization of recruitment was collected in two steps. First, during the elaboration of the experiment, several types of information were crossed. Information on the identity and/or function of the recruiter may have been collected from the information provided for some of the job advertisements. Where appropriate, this information has been cross-checked with information appearing on company websites regarding how recruitment is organized. The identity and/or function of the person who sent the reply message or acknowledgement was also considered. In a second stage, this information was cross-checked with that gathered during meetings with representatives of each company at the Ministry of Labour. This second stage made it possible to either validate or specify the organization of recruitment for each offer, i.e. whether an HR department external to the establishment was involved.

A.4 Estimation of success rate by origin

Results show that 50.8% of the tests received at least a positive reply from the employer. This relatively high return rate reveals the good quality of the applications and a certain tension in the job market for at least some of the occupations we are considering.

Using a bivariate probit model, we control for firm and individual characteristics:

$$Success_{ij} = \mathbb{1}[\beta French_i + \delta RH_{ij} + \gamma X_{ij} + \mu_{ij} > 0] \quad (3)$$

where $Success_{ij}$ is a variable equals to 1 if the applicant has interested the recruiter of company j and 0 otherwise; $French_i$ equals 1 if the applicant has a French sounding name; X_{ij} is a vector of characteristics of application pair i and company j , whose content varies according to the specifications adopted; μ_{ij} is the error term, clustered by company; and RH_{ij} is a dummy indicating the level of recruitment, centralized or not, that the applicant in pair i faces when applying for a post in company j , this variable is endogenous and estimated from the probit model. The estimate of β is summarized in Table 8 depending on different specification of the model.

Table 8: Differences in success rates between "French" and "North African" app. according to the type of recruitment organization (bivariate probit)

β	Differences in success rates between "French" and "North African" applications			
All tests	10.3***	10.2***	10.3***	10.2***
# obs 2,866	(1.83)	(1.07)	(1.07)	(1.06)
By recruitment organization				
At the etab. level	15.8***	15.7***	15.6***	15.4***
# obs 1,098	(2.81)	(1.85)	(1.82)	(1.82)
Centralized RH	6.8**	6.8***	6.8***	6.9***
# obs 1,768	(2.37)	(1.26)	(1.26)	(1.26)
Controls	No	Yes	Yes	Yes
Regional FE	No	No	Yes	Yes
Company FE	No	No	No	Yes

Reading: The difference between the application rates of "French" and "North African" origin that interested the recruiters is 10.3 pp. without controls and 10.2 pp. taking into account the effects of structures and fixed effects of regions and companies. The correction is based on the estimation of a probit model and, to account for the difference, the calculation of a marginal effect for the $french_i$ variable. Standard deviations are grouped by test. Variables to correct for "composition effects" include age, gender, degree level, experience and gender of the pair, type of contract, position level (managerial or non-managerial), first application sent for the test ("North African" or "French"), occupation concerned by the test and company commitment to diversity. Standard errors are in brackets. Asterisks indicate statistically significant deviations at thresholds of 1% ***, 5% ** and 10% *.

Scope: panel of 40 companies of 1,000 employees or more; France.

Source: ISM Corum-Dares.

A.5 Heteroscedastic Probit

Heckman and Siegelman (1993) suggest that the differences measured by the testing method between two identical candidates (except for the criterion tested) do not necessarily reflect discrimination linked to employers' preferences (Becker, 1957) or "classical" statistical discrimination (Phelps, 1972) linked to the attribution by employers of different levels of productivity to two candidates of the same pair. These differences may also be related to productivity being imperfectly observed by employers. Even if employers assign similar levels of productivity to two candidates in the same pair, there is no reason why the variances should be the same. Thus, there is uncertainty about the candidates' skills, which may vary in either direction, that may lead to differences in treatment of similar resumes and perceived average productivity levels between the two candidates. Some refer to this as "second-order statistical discrimination".

The heteroscedastic probit works as follows. No matter how complete the resumes, the productivity of candidates is imperfectly observed by employers and the probability of accurately evaluating the application contains a portion of unobservables from the employers' perspective. Thus, even if employers assign similar average unobservable skills to each of the two applicants in the same pair, they may assign different variances for the unobservable share of skills for the two applicants. These differences in terms of variances in the unobservable share of skills may lead recruiters to make different choices regarding the two candidates in the same pair when these are similar from the perspective of the designers of the experience and employers do not express differences in taste and think that the two types of candidates are on average equally competent. Either candidate may be favored depending on the circumstances. For example, depending on whether the candidates have high or low average skill levels, the candidate with the greatest variance in unobservable skills may be rejected or preferred.

Table 9: Differences between the "French" and "North African" application rates that interested recruiters corrected for structural effects and fixed effects for region and company (probit and heteroscedastic probit)

	All tests	Women	Men
Probit	10.2*** (1.06)	8.0*** (1.49)	12.4*** (1.49)
Heteroscedastic Probit	10.2*** (1.06)	8.1*** (1.51)	12.2*** (1.47)
<i>Wald test (p-value): there is a difference between the standard deviations of non-observables influencing the success rates of "French" and "North African" applications</i>			
Controls	Yes	Yes	Yes
Region FE	Yes	Yes	Yes
Company FE	Yes	Yes	Yes
# applications	2,866	1,436	1,430

Reading: the difference between the "French" and "North African" application rates that interested recruiters is 10.2 percentage points, taking into account the effects of structures and the fixed effects of regions and companies. The correction is based on the estimation, as appropriate, of a probit model or a heteroskedastic probit model and, to account for the difference, the calculation of a marginal effect for the *French_i* variable. Standard deviations are grouped by test. The variables used to correct for "structural effects" include the age of the pair of applications, the degree level of the pair, the experience of the pair, the type of contract, the level of the position (management or not), the first application sent for the test ("North African" or "French"), the occupation concerned by the test (except for assessments by occupation), the company's commitment to diversity and the gender of the pair of applications (except for assessments by gender). Standard errors are in brackets. Asterisks indicate statistically significant deviations at thresholds of 1% ***, 5% ** and 10% *.

Scope: panel of 40 companies of 1000 employees or more; France.

Source: ISM CORUM-Dares.

B Franchising

Franchising is a commercial relationship between a franchisee and a franchisor. But the franchise remains difficult to define because it varies considerably by country and there is no global definition of the phenomenon. In the literature, franchising has been defined as a pure sales method (Mendelsohn (2006), Srinivasan (2006)) or as a means of entrepreneurial cooperation (Shane and Hoy, 1996). Sherman (2004) presents franchising primarily as a strategic relationship between individuals, bounded by laws specific to the countries in which they operate (Hoffman and Preble, 2004). The French Franchise Federation defines franchising as a mode of collaboration between two legally and financially independent companies. The franchisor makes available the signs of customer rallying (brand and banner, architectural concept, visual identity system), the expertise of its brand and technical and commercial assistance. The franchisee must develop and maintain the brand image, improve expertise and respect the brand concept. A franchise therefore enables a self-employed person to start up more quickly by optimizing chances of success and a franchisor to base commercial development on a network of business managers involved in the local market. The relationship between a franchisor and a franchisee is broadly described as a low-cost expansion strategy for the franchisor and a means for the franchisee to run its business with logistical and strategic support from the franchisor. The management research literature has focused on the relationship between franchisee and franchisor and the benefits for each in that relationship. In particular, for the franchisor, a strategy is to replicate its business model and management system (Hoy et al., 2017). An individual's decision to become a franchisee generally stems from a desire to become independent (Feldstead (1993a), Kaufmann and Stanworth (1995), Peterson and Dant (1990)). As franchising allows individuals seeking greater autonomy and independence, with little or no prior experience (Kaufmann, 1999) or technical knowledge (Williams, 1999) to enter the market, there is an expectation on the part of franchisees that the franchisor will provide the necessary support for the business to be successful (Hoy et al., 2017). Some of the literature has studied the specificities of franchises in terms of human resources management. Castrogiovanni and Kidwell (2010) investigated at management differences between the manager of the unit being an employee of the franchisor and the owner of the unit. They show that the differences are based on entrepreneurial orientation capabilities, the application of franchise characteristics and the lesser adverse selection effects for owners. Truss

(2004) shows that, in the franchise network he studied, franchisors have a right to control hiring and human resource management, and in particular the most experienced employees.

C Additional Results

Table 10: Likelihood that the "French" application will be favored (IV1 - the company is a franchisor)

	(1) Recursive bivariate probit		(2) Probit
	"French" app favored	Centralized RH dep.	"French" app favored
Centralized HR department	-0.29*** (0.09)		-0.10*** (0.02)
Existence of a franchise network		-0.36*** (0.03)	
Age	-0.04 (0.05)	-0.02 (0.05)	-0.03 (0.05)
Age squared	0.00 (0.00)	0.00 (0.00)	0.00 (0.00)
Men	0.02 (0.02)	0.00 (0.02)	0.02 (0.02)
Diploma			
Vocational training	0.02 (0.04)	-0.03 (0.04)	0.04 (0.04)
Bachelor + 2 years	-0.04 (0.03)	-0.01 (0.04)	-0.04 (0.03)
Bachelor + 3 years	0.01 (0.04)	0.05 (0.05)	-0.01 (0.04)
Bachelor + 4 years	0.11 (0.12)	0.06 (0.11)	0.07 (0.12)
Bachelor + 5 years	0.01 (0.08)	0.10 (0.08)	-0.01 (0.08)
Experience			
3 years	-0.01 (0.11)	0.09 (0.12)	-0.00 (0.11)
4 years	-0.06 (0.06)	0.03 (0.06)	-0.06 (0.05)
5 years	-0.11** (0.05)	-0.02 (0.05)	-0.10** (0.04)
6 years	-0.05 (0.04)	-0.04 (0.04)	-0.04 (0.04)
9 years	Ref	Ref	Ref
10 years	-0.06* (0.04)	-0.06 (0.05)	-0.06 (0.04)
11 years	0.02 (0.05)	0.02 (0.05)	0.01 (0.05)

Continued on next page

	(1) Recursive bivariate probit		(2) Probit
12 years	-0.02 (0.12)	1.65*** (0.08)	-0.08 (0.11)
Occupations			
Retail store operators and intermediaries	-0.02 (0.05)	-0.22*** (0.04)	0.01 (0.04)
Self-service employees	-0.12** (0.06)	-0.23*** (0.07)	-0.08 (0.05)
Sellers	-0.06 (0.06)	-0.37*** (0.06)	0.01 (0.05)
Banking and insurance managers	0.03 (0.07)	0.14*** (0.05)	0.02 (0.08)
Banking and insurance em- ployees	0.22*** (0.08)	0.10* (0.05)	0.18* (0.08)
Banking and insurance tech- nicians	0.08 (0.07)	-0.19** (0.08)	0.05 (0.06)
Hotel, cafe and restaurant managers	0.04 (0.06)	-0.11** (0.05)	0.04 (0.06)
Hotel/catering employees and operators	-0.06 (0.06)	-0.38*** (0.05)	0.01 (0.05)
Cooks	-0.05 (0.05)	-0.25*** (0.05)	-0.02 (0.05)
Management position	0.00 (0.03)	0.04 (0.04)	-0.00 (0.03)
Labor contract			
Permanent	0.03 (0.02)	0.03 (0.03)	0.01 (0.02)
Unknown	0.04 (0.06)	0.08 (0.06)	0.02 (0.05)
First sent application "North African"	0.04** (0.02)	0.01 (0.02)	0.03* (0.02)
Region			
Bourgogne-Franche-Comte	0.05 (0.06)	0.00 (0.06)	0.05 (0.05)
Bretagne	-0.01 (0.05)	-0.00 (0.06)	-0.01 (0.05)
Centre-Val de Loire	0.01 (0.05)	-0.03 (0.06)	0.01 (0.05)
Grand Est	-0.01 (0.04)	-0.08* (0.04)	0.01 (0.04)
Hauts-de-France	0.05 (0.05)	0.08 (0.05)	0.04 (0.05)

Continued on next page

	(1) Recursive bivariate probit		(2) Probit
Ile-de-France	0.01 (0.03)	0.02 (0.03)	0.01 (0.03)
Normandie	-0.01 (0.05)	-0.07 (0.06)	0.01 (0.05)
Nouvelle-Aquitaine	-0.06* (0.04)	-0.10** (0.05)	-0.04 (0.03)
Occitanie	0.03 (0.04)	-0.03 (0.05)	0.03 (0.04)
Pays de la Loire	0.02 (0.05)	-0.09* (0.05)	0.04 (0.04)
PACA	0.01 (0.04)	-0.04 (0.04)	0.02 (0.04)
Company involved in diversity	0.05** (0.02)	0.03 (0.02)	0.03* (0.02)
Pseudo R2		0.06	
atrho	0.64 (p-value=0,05)		
rho	0.57		
LR test of $\rho = 0$	$Prob > \chi^2 = 0.05$		
Log pseudolikelihood	-1194,225		-549,575
# of tests	1,433		1,433

Reading: The probability that the "French" application is favored decreases by 29 pp. when a centralized HR department is involved (column (1)). Asterisks indicate statistically significant differences at the 1% ***, 5% ** and 10% * thresholds.

Scope: panel of 40 companies of 1000 employees or more; France.

Source: ISM Corum-Dares.

Table 11: Likelihood that the "French" application will be favored (IV2 - the establishment is a franchisee)

	(1) Recursive bivariate probit		(2) Probit
	"French" app favored	Centralized RH dep.	"French" app favored
Centralized HR department	-0.32*** (0.09)		-0.09*** (0.02)
The establishment is a franchise		-0.21*** (0.02)	

Continued on next page

	(1) Recursive bivariate probit		(2) Probit
Age	-0.04 (0.06)	-0.03 (0.06)	-0.03 (0.06)
Age squared	0.00 (0.00)	0.00 (0.00)	0.00 (0.00)
Men	0.02 (0.02)	-0.02 (0.02)	0.02 (0.02)
Diploma			
Vocational training	-0.02 (0.04)	-0.01 (0.04)	-0.01 (0.04)
Bachelor + 2 years	-0.06 (0.04)	-0.03 (0.04)	-0.05 (0.04)
Bachelor + 3 years	-0.02 (0.05)	0.04 (0.05)	-0.01 (0.05)
Bachelor + 4 years	0.19 (0.17)	0.15 (0.11)	0.14 (0.18)
Bachelor + 5 years	-0.02 (0.09)	-0.02 (0.08)	-0.02 (0.09)
Experience			
3 years	-0.06 (0.12)	-0.00 (0.13)	-0.06 (0.12)
4 years	-0.07 (0.06)	0.04 (0.06)	-0.08 (0.05)
5 years	-0.10** (0.05)	-0.02 (0.05)	-0.09** (0.05)
6 years	-0.05 (0.04)	-0.08* (0.04)	-0.03 (0.04)
9 years	Ref	Ref	Ref
10 years	-0.04* (0.04)	-0.01 (0.05)	-0.04 (0.04)
11 years	0.03 (0.06)	0.09 (0.06)	0.01 (0.06)
12 years	0.11 (0.13)	1.44*** (0.08)	-0.03 (0.12)
Occupations			
Retail store operators and intermediaries	-0.05 (0.06)	-0.27*** (0.05)	0.00 (0.05)
Self-service employees	-0.17** (0.08)	-0.48*** (0.09)	-0.08 (0.06)
Sellers	-0.12 (0.08)	-0.66*** (0.05)	0.00 (0.07)
Banking and insurance managers	0.03 (0.09)	0.04* (0.02)	0.03 (0.07)
Banking and insurance em- ployees	0.18** (0.09)	0.03 (0.03)	0.18** (0.09)

Continued on next page

	(1) Recursive bivariate probit		(2) Probit
Banking and insurance technicians	0.07 (0.08)	-0.07* (0.04)	0.06 (0.07)
Hotel, cafe and restaurant managers	0.01 (0.07)	-0.23*** (0.05)	0.03 (0.07)
Hotel/catering employees and operators	-0.12 (0.08)	-0.73*** (0.05)	0.02 (0.06)
Cooks	-0.12* (0.07)	-0.43*** (0.05)	-0.05 (0.06)
Management position	-0.03 (0.04)	-0.02 (0.04)	-0.01 (0.04)
Labor contract			
Permanent	0.02 (0.03)	0.02 (0.03)	0.02 (0.03)
Unknown	0.04 (0.06)	-0.01 (0.07)	0.03 (0.06)
First sent application "North African"	0.04* (0.02)	0.00 (0.02)	0.04* (0.02)
Region			
Bourgogne-Franche-Comte	0.02 (0.06)	0.01 (0.06)	0.03 (0.06)
Bretagne	-0.02 (0.05)	-0.03 (0.06)	-0.00 (0.05)
Centre-Val de Loire	0.02 (0.06)	-0.05 (0.05)	0.03 (0.06)
Grand Est	-0.04 (0.04)	-0.06* (0.05)	0.02 (0.04)
Hauts-de-France	0.03 (0.05)	0.05 (0.05)	0.02 (0.05)
Ile-de-France	-0.02 (0.04)	-0.06 (0.03)	-0.01 (0.03)
Normandie	-0.01 (0.05)	-0.10 (0.06)	0.01 (0.05)
Nouvelle-Aquitaine	-0.09** (0.04)	-0.09** (0.05)	-0.07* (0.04)
Occitanie	-0.03 (0.05)	-0.13** (0.05)	-0.01 (0.04)
Pays de la Loire	0.01 (0.05)	-0.12** (0.05)	0.04 (0.05)
PACA	0.01 (0.05)	-0.09** (0.04)	0.02 (0.05)
Company involved in diversity	0.03 (0.02)	0.01 (0.02)	0.02 (0.02)

Continued on next page

	(1) Recursive bivariate probit	(2) Probit
Pseudo R2	0.06	
atrho	0.79 (p-value=0.03)	
rho	0.66	
LR test of $\rho = 0$	$Prob > \chi^2 = 0.03$	
Log pseudolikelihood	-903.319	-438.429
# of tests	1,160	1,160

Reading: The probability that the "French" application is favored decreases by 32 pp. when a centralized HR department is involved (column (1)). Asterisks indicate statistically significant differences at the 1% ***, 5% ** and 10% * thresholds.

Scope: panel of 40 companies of 1000 employees or more; France.

Source: ISM Corum-Dares.

Table 12: Likelihood that the "North African" application will be favored

	(1) Recursive probit		(2) Recursive probit		(3) Probit
	"N Afr" favored	Centralized RH dep. IV 1	"N Afr" favored	Centralized RH dep. IV 2	"N Afr" favored
Centralized HR department	-0.003 (0.03)		-0.02 (0.04)		-0.01 (0.01)
The company is a franchisor		-0.36*** (0.10)			
The establishment is a franchisee				-0.21** (0.09)	
Occupations					
Retail store operators and intermediaries	-0.04 (0.03)	-0.22** (0.10)	-0.05 (0.03)	-0.26** (0.11)	-0.04* (0.02)
Self-service employees	-0.09*** (0.04)	-0.23 (0.15)	-0.11*** (0.04)	-0.48*** (0.17)	- (-)
Sellers (retail)	-0.04 (0.05)	-0.37*** (0.12)	-0.06 (0.05)	-0.68*** (0.12)	-0.003 (0.05)
Banking and insurance managers	-0.04 (0.05)	0.14 (0.09)	-0.07 (0.04)	0.004 (0.04)	-0.04 (0.04)
Banking and insurance employees	-0.005 (0.04)	0.10 (0.11)	-0.07 (0.04)	0.02 (0.05)	-0.005 (0.04)
Banking and insurance technicians	-0.01 (0.04)	-0.19 (0.20)	-0.03 (0.04)	-0.007 (0.09)	-0.02 (0.04)
Hotel, cafe and restaurant managers	-0.06* (0.04)	-0.11 (0.12)	-0.08** (0.04)	-0.23** (0.11)	-0.06* (0.03)
Hotel/catering employees and operators	-0.09** (0.04)	-0.38*** (0.14)	-0.10** (0.05)	-0.73*** (0.10)	-0.08** (0.03)
Cooks	-0.07* (0.04)	-0.25* (0.14)	-0.06* (0.04)	-0.10*** (0.11)	-0.42*** (0.03)
Pseudo R^2					0.06
atrho	0.14 (p-value=0.05)		-0.01 (p-value=0.98)		
rho	0.14		-0.01		
# of obs	1,433		1,160		1,300

Note: This estimation is controlled for age, age squared, sex, diploma, labor contract, management position, experience, diversity label, order of application, regions. Asterisks indicate statistically significant differences at the 1% ***, 5% ** and 10% * thresholds. In column (3), 133 observations are dropped (there are only 1,300 observations) because there is no variation in terms of individual characteristics for these observations.

Reading: The probability that the "French" application is favored decreases by 29 pp. when a centralized HR department is involved (column (1)).

Scope: panel of 40 companies of 1000 employees or more; France.

Source: ISM Corum-Dares.

Table 13: Likelihood that the "French" application will be favored by gender (IV1)

	(1) Women		(2) Men	
	"French" app favored	Centralized RH dep.	"French" app favored	Centralized RH dep.
Use of a centralized HR department	-0.19*** (0.11)		-0.40*** (0.06)	
Existence of a franchise network		-0.35*** (0.04)		-0.35*** (0.04)
Age	-0.03 (0.06)	-0.04 (0.08)	-0.02 (0.08)	0.01 (0.07)
Age squared	0.00 (0.00)	0.00 (0.00)	0.00 (0.00)	-0.00 (0.00)
Diploma				
Vocational training	-0.03 (0.05)	-0.06 (0.06)	0.04 (0.05)	0.00 (0.05)
Bachelor	Ref	Ref	Ref	Ref
Bachelor + 2 years	0.06 (0.05)	-0.05 (0.05)	0.11** (0.05)	0.01 (0.05)
Bachelor + 3 years	0.09 (0.06)	0.10 (0.10)	-0.07 (0.06)	0.04 (0.06)
Bachelor + 4 years	0.26** (0.11)	0.05 (0.17)	-0.08 (0.15)	0.05 (0.14)
Bachelor + 5 years	0.17* (0.09)	0.03 (0.12)	-0.18* (0.11)	0.12 (0.13)
Experience				
3 years	-0.12 (0.14)	0.05 (0.17)	0.10 (0.16)	0.18 (0.18)
4 years	-0.13* (0.08)	0.05 (0.09)	0.05 (0.07)	0.07 (0.09)
5 years	-0.12 (0.06)	0.02 (0.08)	-0.10* (0.06)	-0.01 (0.07)
6 years	-0.06 (0.05)	-0.02 (0.06)	-0.05 (0.05)	-0.02 (0.06)
9 years	Ref	Ref	Ref	Ref
10 years	-0.07 (0.06)	-0.06 (0.07)	-0.07 (0.05)	-0.05 (0.06)
11 years	0.09 (0.07)	-0.02 (0.08)	-0.01 (0.07)	0.04 (0.07)
12 years	0.23 (0.15)	1.52*** (0.11)	-1.08*** (0.09)	1.57*** (0.10)
Occupations				

Continued on next page

	(1)		(2)	
	Ref	Ref	Ref	Ref
Sales and technical sales managers				
Retail store operators and intermediaries	-0.03 (0.05)	-0.27*** (0.04)	-0.03 (0.04)	-0.018*** (0.04)
Self-service employees	-0.07 (0.09)	-0.25*** (0.10)	-0.22* (0.13)	-0.30** (0.14)
Sellers	-0.03 (0.08)	-0.37*** (0.09)	-0.14 (0.09)	-0.32*** (0.08)
Banking and insurance managers	-0.01 (0.08)	1.17*** (0.11)	0.08 (0.10)	1.15*** (0.13)
Banking and insurance employees	0.18** (0.09)	1.31*** (0.11)	0.15 (0.10)	0.18 (0.14)
Banking and insurance technicians	0.06 (0.07)	-0.21** (0.11)	0.06 (0.09)	-0.18* (0.10)
Hotel, cafe and restaurant managers	-0.04 (0.07)	-0.16* (0.08)	0.10 (0.08)	-0.05 (0.08)
Hotel and catering employees and operators	-0.02 (0.08)	-0.39*** (0.08)	-0.12 (0.08)	-0.32*** (0.08)
Cooks	-0.01 (0.07)	-0.27*** (0.08)	0.11 (0.08)	-0.21*** (0.08)
Management position	-0.00 (0.04)	0.04 (0.05)	-0.00 (0.04)	0.04 (0.05)
Labor contract				
Fixed-term	Ref	Ref	Ref	Ref
Permanent	-0.01 (0.03)	0.03 (0.04)	0.05* (0.03)	0.03 (0.04)
Unknown	0.04 (0.06)	0.08 (0.06)	0.02 (0.05)	0.01 (0.05)
First sent application "North African"	0.03 (0.02)	-0.01 (0.03)	0.05* (0.02)	0.02 (0.03)
Region				
Auvergne-Rhône-Alpes	Ref	Ref	Ref	Ref
Bourgogne-Franche-Comte	0.08 (0.06)	0.01 (0.07)	-0.02 (0.07)	-0.02 (0.08)
Bretagne	-0.10 (0.09)	-0.07 (0.09)	0.04 (0.05)	0.04 (0.07)
Centre-Val de Loire	0.06	-0.04	-0.02	-0.01

Continued on next page

	(1)		(2)	
Grand Est	(0.07) 0.05	(0.07) -0.12*	(0.06) -0.06	(0.08) -0.03
Hauts-de-France	(0.06) 0.11*	(0.07) 0.04	(0.05) -0.01	(0.06) 0.14*
Ile-de-France	(0.06) 0.06	(0.07) 0.03	(0.07) -0.04	(0.08) 0.02
Normandie	(0.04) -0.05	(0.05) -0.03	(0.04) -0.03	(0.05) -0.10
Nouvelle-Aquitaine	(0.08) -0.09	(0.08) -0.07	(0.06) -0.09*	(0.08) -0.11**
Occitanie	(0.07) 0.03	(0.08) -0.03	(0.05) -0.02	(0.06) -0.04
Pays de la Loire	(0.05) 0.02	(0.07) 0.03	(0.05) -0.04	(0.06) -0.20***
PACA	(0.07) 0.03	(0.07) 0.01	(0.06) -0.02	(0.07) -0.10
Company involved in diversity	(0.05) 0.06**	(0.06) 0.06*	(0.05) 0.01	(0.06) -0.00
	(0.03)	(0.03)	(0.03)	(0.03)
atrho	0.36 (p-value=0.31)		1.25 (p-value=0.03)	
rho	0.35		0.85	
LR test of $\rho = 0$	$Prob > \chi^2 = 0.31$		$Prob > \chi^2 = 0.03$	
Log pseudolikelihood	-565.138		-588.986	
# of tests	718		715	

Reading: The probability that the "French" application is favored decreases by 29 pp. when a centralized HR department is involved (column (1)). Asterisks indicate statistically significant differences at the 1% ***, 5% ** and 10% * thresholds.

Scope: panel of 40 companies of 1000 employees or more; France.

Source: ISM CORUM-Dares.

Table 14: Likelihood that the "French" application will be favored without the Bank and insurance sector (IV 1)

	(1)
	Recursive bivariate probit "French" Centralized app favored RH dep.
Use of a centralized HR department	-0.29*** (0.09)

Continued on next page

	(1)	
Existence of a franchise network		-0.47*** (0.04)
Age	-0.02 (0.05)	-0.02 (0.07)
Age squared	0.00 (0.00)	0.00 (0.00)
Men	0.04** (0.02)	0.01 (0.03)
Diploma		
Vocational training	0.02 (0.04)	-0.01 (0.05)
Bachelor	Ref	Ref
Bachelor + 2 years	-0.03 (0.03)	-0.00 (0.05)
Bachelor + 3 years	-0.02 (0.05)	0.12** (0.06)
Bachelor + 4 years	0.17 (0.13)	0.014 (0.13)
Bachelor + 5 years	0.13 (0.10)	0.23** (0.09)
Experience		
3 years	0.02 (0.12)	0.03 (0.15)
4 years	-0.04 (0.06)	-0.00 (0.08)
5 years	-0.13** (0.05)	-0.06 (0.06)
6 years	-0.05 (0.04)	-0.07 (0.05)
9 years	Ref	Ref
10 years	-0.06 (0.04)	-0.08 (0.06)
11 years	0.03 (0.05)	0.03 (0.07)
12 years	-0.01 (0.12)	1.85*** (0.08)
Occupations		
Sales and technical sales managers	Ref	Ref
Retail store operators and intermediaries	-0.00 (0.05)	-0.27*** (0.05)
Self-service employees	-0.12** (0.07)	-0.19** (0.08)
Sellers	-0.05	-0.35***

Continued on next page

	(1)	
	(0.07)	(0.07)
Hotel, cafe and restaurant managers	0.06	-0.13**
	(0.07)	(0.06)
Hotel and catering employees and operators	-0.05	-0.39***
	(0.07)	(0.06)
Cooks	-0.05	-0.39***
	(0.07)	(0.06)
Management position	-0.01	0.11**
	(0.04)	(0.05)
Labor contract		
Fixed-term	Ref	Ref
Permanent	0.04	0.06*
	(0.03)	(0.03)
Unknown	0.10*	0.13*
	(0.06)	(0.08)
First sent application "North African"	0.04**	0.02
	(0.02)	(0.03)
Region		
Auvergne-Rhône-Alpes	Ref	Ref
Bourgogne-Franche-Comte	0.06	-0.01
	(0.07)	(0.08)
Bretagne	0.01	0.05
	(0.05)	(0.07)
Centre-Val de Loire	-0.03	-0.05
	(0.06)	(0.07)
Grand Est	-0.01	-0.09
	(0.05)	(0.06)
Hauts-de-France	0.04	0.11
	(0.06)	(0.07)
Ile-de-France	-0.01	0.03
	(0.04)	(0.04)
Normandie	-0.04	-0.08
	(0.05)	(0.07)
Nouvelle-Aquitaine	-0.08*	-0.11**
	(0.04)	(0.06)
Occitanie	-0.01	0.00
	(0.05)	(0.06)
Pays de la Loire	0.03	-0.06
	(0.05)	(0.06)
PACA	0.00	0.04*
	(0.02)	(0.03)
Company involved in diversity	0.06**	0.04*

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	(1)	
	(0.02)	(0.03)
atrho	0.60 (p-value=0,06)	
rho	0.54	
LR test of $\rho = 0$	$Prob > \chi^2 = 0.06$	
Log pseudolikelihood	-1030,554	
# of tests	1,138	

Reading: The probability that the "French" application is favored decreases by 29 pp. when a centralized HR department is involved (column (1)). Asterisks indicate statistically significant differences at the 1% ***, 5% ** and 10% * thresholds.

Scope: panel of 40 companies of 1000 employees or more; France.

Source: ISM CORUM-Dares.



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(ANR-11-LABX-0091, ANR-11-IDEX-0005-02)

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