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THE IMPACT OF GENDER ON THE FIRST PHASE OF HIRING PROCESS: FIELD EXPERIMENTS IN PORTUGAL

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THANKS

To arrive at this stage of my master graduation, I had some direct and indirect contributions.

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Ana Margarida da Conceição Lopes Duarte

THE IMPACT OF GENDER ON THE FIRST PHASE OF HIRING PROCESS: FIELD EXPERIMENTS IN PORTUGAL

By Ana Margarida Duarte

Abstract: *This paper focuses on the first phase of the hiring process and tries to understand whether there is discrimination in gender and which main determinants are behind this process. The hiring process is presently the least studied aspect in the labor relationship. This lack of awareness is due to the difficulty in gathering data on the processes that occur at the initial stage of hiring. We conducted a correspondence test, sending more than two thousand applications to randomly assigned men and women with Portuguese Master's degrees and/or foreign Master's degrees. The current study revealed clear differences between female and male applicants. Our findings provided significant evidence that, when two identical applicants are interested in the same job advertisement, the male and female applicant would receive similar replies, but the female would have higher probabilities of callbacks for an interview. This means that women are not at a disadvantage in getting offers. We find that women applicants are more likely to receive callbacks, with higher estimated probabilities in female dominated occupations when applying for management levels. Inversely, small companies discriminate more against women. Our results indicate that employers give preference to female candidates who have invested in their human capital. During this crisis period, unemployment is one of the worst features affecting the workforce. Our results indicate that employers are not "forgetting women" and women are not discriminated during the first phase of the hiring process. It is clear that gender discrimination is a reality in the labor market when viewed in long term career, but not during the admission phase.*

Resumo: *Este trabalho aborda a primeira fase do processo de selecção e recrutamento e tenta perceber se há discriminação por género, e quais são os principais determinantes por trás deste processo. O processo de selecção e recrutamento é presentemente o aspecto menos estudado da relação de trabalho. Este desconhecimento deve-se à dificuldade de recolha de dados sobre os processos que ocorrem na fase de selecção e recrutamento. Realizou-se um teste de correspondência, com mais de duas mil respostas a anúncios, feitos por mulheres e homens com mestrado concluído em Portugal e com mestrado realizado fora de Portugal. Os resultados revelam diferenças entre as mulheres e os homens candidatos. Dos quatro candidatos envolvidos num anúncio de emprego, os candidatos do sexo masculino e feminino recebem respostas semelhantes, mas as mulheres apresentam maiores probabilidades de serem chamadas para entrevista. Estes resultados mostram que as mulheres não estão em desvantagem no processo de recrutamento. As mulheres são mais propensas a receber convites para entrevistas, com maior probabilidade nas ocupações onde as mulheres estão em maioria, e para níveis executivos. Inversamente, as mulheres são mais discriminadas pelas pequenas empresas. Os resultados indicam que os empregadores dão preferência a candidatos do sexo feminino que tenham investido em capital humano. Neste período de crise, o desemprego é um dos piores atributos que atingem a força de trabalho. Os resultados indicam que os empregadores não estão a esquecer-se das mulheres, e que estas não estão a sofrer discriminação na primeira fase do processo de selecção e recrutamento. Fica claro que a discriminação entre géneros é uma realidade no mercado de trabalho, ao longo da carreira, mas não na fase de entrada.*

Palavras Chave: teste por correspondência, discriminação, selecção e recrutamento, experiência de campo, género.

Classificação JEL: C93, J16, J71, J78

1. INTRODUCTION

There are many sources of the gender gap in the labor market caused by potential discrimination by employers: concerning the salary earned for the same job, the hiring process, the occupation itself, receiving a promotion and how payment for different types of work is set. With an extensive labor market, getting access to good jobs in good companies may have a considerable impact on subsequent career developments and employment outcomes (Doeringer and Piore, 1971; Petersen and Togstad, 2006). As Lazear (1991) stated, hiring is the most important issue, promotion comes second and wages come third. Despite its importance, the hiring process is poorly understood and hardly studied. It is particularly difficult to gather relevant data. In terms of who gets offers, discrimination is also difficult to document. There is limited research using field data on who gets job offers and who does not (Petersen and Togstad, 2006). During the selection and recruitment stage, companies choose one of the following three hypotheses: *i)* they hire the future employee directly, therefore these candidates are sought after; *ii)* employers place advertisements in specialized or general media and; *iii)* they outsource the process to selection and recruitment companies. In the first solution, the favored candidate option is targeted and specific and one cannot infer any discrimination criteria on gender. In the two other solutions, by observing the selection of several candidates, it is possible to analyze the existence of discrimination.

The hiring process includes three different phases (Bloch, 1994): *i)* communication with the employer (advertisements in newspapers, specialized agencies or social networks); *ii)* selection of candidates (interviews, tests), and iii) presentation of salary conditions. Our research focuses on the first of these phases.

This study uses a different method to assess differential treatment against women by using an experimental technique to collect representative data on the labor market. The candidates, whose job applications were equivalent in their human capital but differed only in their gender, were sent out in response to job advertisements. Our experiment generates an analysis of gender discrimination in one particular sub-section of the labor market (in financial, accounting, insurance activities as well as administrative and support services). Specifically, we sent out over two thousand applications to companies that offer job opportunities. If only the gender is changed, such an approach provides an unbiased estimate of the degree of labor market discrimination during the hiring process. This methodology has been carried out in previous studies (Neumark, *et al.*, 1996; Riach and Rich, 1987, 2006; Weichselbaumer, D., 2004). Our contribution here is to analyze gender differences in callbacks for a large sample that allows us to compare across job types.

In what concerns the hiring process, we come to a gloomy conclusion. Most of the statements of good intentions and practices do not fly from paper to real life. If we think about the growth of subcontract recruiter companies, we easily understand that companies prefer to hire people with low company culture rather than their own employees. Besides creating high levels of uncertainty in the employee's approach and in his/her potential lack of commitment, this company's approach questions the so called social responsibility that most companies publicly declare. It seems that the labor market is reinforcing the role of the secondary market as it was early defined by Doeringer and Piore (1971) and Duarte *et al.* (2010).

This research focuses on the hiring process and tries to understand whether there is discrimination in gender and which are the main determinants in this process. As Pager

(2007) states, discrimination is likely to be most pronounced in the early stages of the employment relationship (hiring), when information about the applicant is minimal and when the odds of being detected are low. The method applied in this study is correspondence testing. Most researchers (Pager, 2007; Riach and Rich, 2002, 2006) agree that field experiments are the only way to make evidence available for hiring discrimination; but Portuguese social researchers have not performed field experiments that test for discrimination until recently. This study, to the best of our knowledge, is the first contribution to the study of gender discrimination in the Portuguese labor market using experimental data. Despite the introduction of antidiscrimination legislation, current results indicate an unbiased effect of women in the hiring odds. Our findings show that for female-dominated occupations there is a positive and significant bias in favor of women, similar to the findings of Riach and Rich (2006). Also, our findings suggest that the glass ceiling effect does not exist in the hiring and recruitment process, where women have a higher estimated probability than men of getting callbacks to manager positions. These results are in line with those of Petersen, and Togstad, (2006).

This thesis is organized as followed: Section 2 provides a brief review of the existing literature and hypothesis settings on gender discrimination during the hiring process. Section 3 describes the methodology and Section 4 presents the results. Section 5 discusses and analyses the results and the last section concludes the thesis.

2. LITERATURE REVIEW AND DEVELOPMENT HYPOTHESES

An analysis of Portuguese women's conditions in the labor market of 2010 and 2011 (in the 1st quarter) shows that women make up the majority of its population (51.6 per cent), although they only represent about 47 per cent of employed people (Ministério do Trabalho e da Solidariedade Social, 2010b). As in most European countries, the Portuguese labor market shows that women represent higher population, have higher human capital but for equal work earn less, failing to break the glass-ceiling. Previous research (Bagues and Esteve-Volart, 2010; Holzer, 1998; Petit, 2007) suggests that various changes on the demand side of the labor market, such as growing skill needs by employers and their shifting to other geographic locations, have greatly contributed to women's improvement. However, most research finds a consistent and permanent segregation against women (Babcock and Laschever 2003; Blau and Kahn, 2006; Melkas and Anker, 1997; Petit, 2007).

Assuming that men still enjoy an internal labor market advantage, there are two possible reasons that can partly explain the gender inequity: *(i)* men genuinely have a stronger commitment to the labor market, or employment segregation in gender is related to the labor market division in distinct sectors/segments and the existence of minority groups of workers into sectors/segments with the worst job conditions; *(ii)* the labor market is divided into distinct sectors/segments, some desirable and others less so; males and females are funneled into those sectors/segments according to their gender. If one accepts that, then the male-female inequality stems from men being in "primary" sectors/segments of the market and women in "secondary" ones (Duarte *et al.*, 2010). However, dual/segmented labor market theories (Doeringer and Piore, 1971) have not fully identified the causes of employment segregation in gender.

2.1. Hiring and gender

A real, concrete limitation for women to reach high-level positions is the unequal responsibility they still have for their children as well as the carrying out of household chores. Additionally, even young women still without family are potential mothers, with the correspondent negative perception on the hiring process. A large body of literature shows that the candidate gender might matter (Ayres and Siegelman, 1995; Black, 1995; Blank; 1991; Goldin and Rouse, 2000). A core explanation for labor market discrimination is based on economic agents having a taste for preference associated with certain people instead of others (Arrow, 1973; Becker, 1957; Donohue, 2007). This disfavor for women may indicate lower occupational access for them rather than for men, and suggests that women can potentially face occupational access discrimination. If employers, co-workers and/or consumers have tendencies towards discrimination and can distinguish women employees from men, the result may be discriminatory treatments. When employing women workers, biased employers feel that they must only pay the market salary, but they also have to pay a so-called "discriminatory psychic penalty" (Altonji and Blank, 1999; Becker, 1957; Bloch, 1994; Donohue, 2007). This penalty lowers the quantity demanded of the disfavored worker. And the greater the number of prejudiced employers or the stronger their preference intensity, the greater the employment gaps between the two groups of workers. Virtually, all other explanations for labor market discrimination are not based on preference. Instead, statistical discrimination (Arrow, 1973; Donohue, 2007; Melkas and Anker, 1997; Phelps, 1972), centered in asymmetric information about a worker's ability is the key basis for the existence of discrimination. In other words, employers simply guess that such individual characteristics are correlated with the unobserved performance

determinants. In examining discrimination cases during the recruitment process and candidate selection in the Austrian labor market, Weichselbaum (2004) found that women are treated unequally. However, Fernandez and Weinberg (1997), using data in entry-level positions in a large bank, find a small positive effect of being female in getting a job offer. Neumark, *et al.* (1996) and Riach and Rich (2006) find that women are more likely to be discriminated against in higher statuses and higher senior positions. Neumark, *et al.* (1996), in an audit study addressing gender discrimination in restaurant hiring, show that men have much better success in getting job offers in high-priced restaurants where the salary is high and women succeed in getting offers in low-priced restaurants, with corresponding low salaries. Some discrimination against women is expected to be found. The following hypotheses follow this line of argument:

Hypothesis 1a. In the hiring process, the estimated probability of replies and callbacks to women with Portuguese Master's degrees (PMDs) is lower than the estimated probability of replies and callbacks to men with PMDs.

Hypothesis 1b. In the hiring process, the estimated probability of replies and callbacks to women with foreign Master's degrees (FMDs) is lower than the estimated probability of replies and callbacks to men with FMDs.

2.2. Hiring, gender and human capital

In the last 15-20 years, women were able to raise both real earnings and employment levels in relative terms compared to men. In a recent study, covering 35 countries, Wirth (2004) finds that women made up between 40 and 60 per cent of all tertiary education in 26 countries. In universities, women are already in majority (Blau and Kahn, 2007) and showing an increase in their qualifications. However, their high level of education does not correspond to the positions they occupy in the labor market. Women tend to choose study areas that do not provide them with the skills which allow them to follow more aspiring careers and progress into higher qualified, managerial positions. Women have a tendency to adapt the subjects they study and their occupation choice accordingly to jobs which are more "appropriate" for women, hence maintaining occupational sex segregation.

As women have exceeded the educational levels of men, they have also progressively gained access to jobs which are normally men stereotyped. These choices are growing and we progressively find women in non-traditional "female" occupations. They have increasingly achieved skilled jobs in areas of management, business, and finance (Betrand and Hallock, 2001). The fair representation of women in these specific activities suggests that there is no gender segregation in these sectors. In the Portuguese labor market, women represent 46% of financial and insurance activities and in administrative and support services the ratio is 57% (Ministério do Trabalho e da Solidariedade Social, 2010a).

Considering that finance and insurance activities are more demanding and skilled than the administrative and support services, it seems that employers do not recognize women's investment in education, selecting them for poorer and lower skilled occupations.

Table 1: Distribution of people employed on 31 Dec 2008 by gender

	Total	Men	Men (%)	Women	Women (%)
Financial, accounting and insurance activities	69,435	37,773	54%	31,66	46%
Administrative and support services	99,722	42,711	43%	57,01	57%

Source: Ministério do Trabalho e da Solidariedade Social (2010a)

If an employer judges the workers based on their prior beliefs and the worker is aware of this, there are no (or limited) rewards for this investment. Hence, based on the arguments presented above:

Hypothesis 2a. In the hiring process, the estimated probability of replies and callbacks to women with PMDs is similar to the estimated probability of replies and callbacks to women with FMDs.

Hypothesis 2b. In the hiring process, the estimated probability of replies and callbacks to men with PMDs is lower than the estimated probability of replies and callbacks to men with FMDs.

Hypothesis 2c. In the hiring process, the estimated probability of replies and callbacks to women with FMDs is lower than the estimated probability of replies and callbacks to men with PMDs.

2.3. Hiring, gender and dispersion

We want to know, for a specific industry/occupation, if there is significant discrimination against women, and in which way. Since certain jobs are typically female or male, the labor market is segregated on gender (Brannan, M. and Priola, V., 2009), therefore, when assessing job applicants, employers may differ in gender given the nature of the profession. If certain jobs are perceived as more appropriate for men (such as a truck driver or construction worker), female applicants may be (implicitly or explicitly) evaluated less favorably (Anker, 1997) because they do not fit society's beliefs about what is appropriate for women. A series of company surveys (Paukert, 1995) analyzed the influence of sex stereotyping in occupational segregation by sex. In general, until the end of the 1990s, all the studies tended to find discrimination against women in male-dominated and mixed occupations and reverse discrimination (against men) in female-dominated occupations (Riach and Rich, 2002). Many employers indicated that a person's sex is an important consideration which affects hiring. From name-based experiments in Israel, Fershtman and Gneezy (2001) found that observed discrimination is against males, and primarily practiced by males. In another study of salary differences between males and females in the UK, Chevalier (2007) found that unlike their male counterparts, women are more likely to be altruistic and less career-oriented and invest in different types of human capital. If women were excessively represented in lower status groups and at the lower levels of the corporate ladder, as Ibarra (1993) documented, women's homophilic attitude would be negatively correlated to the positional (vertical and horizontal) power of their network contacts. In addition, Weichselbaumer (2004) finds significant discrimination in sex typed occupations, and Riach and Rich (2002), find that discrimination against men in female occupations tends

to be much higher than against women in male occupations. In two different kinds of research, Riach and Rich (2002, 2006) find that in male-dominated occupations, women encountered discrimination twice as much as the male rate. On the other hand, sex-based occupational segregation also affects women positively as it shields some females' occupations from male competition (Kandolin, 1993), and maintains the demand for female labor (Letho, 1991). We infer that in female-dominated occupations, we will find a pro-female bias. The following hypothesis follows this line of argument:

Hypothesis 3a. In the hiring process, in female dominated occupations the estimated probability of replies and callbacks to women with PMDs is higher than the estimated probability of replies and callbacks to men with PMDs.

Hypothesis 3b. In the hiring process, in female dominated occupations the estimated probability of replies and callbacks to women with FMDs is higher than the estimated probability of replies and callbacks to men with FMDs.

Hypothesis 3c. In the hiring process, in female dominated occupations the estimated probability of replies and callbacks to women with PMDs is lower than the estimated probability of replies and callbacks to women with FMDs.

2.4. Hiring and the glass-ceiling

Although much referred to by government officials, gender disparities remain important, particularly concerning working arrangements (especially the use of part-time, fixed term contracts or poorly paid, lower quality jobs). When it comes to the level of labor market-entry, there is a larger consensus amongst researchers (Arulampalam *et al.*, 2005; Duarte *et al.*, 2010) that inequality is usually less significant. Younger women, especially business school graduates, appear to settle their conditions as effectively as their male colleagues do. In addition, Jacobs (1992) and

Cohen *et al.* (1998) found that there was little or no difference in the initial male and female job conditions, but there was a significant gap after several years of tenure. Wirth (2004) discusses women's substantial gains in management but also what remains of the "glass-ceiling" that hinders their rise to the very top hierarchies. The results of Krymkowski and Mintz (2008) suggest the presence of a ceiling effect: it is easier for women to break into male-dominated occupations initially than to keep moving up in their careers. She points out that women have benefited from new educational and training opportunities in large numbers, and that has had a significant bearing on their rise in the hierarchy. Some authors perceive the difference in hiring possibilities as evidence in gender discrimination and failure in labor markets, both of which must be corrected through public policy intervention (Babcock and Laschever, 2003). Legislation encouraging gender quotas in top positions has been adopted in some countries and is being considered in many others. This decision of gender parity in managerial positions lies in the extremely low percentage of women in managerial positions within companies. Because in Portugal there is no such regulation, we do expect the hiring process will continue contributing to the presence of the glass-ceiling. Thus:

> *Hypothesis 4a. In the hiring process, the estimated probability of replies and callbacks to women with PMDs for managerial levels will be lower than the estimated probability of replies and callbacks to men with PMDs.*
>
> *Hypothesis 4b. In the hiring process, the estimated probability of replies and callbacks to women with FMDs for managerial levels will be lower than the estimated probability of replies and callbacks to men with FMDs.*

2.5. Hiring and company region

Several advantages that companies find to be better for their business define their regional location as well as population demographic characteristics are partially behind economic development. Presently, company preference is the Coastal region and metropolitan areas of larger cities. In these regions, discrimination perceptions are lower, considering the high level of social heterogeneity.

In previous studies (Kaas and Manger, 2010; Wood *et al.*, 2009), was tested whether company's location influencing the number of each candidate's replies. Kaas and Manger (2010) divided the replies into three possible locations in Germany: south, east and others, noting that there was a greater discrimination against minority groups in eastern Germany. Wood *et al.* (2009) studied ethnic discrimination in various cities in the UK and found no statistically significant differences in the discrimination between them. Moreover, in Australia, Booth *et al.* (2010) found no significant differences between the discrimination level of various minority groups under study in the cities of Sydney, Melbourne and Brisbane. As a consequence, we hypothesized the following:

Hypothesis 5. During the hiring process, the gender discrimination gap against women in different regions of the country will be similar.

2.6. Hiring and company size

Since larger companies have a standardized recruitment process, more frequently they also discriminate less than the smaller companies (Kass and Manger, 2010). Large companies have more vacancies to fill and, in principle, with a more standardized hiring

process, it may predict feeble discrimination. We believe that in small and medium-sized companies, with a less standardized hiring process, they will have fewer vacancies. But considering the number of small and medium-sized companies existent in the market and their difficulty in belonging to specific social and lobbying networking, we do believe that small and medium-sized companies preferentially use open internet sites specialized in hiring advertisements or specialized subcontracted manpower companies. Thus, they may have fewer vacancies individually, but overall, they may provide the majority of job advertisements in the market. Kaas and Manger (2010) find that small companies have a greater degree of discrimination against candidates from minority groups. In a different research, Carlsson and Rooth (2006) find that companies with more than 100 employees discriminated less, explaining that larger companies are expected to have a more comprehensive hiring process and less statistical discrimination. Stronger discrimination in small companies may indicate that the employer interacts more closely with his/her employees on a daily basis, which may let "social taste" affect his or her judgment more than with an employer in a larger company. The following hypotheses follow this line of argument:

Hypothesis 6a. In the hiring process, in small companies, the estimated probability of replies and callbacks to women with PMDs is lower than the estimated probability of replies and callbacks to men with PMDs.

Hypothesis 6b. In the hiring process, in small companies, the estimated probability of replies and callbacks to women with FMDs is lower than the estimated probability of replies and callbacks to men with FMDs.

3. METHODS

We examine gender discrimination during the hiring process using the Corresponding Test. Our correspondence testing procedure measures the reply rate and callback rate for an interview. By means of correspondence testing, we aim to detect gender discrimination in the preliminary stage of the selection process, which for women seems to be a crucial barrier in the labor market.

3.1. Correspondence test

The correspondence test is a practice of social experiments in a real life situation that has the potential to organize statistical data on discriminatory behaviors. This method provides a powerful means of isolating causal mechanisms. Following Riach and Rich (2002, 2006), in correspondence testing, we considered four individuals that are matched for all relevant characteristics other than gender. The same curriculum vitae can send a different signal depending on the applicant's gender.

The data for this study is from the callbacks of the pairs of carefully-matched fictitious resumes that were sent in response to real job needs posted on some internet websites and in the most outspread weekly newspaper (Expresso). The field experiment was conducted in financial, accounting and insurance activities as well as administrative and support services.

For these activities, we formed an occupational classification, based on the job advertisement description, and we defined three occupational categories: *i*) executive, managerial and supervisory; *ii*) technicians and specialized workers; and, *iii*) clerical workers and administrative support. The first corresponds to better jobs and are associated with prestige and higher salaries. Technicians and specialized workers

involve less supervision but are still well paid jobs. The last category corresponds to the lowest salaries.

3.2. Procedures

The applicants have identical productive characteristics (age, qualification, job experience), but have a male and female name respectively, and obtained their Master's degree either in Portugal (PMD) or in a European country (FMD). If all applicants are invited to a job interview, this is interpreted as a case of equal treatment, if one applicant is invited but another is not, this is measured as discrimination.

With this method, we are sure that the candidates' personality and physical appearance will not affect the selection process to be called for the interview. The fact that all applicants are fictitious allows a perfect control of observable characteristics, and a complete disclosure of experimental details (Bertrand and Mullainathan, 2004; Carlsson and Rooth, 2007; Riach and Rich, 2002, 2006).

3.2.1. Design of the correspondence test

Similar to the studies of Neumark et al. (1996) and Riach and Rich (2002, 2006), amongst others, gender is differentiated by names, which are traditional Portuguese first names and surnames in order to avoid any possible discrimination based on race. To capture the impact of the observed value of high human capital, we consider two types of tertiary education: foreign, when the Master's degree is obtained in a business school outside Portugal; and, national, when it is obtained in a Portuguese business school. With this, we want to understand the impact of going abroad to obtain an international Master's degree. For this comparison, the other applicants have exactly the same level

of education; however, they have a Master's degree which was achieved in Portuguese business schools.

The difference between these two types of education in the applicants should reveal the employer's observed human capital value, for both women and men. Each of the four fictitious applicants: *i)* one female name with a PMD; *ii)* one female name with a foreign master's degree (FMD); *iii)* one male name with a PMD; and, *iv)* one male name with a FMD - all have similar experience in the finance and service sector and no unemployment period.

The application letters and the curricula vitae were not strictly identical to avoid identification, but the applicants were carefully matched in all essential personnel and ability characteristics. For each job advertisement, the four applicants were endowed with similar qualifications, past work experience, personnel background, marital status (single), hobbies, typical Portuguese first and family names, driving license, residence area, mobile phones and age.

We created four e-mail addresses: these were compiled with the names of each applicant and are registered on hotmail.com and yahoo.com. Applicants of each name/Master's degree have different telephone numbers.

Finally, despite the fact that we do not expect to have answers from employers by postal mail, we incorporated a physical address in the applications. The four physical addresses we used were in comparable socio-economic areas in central Portugal. However rare, any attempt by employers to write to applicants by postal mail can be measured in our experiment since the addresses are real. All this information (names, addresses, phone numbers and e-mail addresses) is considered in the resumes when responding to the job advertisements.

3.2.2. Implementation of the correspondence test

Considering that the style or the content of a particular application might influence employers' responses, the application letters alternated regularly among each pair of candidates in balanced proportion. Furthermore, the applications did not incorporate any photographs. In Portugal, the public institution that centralizes most of the clerical and managerial job offers in the labor market is the IEFP (Instituto do Emprego e Formação Profissional). So, we decided on the IEFP job offer portal, with daily updating. In order to get a larger, representative sample, we also used several private websites specialized in job offers and company's own web pages dedicated to recruitment, we also considered a weekly newspaper (Expresso) with a Section dedicated to job advertisements. Adopting this methodology, we are behaving as real candidates would in the labor market in order to find a job.

3.2.3. Application mailing

The applications were sent between September 2010 and February 2011. In order to control the timespan of the job advertisement response, the four applicants' replies were answered online on the same day, with a gap of around one hour amongst each applicant, in order to avoid detection by sending the applications in at the same time through the website of the advertising company.

Besides banking and insurance activity, we have chosen to send the applications to all job advertisements which matched our applicants' profiles. This means that we replied to adverts for accountants, controllers, budget and control technicians, auditing, top and middle managers, administrative technicians, staff, etc. At the beginning, we focused on permanent contracts for real vacancy jobs, but we found that the contract for

the majority of "look like" jobs at large and well-known companies are in fact done with small recruiter companies instead of a contract with the "flag" company.

3.2.4. *Closing the field experiment and result analysis*

The answer to the application is recorded as "reply" when applicants are contacted for: *i)* asking for more information; *ii)* invited to an interview, and; *iii)* the application is rejected. The answer to the applicant is recorded as "callback" when applicants are invited for an interview.

When an applicant received an invitation for a job interview or for some clarification by letter or telephone, a telephone call was made or a written answer was given to decline the invitation, to minimize any inconvenience to the potential employer. To avoid detection, in a man's application it was a male voice that would make the phone call and a female's voice in the reverse case. After the closing date of the field experiment, to validate all the callbacks, we considered an extra period of ten days, waiting for the last replies. Thus, we have statistically robust confidence that the discrimination estimations from this study are true for the occupations we tested.

3.3. The statistical model

We have prepared a set of statistical analyses to identify any gender discrimination during the hiring process in the Portuguese labor market. Our statistical model estimation would be more informative than simply comparing the numbers of men and women who receive callbacks for interviews. Whenever an applicant received any of three replies, we considered it as one reply. Moreover, when they received an invitation for an interview, we registered it as a callback. Within this concept, the employer's response can be a reply to the received application (we nominated it as REPLY) and/or can be an invitation to an interview (that we nominated as CALLBACK). For each pair of comparable candidates, the possible response is: both received a reply/callback; no-one received one, or only one applicant received it. For the callback rate design, we consider the methodology of the International Labor Organization (ILO): cases where neither applicant is contacted or does not receive any type of reply - are disregarded, which means that our callback rates are calculated as follows:

$$\text{Callback Rate First} = \frac{\text{Callback First}}{\text{Reply Both + Reply only First + Reply only Second}}$$

$$\text{Callback Rate Second} = \frac{\text{Callback Second}}{\text{Reply Both + Reply only First + Reply only Second}}$$

3.4. The variables

The variables of the study can be classified into two categories; variables that describe the employers and variables that describe the applicants. Table 2 identifies the variables, providing their description, scale and measures.

Table 2: Variables considered in the analysis

EXPLANATORY			
FEMEDUNAT	Dummy variable of candidate	Binary	1=if a woman applicant with Portuguese master degree 0=no
FEMEDUFOR	Dummy variable of candidate	Binary	1=if a woman applicant with foreign master degree 0=no
MALEDUNAT	Dummy variable of candidate	Binary	1=if a man applicant with Portuguese master degree 0=no
MALEDUFOR	Dummy variable of candidate	Binary	1=if a man applicant with foreign master degree 0=no
BET0_10	Dummy variable of size of firm	Binary	1=if firm has between 1-10 employees 0=no
BET11_50	Dummy variable of size of firm	Binary	1=if firm has between 11-50 employees 0=no
BET51_250	Dummy variable of size of firm	Binary	1=if firm has between 51-250 employees 0=no
BET251_500	Dummy variable of size of firm	Binary	1=if firm has between 251-500 employees 0=no
MORE501	Dummy variable of size of firm	Binary	1=if firm has more than 501 employees 0=no
LISBON	Dummy variable of region	Binary	1=if location is in Lisbon region 0=no
OPORTO	Dummy variable of region	Binary	1=if location is in Oporto region 0=no
SOUTH_SEASIDE	Dummy variable of region	Binary	1=if location is in South/ Seaside region 0=no
LITORAL	Dummy variable of region	Binary	1=if location is in Litoral region 0=no
INTERIOR	Dummy variable of region	Binary	1=if location is in Interior region 0=no
MANAGER	Dummy variable of function level	Binary	1=if the job ad is for manager position 0=no
TECHNICIANS	Dummy variable of function level	Binary	1=if the job ad is for technician position 0=no
CLERK	Dummy variable of function level	Binary	1=if the job ad is for clerk position 0=no
CONSUMER GOODS	Dummy variable of industry	Binary	1=if the job ad is in the consumer goods industry 0=no
DISTRIBUTION	Dummy variable of industry	Binary	1=if the job ad is in the distribution industry 0=no
ELECTRONICS	Dummy variable of industry	Binary	1=if the job ad is in the electronic industry 0=no
PHARMACEUTICS	Dummy variable of industry	Binary	1=if the job ad is in the pharmaceitic industry 0=no
FINANCE_SERVICES	Dummy variable of industry	Binary	1=if the job ad is in the finance service industry 0=no
SERVICES	Dummy variable of industry	Binary	1=if the job ad is in the service industry 0=no
TELECOMUNICATIONS	Dummy variable of industry	Binary	1=if the job ad is in the telecomunication industry 0=no
COMMERCE	Dummy variable of industry	Binary	1=if the job ad is in the commerce industry 0=no
SUBCONTRACT	Dummy variable of recruiter	Binary	1=if the recruiter is a specialized company 0=no
TYPE	Dummy variable of nacionality	Binary	1=if firm is national owned 0=no
GENERAL_ADMINISTRATION	Dummy variable of occupation	Binary	1=if the job ad is for general administration area 0=no
HUMAN_RESOURCES	Dummy variable of occupation	Binary	1=if the job ad is for human resources area 0=no
MARKETING	Dummy variable of occupation	Binary	1=if the job ad is for marketing area 0=no
PRODUCTION	Dummy variable of occupation	Binary	1=if the job ad is for production area 0=no
FINANCE	Dummy variable of occupation	Binary	1=if the job ad is for finance area 0=no
IT	Dummy variable of occupation	Binary	1=if the job ad is for IT area 0=no
LAW AND PUBLIC RELATIONS	Dummy variable of occupation	Binary	1=if the job ad is for law and public relations area 0=no
LOGISTICS	Dummy variable of occupation	Binary	1=if the job ad is for logistics area 0=no
ADMINISTRATIVE	Dummy variable of occupation	Binary	1=if the job ad is for administrative area 0=no
FEMALE_OCCUPATION	Dummy variable of dispersion	Binary	1=if the job ad is for Gen. Adm., HR or Administrative 0=no

4. RESULTS

4.1. Descriptive statistics

Following Riach and Rich (2002), we present the full results of our field experiment. This includes the procedure adopted and the complete results of all tests, broken down into all variables considered in the study. We considered the percentage of times that potential employers treated the four applicants differently compared to a reference individual (woman with a national Master's degree). Comprehensive results thus cover: when both were rejected or invited and when only the female or male applicant received a reply or was invited to an interview. The outcome of our correspondence testing was thus first set out in a format that followed Riach and Rich (2002).

Hiring and gender

The figures in Table 3 compare the results of the female applicant with a PMD with the results of the other applicants.

Table 3: Descriptive Results for Correspondence Testing - All Jobs

		Reply Both	Reply None	Reply Only First	Reply Only Second	Call Back First	Call Back Second	Call Back Rate First (%)	Call Back Rate Second (%)	Difference (p.p.)	X^2
All Applicants	Total Jobs= 505										
FemEduNat	vs. FemEduFor	36	371	40	58	40	24	7%	18%	-10	6.77*
FemEduNat	vs. MalEduNat	29	403	47	26	47	21	17%	21%	-4	0.52
FemEduNat	vs. MalEduFor	33	396	43	33	43	23	12%	21%	-9	3.38***

Notes: This table reports, for each respondent group and in total, in how many cases both of the applicants, no applicants, only the first or only the second applicant received a contact (positive or negative); and, in how many cases the woman with a PMD was invited to an interview (Callback First) as well as in how many cases each respondent group was invited to an interview (Callback Second); the callback rates for the applicants and the difference in callback rates are also presented. FemEduNat = Woman with a PMD. FemEduFor = Woman with a FMD. MalEduNat = Man with a PMD. MalEduFor = Man with a FMD. Significance of X^2: *, **, *** indicates that the observed difference is statistically significant at 1%, 5% and 10%, respectively.

The results of our matched applications estimate the presence and extent of discrimination in hiring, and whether it is statistically significant. This table shows that 505 employers participated, corresponding to 2,020 job applications sent out to the four candidates. The first row compares the result for the woman with a PMD and the woman with a FMD. In 36 cases, both were contacted (column 1), in 371 cases, none were contacted (column 2), in 40 cases, only the woman with a PMD was contacted (column 3), and in 58 cases, only the woman with a FMD was contacted (column 4). Of these contacts the result was: in 10 cases, the woman with a PMD was invited to an interview (column 5), and in 24 cases, the woman with a FMD was invited to an interview (column 6). The next two columns show that the callback rate is 0.07 for the woman with a PMD and 0.18 for the woman with a FMD. In column 9, we present the difference in a callback rate of 10 percentage points which, as shown by X^2 (column 10) is statistically significant at 1% significance level. The other two lines present the results in a similar way, but for men with a PMD and a FMD. Averaging across all jobs, we observe substantial discrimination against female candidates with a PMD. As shown by X^2, differences between women and men with a FMD are statistically significant at 1% and 10%, respectively. The differences between applicants are easy to see in Graph 1.

Graph 1: Descriptive Results for Correspondence Testing - All Jobs
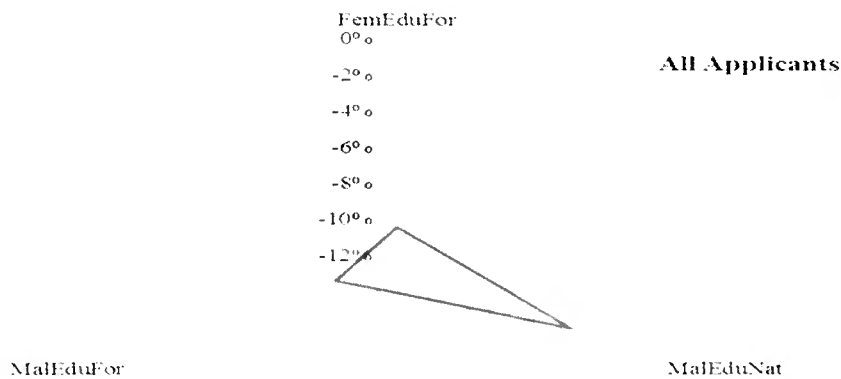
Next tables present the results by company size, region, function level, type, and female dominated occupations in a similar way.

Hiring, gender and human capital

Based on Table 3, we can see that employers perceive foreign education achieved by both candidates (women and men). Differences are statistically significant at 1% significance level for women and at 10% significance level for men. We find an irrelevant perception between men and women, showing that there is no discrimination.

Hiring, gender and dispersion

Results show that in female dominated occupations (see Table 4 and Graph 2), women with FMD are preferred in comparison to other women (difference is statistically significant at 1% significance level). In addition, women have more invitations than men in both situations showing that in female dominated occupations, there is discrimination against men.

Table 4: Descriptive Results for Correspondence Testing – Female Dominated Occupations

	Reply Both	Reply None	Reply Only First	Reply Only Second	Call Back First	Call Back Second	Call Back Rate First (%)	Call Back Rate Second (%)	Difference (p.p.)	χ^2
Female Dominated Occupations Jobs = 99										
FemEduNat vs. FemEduFor	6	73	20	0	0	6	0%	23%	-23	7,8*
FemEduNat vs. MalEduNat	1	84	14	0	5	3	33%	20%	13	0,7
FemEduNat vs. MalEduFor	2	85	12	0	4	3	29%	21%	7	0,19

Notes: Similar notes as for Table 3.

Gender stereotyping is one of the explanations that might cause this pro-female bias in occupations that are heavily female. More research remains to be done in teasing out the workings of these demand-side mechanisms.

Graph 2: Descriptive Results for Correspondence Testing – Female Dominated Occupations

Hiring and the glass-ceiling

By function level, Table 5 and Graph 3 show that differences in callbacks can be observed in lower level job positions. In these less demanding skilled jobs, discrimination against women persists and they are requested to have higher levels of education. This situation is extremely serious in this crisis period, because it prevents women from getting normal, available jobs from the labor market.

### Table 5: Descriptive Results for Correspondence Testing – Function Level

	Reply Both	Reply None	Reply Only First	Reply Only Second	Call Back First	Call Back Second	Call Back Rate First (%)	Call Back Rate Second (%)	Difference (p.p.)	χ^2
Function Level Managers Jobs = 49										
FemEduNat vs. FemEduFor	6	37	6	0	0	0	0%	0%	0	-
FemEduNat vs. MalEduNat	2	41	6	0	4	0	50%	0%	50	8*
FemEduNat vs. MalEduFor	3	41	5	0	3	0	38%	0%	38	4,8**
Function Level Technicians Jobs = 227										
FemEduNat vs. FemEduFor	10	181	36	0	4	8	9%	17%	-9	1,56
FemEduNat vs. MalEduNat	10	190	27	0	4	7	11%	19%	-8	0,97
FemEduNat vs. MalEduFor	8	187	32	0	6	9	15%	23%	-8	0,75
Functions Level Clerk Jobs = 229										
FemEduNat vs. FemEduFor	20	153	56	0	6	16	8%	21%	-13	5,51**
FemEduNat vs. MalEduNat	17	172	40	0	9	14	16%	25%	-9	1,38
FemEduNat vs. MalEduFor	22	168	39	0	4	14	7%	23%	-16	6,88*

Notes: Similar notes as for Table 3.

However, in managerial ranks, where higher levels of abilities are required, the discrimination is against men. Results show a gap of 38% against men with FMD (the difference is statistically significant at a 5% significance level). The difference found for women with PMD suggests that a man with a FMD is, on average, more likely to get a callback compared to a man with a PMD.

Graph 3: Descriptive Results for Correspondence Testing – Function Level

Hiring and the company region

When comparing all the callback rates by regions (see Table 6 and Graph 4) we generally find that differences are against women, but the values are not statistically significant. It is worth noting that there is no strong evidence that companies in different regions favor women or men. So we can only note that, generally, companies do not prefer women with PMD.

Table 6: Descriptive Results for Correspondence Testing – Region

			Reply Both	Reply None	Reply Only First	Reply Only Second	Call Back First	Call Back Second	Call Back Rate First (%)	Call Back Rate Second (%)	Difference (p.p.)	χ^2
Region: Lisbon		Jobs = 364										
FemEduNat	vs.	FemEduFor	24	268	72	0	9	15	9%	16%	-6	1,73
FemEduNat	vs.	MalEduNat	19	294	51	0	14	13	20%	19%	-1	0,05
FemEduNat	vs.	MalEduFor	24	291	49	0	9	13	12%	18%	-5	0,86
Region: Oporto		Jobs = 63										
FemEduNat	vs.	FemEduFor	3	48	12	0	0	4	0%	27%	-27	5,45**
FemEduNat	vs.	MalEduNat	2	53	8	0	1	1	10%	10%	0	0
FemEduNat	vs.	MalEduFor	1	49	13	0	2	4	14%	29%	-14	0,88
Region: South/Seaside		Jobs = 13										
FemEduNat	vs.	FemEduFor	0	10	3	0	0	1	0%	33%	-33	1,5
FemEduNat	vs.	MalEduNat	0	13	0	0	0	0	0%	0%	0	-
FemEduNat	vs.	MalEduFor	0	12	1	0	0	1	0%	100%	-100	-
Region: Litoral		Jobs = 31										
FemEduNat	vs.	FemEduFor	6	20	5	0	0	2	0%	18%	-18	2,44
FemEduNat	vs.	MalEduNat	6	19	6	0	0	3	0%	25%	-25	4**
FemEduNat	vs.	MalEduFor	5	18	8	0	1	3	8%	23%	-15	1,24
Region: Interior		Jobs = 34										
FemEduNat	vs.	FemEduFor	3	25	6	0	1	2	11%	22%	-11	0,41
FemEduNat	vs.	MalEduNat	2	24	8	0	2	4	20%	40%	-20	1
FemEduNat	vs.	MalEduFor	3	26	5	0	1	2	13%	25%	-13	0,42

Notes: Similar notes as for Table 3.

The Lisbon and Oporto regions preferred women with FMD, revealing that employers recognize and give importance to human capital investment, thereby expecting a higher productivity. The difference in the number of callbacks for Oporto is statistically significant at the 5% level.

Graph 4: Descriptive Results for Correspondence Testing – Region
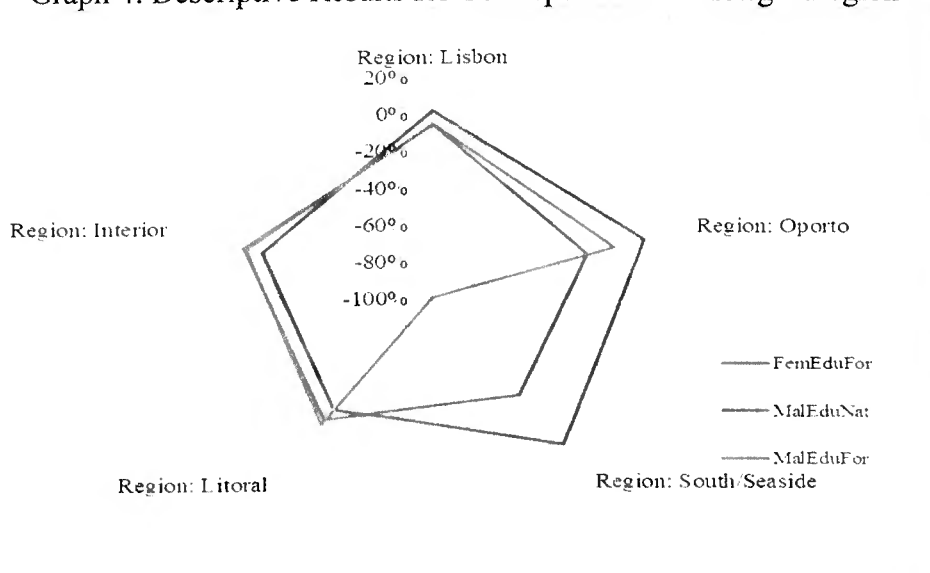
Hiring and company size

Table 7 and Graph 5 show a substantial heterogeneity over company size. The discrimination level against women is exceedingly high for medium-sized companies (between 51-250 employees).
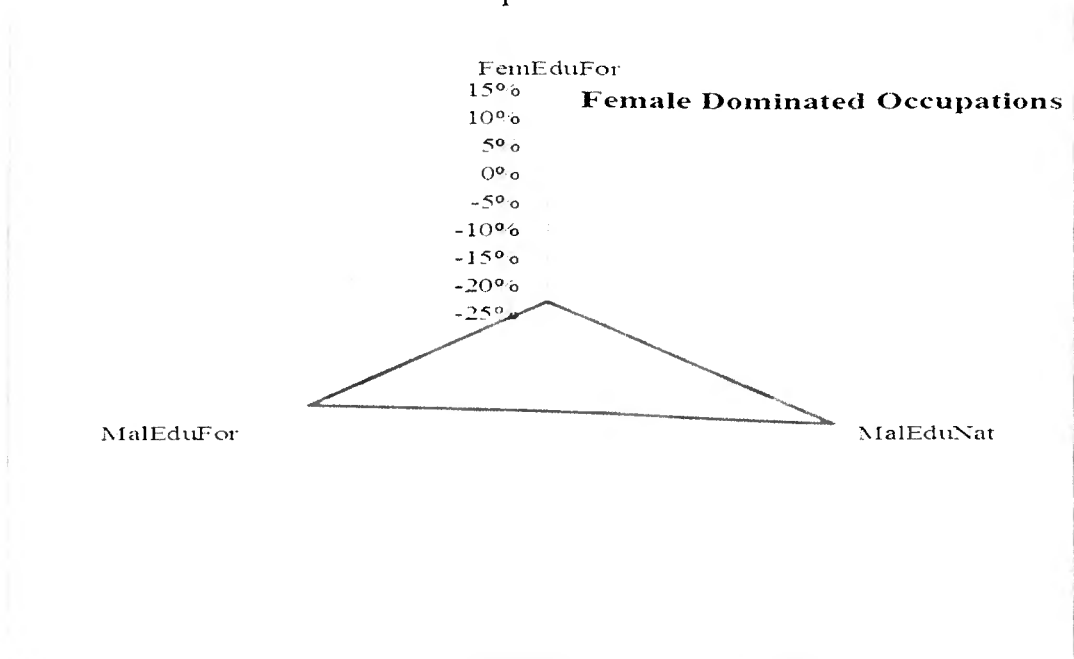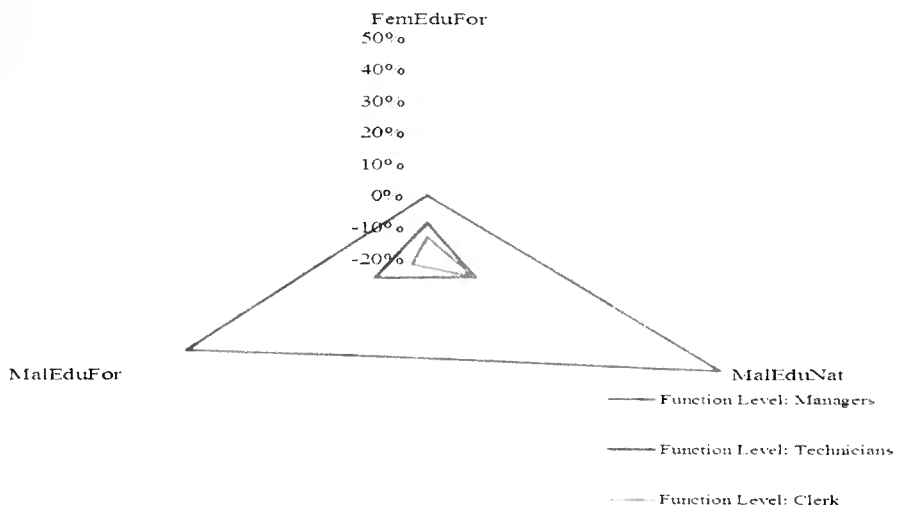
Table 7: Descriptive Results for Correspondence Testing – Company Size

	Reply Both	Reply None	Reply Only First	Reply Only Second	Call Back First	Call Back Second	Call Back Rate First (%)	Call Back Rate Second (%)	Difference (p.p.)	χ^2
Region: Lisbon Jobs = 364										
FemEduNat vs. FemEduFor	24	268	72	0	9	15	9%	16%	-6	1,73
FemEduNat vs. MalEduNat	19	294	51	0	14	13	20%	19%	-1	0,05
FemEduNat vs. MalEduFor	24	291	49	0	9	13	12%	18%	-5	0,86
Region: Oporto Jobs = 63										
FemEduNat vs. FemEduFor	3	48	12	0	0	4	0%	27%	-27	5,45**
FemEduNat vs. MalEduNat	2	53	8	0	1	1	10%	10%	0	0
FemEduNat vs. MalEduFor	1	49	13	0	2	4	14%	29%	-14	0,88
Region: South/Seaside Jobs = 13										
FemEduNat vs. FemEduFor	0	10	3	0	0	1	0%	33%	-33	1,5
FemEduNat vs. MalEduNat	0	13	0	0	0	0	0%	0%	0	-
FemEduNat vs. MalEduFor	0	12	1	0	0	1	0%	100%	-100	-
Region: Litoral Jobs = 31										
FemEduNat vs. FemEduFor	6	20	5	0	0	2	0%	18%	-18	2,44
FemEduNat vs. MalEduNat	6	19	6	0	0	3	0%	25%	-25	4**
FemEduNat vs. MalEduFor	5	18	8	0	1	3	8%	23%	-15	1,24
Region: Interior Jobs = 34										
FemEduNat vs. FemEduFor	3	25	6	0	1	2	11%	22%	-11	0,41
FemEduNat vs. MalEduNat	2	24	8	0	2	4	20%	40%	-20	1
FemEduNat vs. MalEduFor	3	26	5	0	1	2	13%	25%	-13	0,42

Notes: Similar notes as for Table 3.

As shown by X^2, this difference is statistically significant at 10% level. We find higher discrimination against women in a medium-sized company, which means that we cannot state that larger companies have lower discrimination levels.

Graph 5: Descriptive Results for Correspondence Testing – Company Size
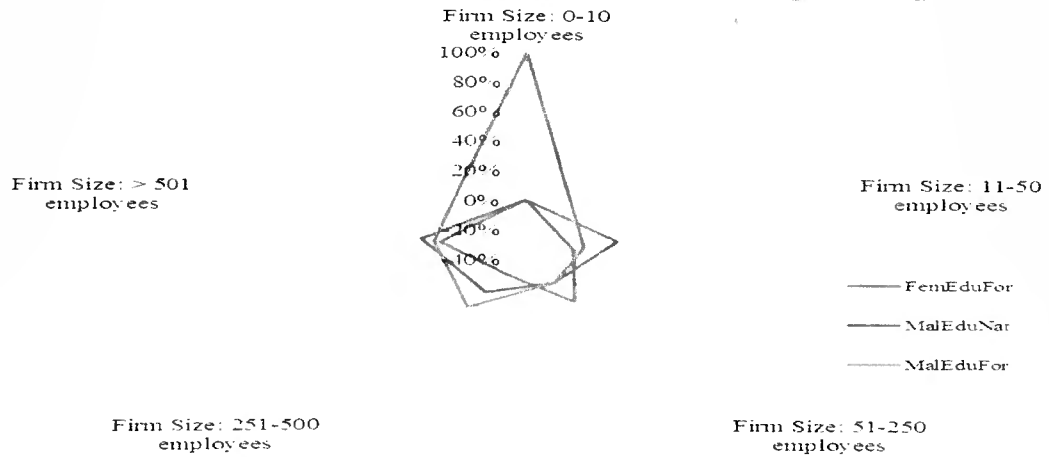
Type and subcontracting recruiter

Considering that companies are domestic or multinational, we can also analyze the comparison of callback rate (see Table 8 and Graphs 6 and 7), and we are able to find that the discrimination gap is more pronounced in multinational companies and it is against women applicants with local Master's degrees. Again, employers prefer female applicants with FMD. As X^2 shows, this difference is statistically significant at 10% level.

Table 8: Descriptive Results for Correspondence Testing – Subcontracting and Company Type

	Reply Both	Reply None	Reply Only First	Reply Only Second	Call Back First	Call Back Second	Call Back Rate First (%)	Call Back Rate Second (%)	Difference (p.p.)	X^2
Subcontract Jobs = 75										
FemEduNat vs. FemEduFor	4	48	23	0	4	6	15%	22%	-7	0,5
FemEduNat vs. MalEduNat	6	58	11	0	2	4	12%	24%	-12	0,83
FemEduNat vs. MalEduFor	4	53	18	0	4	7	18%	32%	-14	1,12
	Reply Both	Reply None	Reply Only First	Reply Only Second	Call Back First	Call Back Second	Call Back Rate First (%)	Call Back Rate Second (%)	Difference (p.p.)	X^2
Type - Multinational Jobs = 307										
FemEduNat vs. FemEduFor	22	228	57	0	7	15	9%	19%	-10	3,45***
FemEduNat vs. MalEduNat	21	251	35	0	8	12	14%	21%	-7	0,98
FemEduNat vs. MalEduFor	21	245	41	0	8	13	13%	21%	-8	1,45

Notes: Similar notes as for Table 3.

Graph 6: Descriptive Results for Correspondence Testing – Subcontracting
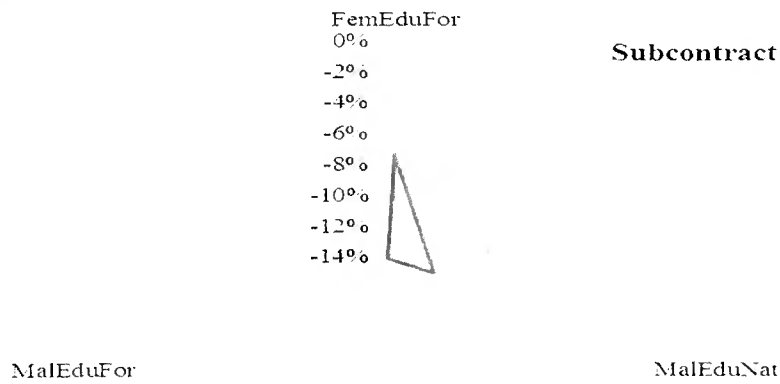
Graph 7: Descriptive Results for Correspondence Testing – Type-Multinational
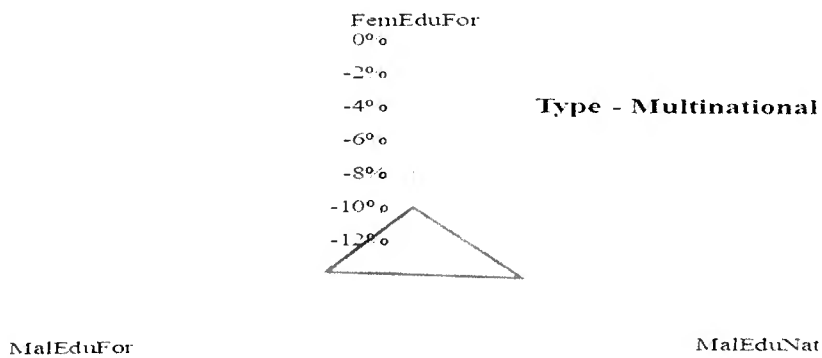
4.2. Modeling discrimination

The main goal of this thesis is to identify any gender-related determinants of discrimination during the hiring processes in the Portuguese labor market. In order to perform further statistical tests on the data, we estimate separate *Logit* models to estimate the probability of receiving a reply or a callback for a job interview:

$$Y_i^*(\text{Reply}=1) = \alpha + GX_i + e_i 1, \qquad (1)$$

$$Y_i^*(\text{Callback}=1) = \alpha + GX_i + e_i 1, \qquad (2)$$

where: Y^* is the latent variable reflecting the probability of receiving a reply or/and a callback for a job interview, α is a constant, X refers to gender, which equals one (zero) if the candidate is female (in all other cases), e is the disturbance, and i refers to the individual. In correspondence testing (see Bertrand and Mullainathan, 2004; Carlsson and Rooth, 2007; Riach and Rich, 2002), all applicants must be matched in all characteristics other than gender. Having controlled all the characteristics except gender in two applicants, the latter was not expected to be correlated with the error term in each equation. If $\hat{G} = 0$ the female and male applicants had the same probability of receiving a reply or/and a callback for a job interview. If $\hat{G} < 0$, the female applicant had a lower probability of receiving reply or/and a callback for a job interview than the male, whereas if $\hat{G} > 0$, the female applicant had a higher probability of receiving reply or/and a callback for a job interview than the male. As our data allows the investigation of whether the determinants of the REPLY have the same behavior as those of CALLBACK, we estimated two regressions for each hypothesis we want to test.

This permits us to test for differences in the discrimination against each of the four groups, while controlling other variables and defining whether discrimination relates to those variables. Firstly, we analyze the differences between the estimated probabilities

of receiving a reply after sending applications to employment advertisements as well as

the differences in the estimated probability of being invited to the interview (callback)

for the four applicants. Secondly, we determine which variable (if any) is associated

with treating the applicants differently, analyzing the relation between company-specific

attributes and job characteristics. The purpose is to investigate what typifies employers

that act in function of the applicant name and/or of their qualifications.

5. DISCUSSION AND RESULT ANALYSIS

Tables 9 and 10 show the results. As can be seen, the estimated models are statistically significant according to the Likelihood-Ratio (LR) probability test and the explanatory power evaluated by the McFadden R-squared (the figure is around 13% in REPLY and in CALLBACK).

Table 9: Estimation of the model of REPLIES – Hiring and Gender

Variable	Coefficient	Std. Error	z-Statistic	Prob.	
CONSUMER_GOODS	0,372	0,568	0,655	0,513	
COMMERCE	-2,309	0,647	-3,569	0,000	*
DISTRIBUTION	1,427	0,411	3,474	0,001	*
ELECTRONICS	-0,506	0,405	-1,250	0,211	
SERVICES	0,857	0,306	2,800	0,005	*
FINANCE_SERVICES	1,021	0,423	2,412	0,016	**
TELECOMUNICATIONS	1,328	0,508	2,615	0,009	*
LISBON	-0,631	0,308	-2,047	0,041	**
OPORTO	-0,896	0,377	-2,375	0,018	**
SOUTH_SEASIDE	-1,980	0,881	-2,248	0,025	**
LITORAL	0,230	0,379	0,608	0,543	
TYPE	0,290	0,233	1,247	0,213	
BET_0_10	0,282	0,741	0,380	0,704	
BET_11_50	-0,222	0,276	-0,805	0,421	
BET_51_250	0,149	0,353	0,423	0,672	
BET_251_500	-0,885	0,470	-1,881	0,060	***
MANAGER	-0,867	0,572	-1,515	0,130	
TECHNICIAN	-0,571	0,170	-3,355	0,001	*
GEN_ADM_	2,177	0,673	3,237	0,001	*
FINANCE	1,019	0,344	2,966	0,003	*
HR	0,169	0,806	0,210	0,834	
MARKETING	1,964	0,325	6,047	0,000	*
SUBCONTRACT	0,374	0,215	1,740	0,082	***
FEMEDUFOR	0,340	0,219	1,551	0,121	
MALEDUNAT	0,105	0,228	0,460	0,646	
MALEDUFOR	0,256	0,223	1,149	0,250	
C	-3,505	0,520	-6,735	0,000	*

McFadden R-squared	0.168454	Mean dependent var	0.105002
S.D. dependent var	0.306633	S.E. of regression	0.287054
Akaike info criterion	0.585441	Sum squared resid	1.641.405
Schwarz criterion	0.660468	Log likelihood	-5.640.029
Hannan-Quinn criter.	0.612976	Restr. log likelihood	-6.782.579
LR statistic	2.285.099	Avg. log likelihood	-0.279348
Prob(LR statistic)	0.000000		

Obs with Dep=0	1807	Total obs	2019
Obs with Dep=1	212		

Notes: Dependent variable is REPLY. *Logit* model has been estimated by maximum likelihood, using the econometrics software Eviews. Method: ML-Binary *Logit* (Quadratic hill climbing), with QML (Huber/White test) standard errors and covariance. Due to the dummy variables trap, omitted variables are OTHERS, INTERIOR, MORE501, CLERK, IT, LAW_PUB_REL, PRODUCTION, LOGISTICS, ADMINISTRATIVE, FEMEDUNAT. *p<0.01; **p<0.05; ***p< 0.1.

Table 10: Estimation of the model of CALLBACKS – Hiring and Gender

Variable	Coefficient	Std. Error	z-Statistic	Prob.	
CONSUMER_GOODS	-0,272	0,553	-0,491	0,623	
COMMERCE	-1,354	0,424	-3,192	0,001	*
DISTRIBUTION	0,814	0,405	2,008	0,045	**
ELECTRONICS	-0,549	0,329	-1,671	0,095	***
PHARMACEUTICS	-1,010	0,624	-1,619	0,106	
SERVICES	0,617	0,247	2,494	0,013	**
FINANCE_SERVICES	1,006	0,353	2,851	0,004	*
TELECOMUNICATION	0,224	0,545	0,411	0,681	
LISBON	-0,577	0,269	-2,148	0,032	**
OPORTO	-0,695	0,326	-2,130	0,033	**
SOUTH_SEASIDE	-1,457	0,641	-2,272	0,023	**
LITORAL	0,230	0,344	0,670	0,503	
TYPE	0,126	0,211	0,596	0,551	
BET_0_10	-0,202	0,670	-0,301	0,763	
BET_11_50	-0,347	0,253	-1,370	0,171	
BET_51_250	-0,055	0,284	-0,195	0,845	
BET_251_500	-0,183	0,402	-0,455	0,649	
MANAGER	-0,982	0,490	-2,003	0,045	**
TECHNICIAN	-0,499	0,145	-3,442	0,001	*
GEN_ADM_	1,878	0,580	3,237	0,001	*
FINANCE	0,740	0,258	2,868	0,004	*
HR	-0,697	0,773	-0,901	0,367	
LAW_PUB_REL	-0,088	0,746	-0,118	0,906	
MARKETING	1,422	0,250	5,681	0,000	*
SUBCONTRACT	0,367	0,185	1,986	0,047	**
FEMEDUFOR	0,291	0,180	1,617	0,106	
MALEDUNAT	-0,415	0,200	-2,076	0,038	**
MALEDUFOR	-0,184	0,190	-0,969	0,333	
C	-2,174	0,426	-5,102	0,000	*

McFadden R-squared	0,1328	Mean dependent var	0,1441	
S.D. dependent var	0,3512	S.E. of regression	0,3304	
Akaike info criterion	0,7438	Sum squared resid	2,1728	
Schwarz criterion	0,8243	Log likelihood	-7,2220	
Hannan-Quinn criter.	0,7733	Restr. log likelihood	-8,3277	
LR statistic	2,2115	Avg. log likelihood	-0,3575	
Prob(LR statistic)	0,0000			

Obs with Dep=0	1.729	Total obs	2.020
Obs with Dep=1	291		

Notes: Dependent variable is CALL. *Logit* model has been estimated by maximum likelihood, using the econometrics software Eviews. Method: ML-Binary *Logit* (Quadratic hill climbing), with QML (Huber/White test) standard errors and covariance. Due to the dummy variables trap, omitted variables are OTHERS, INTERIOR, MORE501, CLERK, IT, PRODUCTION, LOGISTICS, ADMINISTRATIVE, FEMEDUNAT. *p<0.01; **p<0.05; ***p< 0.1.

As we have several dummies in the explanatory variables set and due to the perfect co-linearity problems (the dummies trap), the dummy female applicant with a Portuguese Master's degree has been excluded (FEMEDUNAT). This is the reference variable, providing a suitable way to distinguish the difference between the female

applicants with the FMD (FEMEDUFOR), the male applicants with PMD (MALEDUNAT) and the male applicants with FMD (MALEDUFOR).

In the model with REPLY as a dependent variable (Table 9), the estimates for the coefficients of variables FEMEDUFOR, MALEDUNAT and MALEDUFOR are all positive but not statistically significant. These results suggest non-existent discrimination against women with PMD. Nevertheless, in the model with CALLBACK as a dependent variable, the estimates for the coefficient of the variable MALEDUNAT is negative and statistically significant (at 5% significance level). With these results, we can conclude that, on average, female applicants with a PMD have higher estimated probabilities of receiving an invitation for an interview than male applicants with PMD. This result is consistent with other research (Fernandez and Weinberg, 1997). This is not in accordance with our hypotheses and the identified pattern in other research, that is, women would be treated unequally. Thus, these results do not support our hypotheses 1a and 1b where we predicted discrimination against women in the hiring process.

Next, we analyze whether the estimated probability of being contacted or offered to attend an interview varies between applicants with PMD and applicants with FMD. Testing for hypothesis 2a, we use previous *Logit* models to analyze how the offer estimation probability varies. In both, the REPLY model and the CALL model, the coefficient of the variable FEMEDUFOR is not statistically significant. For hypothesis 2b (see Table 11 for callback model, in Annex I we present the reply model), the coefficient of the variable MALEDUFOR is not statistically significant. Both hypotheses suggest that employers neglect applicants' human capital skill. Hypothesis 2c anticipated that the estimated probability of replies and of callbacks to women with

FMD would be lower than the estimated probability of replies and of callbacks to men

with a national Master's degree. Our findings are twofold: in REPLY model (see Annex

III), the coefficients of the variables are not statistically significant and in the CALL

model (see Annex II), the coefficients of MALEDUNAT and MALEDUFOR are

negative and statistically significant at 1% of significance level.

Table 11: Estimation of the model of CALLBACKS - Hiring, gender and human capital

Variable	Coefficient	Std. Error	z-Statistic	Prob.	
CONSUMER_GOODS	0,045	0,500	0,090	0,928	
COMMERCE	-1,144	0,410	-2,794	0,005	*
DISTRIBUTION	1,090	0,366	2,974	0,003	*
ELECTRONICS	-0,360	0,326	-1,105	0,269	
SERVICES	0,789	0,247	3,195	0,001	*
FINANCE_SERVICES	1,211	0,340	3,565	0,000	*
TELECOMUNICATIONS	0,609	0,488	1,247	0,212	
LISBON	-0,536	0,266	-2,013	0,044	**
OPORTO	-0,671	0,325	-2,061	0,039	**
SOUTH_SEASIDE	-1,413	0,641	-2,203	0,028	**
LITORAL	0,244	0,343	0,712	0,476	
TYPE	0,180	0,204	0,882	0,378	
BET_0_10	-0,232	0,668	-0,348	0,728	
BET_11_50	-0,358	0,251	-1,427	0,154	
BET_51_250	-0,100	0,282	-0,356	0,722	
BET_251_500	-0,517	0,349	-1,483	0,138	
MANAGER	-0,954	0,482	-1,980	0,048	**
TECHNICIAN	-0,503	0,145	-3,460	0,001	*
GEN_ADM_	1,845	0,569	3,243	0,001	*
FINANCE	0,747	0,250	2,989	0,003	*
HR	-0,694	0,771	-0,901	0,368	
MARKETING	1,395	0,237	5,882	0,000	*
SUBCONTRACT	0,333	0,184	1,809	0,070	**
FEMEDUFOR	0,704	0,193	3,642	0,000	*
MALEDUFOR	0,230	0,203	1,130	0,258	
FEMEDUNAT	0,414	0,199	2,074	0,038	**
C	-2,797	0,426	-6,558	0,000	*

McFadden R-squared	0,1310	Mean dependent var	0,1441	
S.D. dependent var	0,3512	S.E. of regression	0,3306	
Akaike info criterion	0,7432	Sum squared resid	217,8421	
Schwarz criterion	0,8182	Log likelihood	-723,6572	
Hannan-Quinn criter.	0,7707	Restr. log likelihood	-832,7745	
LR statistic	218,2346	Avg. log likelihood	-0,3582	
Prob(LR statistic)	0,0000			

Obs with Dep=0	1.729	Total obs	2.020
Obs with Dep=1	291		

Notes: Dependent variable is CALL. Logit model has been estimated by maximum likelihood, using the econometrics software Eviews. Method: ML-Binary Logit (Quadratic hill climbing), with QML (Huber/White test) standard errors and covariance. Due to the dummy variables trap, omitted variables are OTHERS, INTERIOR, MORE501, CLERK, LAW_PUB_REL, PRODUCTION, LOGISTICS, ADMINISTRATIVE, MALEDUNAT. *p<0.01; **p<0.05; ***p< 0.1.

These findings suggest that women present a higher estimated probability in receiving callbacks. These results show similar conclusions as other research (Bertrand and Hallock, 2001). Therefore, we cannot accept the null hypotheses 2a, 2b and 2c. Subsequently, we considered how gender and dispersion relates to discrimination (if any). To analyze the impact of company size in the number of replies and callback among the applicant groups, we create the variable FEMALE_DOMIN, which includes the following areas: General Administration, Human Relations and Administrative [following similar criteria of Ortin_Angel and Salas Fumas (1998)]. In order to test for hypotheses 3a, 3b and 3c, we created four dummy variables with the interaction effect among the four applicant variables as well as the female dominated variable and estimated two *Logit* models for each dependent dummy variable: REPLY (see Annex IV) and CALLBACK (see Table 12).

Table 12: Estimation of the model of CALLBACKS - Hiring, gender and dispersion

Variable	Coefficient	Std. Error	z-Statistic	Prob.	
CONSUMER_GOODS	-0,257	0,564	-0,455	0,649	
COMMERCE	-1,354	0,418	-3,242	0,001	*
DISTRIBUTION	0,831	0,409	2,033	0,042	**
ELECTRONICS	-0,538	0,329	-1,636	0,102	
PHARMACEUTICS	-0,995	0,622	-1,599	0,110	
SERVICES	0,613	0,250	2,449	0,014	**
FINANCE_SERVICES	1,005	0,351	2,861	0,004	*
TELECOMUNICATIONS	0,235	0,550	0,428	0,669	
LISBON	-0,571	0,266	-2,147	0,032	**
OPORTO	-0,693	0,326	-2,123	0,034	**
SOUTH_SEASIDE	-1,483	0,660	-2,245	0,025	**
LITORAL	0,229	0,342	0,671	0,502	
TYPE	0,124	0,213	0,582	0,560	
BET_0_10	-0,233	0,687	-0,339	0,735	
BET_11_50	-0,341	0,255	-1,339	0,181	
BET_51_250	-0,056	0,282	-0,198	0,843	
BET_251_500	-0,186	0,407	-0,456	0,648	
MANAGER	-0,959	0,503	-1,904	0,057	***
TECHNICIAN	-0,472	0,146	-3,224	0,001	*
GEN_ADM	1,817	0,634	2,867	0,004	*
FINANCE	1,033	0,312	3,307	0,001	*
HR	-0,875	0,825	-1,061	0,289	
LAW_PUB_REL	0,219	0,791	0,277	0,781	
MARKETING	1,718	0,309	5,552	0,000	*
SUBCONTRACT	0,369	0,185	1,992	0,046	**
FEMEDUFOR*FEMALE_DOMIN	1,438	0,441	3,261	0,001	*
MALEDUNAT*FEMALE_DOMIN	-0,354	0,615	-0,576	0,565	
MALEDUFOR*FEMALE_DOMIN	-0,354	0,597	-0,592	0,554	
C	-2,545	0,458	-5,562	0,000	*

McFadden R-squared	0,1364	Mean dependent var	0,1441	
S.D. dependent var	0,3512	S.E. of regression	0,3307	
Akaike info criterion	0,7408	Sum squared resid	217,710	
Schwarz criterion	0,8213	Log likelihood	-719,195	
Hannan-Quinn criter.	0,7704	Restr. log likelihood	-832,775	
LR statistic	227,1581	Avg. log likelihood	-0,3560	
Prob(LR statistic)	0,0000			

Obs with Dep=0	1.729	Total obs	2.020
Obs with Dep=1	291		

Notes: Dependent variable is CALL. Logit model has been estimated by maximum likelihood, using the econometrics software Eviews. Method: ML-Binary Logit (Quadratic hill climbing), with QML (Huber/White test) standard errors and covariance. Due to the dummy variables trap, omitted variables are OTHERS, INTERIOR, MORE501, CLERK, PRODUCTION, LOGISTICS, ADMINISTRATIVE, FEMEDUNAT*FEMALE_DOMIN. *p<0.01; **p<0.05; ***p< 0.1.

Results suggest that in female dominated occupations, women with PMD are not positively discriminated against men with PMD (the coefficients are not statistically significant). Additionally, we find that women with FMD, in female dominated occupations, present a higher probability to receive callbacks than men with FMD. The coefficient of MALEDUFOR*FEMALE_DOMIN is negative and statistically

significant at 5% of significance level. Furthermore, our results suggest that women with a FMD present a higher probability in getting replies and callbacks than women with PMD. In both models (see Annexes V and VI), the coefficients of the variable FEMEDUFOR*FEMALE_DOMIN are statistically significant (at a 5% and 1% significance level respectively). Thus, we can confirm hypothesis 3c.

Hypotheses 4a and 4b anticipated that the estimated probability of replies and callbacks to female applicants for job advertisements at management level would be lower than for men no matter what the human capital skills. As shown in our model (see Table 13), analyzing the outcome of the occupation level with applicants, we find that women with PMD (FEMEDUNAT) present the highest estimated probability in getting replies and receiving callbacks than men with PMD, the coefficients are statistically significant (at 10% and 5% significance level). We also find that women with PMD have the highest estimated probability in receiving callbacks for managerial positioned advertisements.

Table 13: Estimation of the model of CALLBACKS – Hiring and glass-ceiling (H4a)

Variable	Coefficient	Std. Error	z-Statistic	Prob.	
CONSUMER_GOODS	-0,225	0,560	-0,402	0,688	
COMMERCE	-1,287	0,418	-3,078	0,002	*
DISTRIBUTION	0,841	0,401	2,096	0,036	**
ELECTRONICS	-0,512	0,325	-1,573	0,116	
PHARMACEUTICS	-1,004	0,608	-1,651	0,099	**
SERVICES	0,655	0,248	2,642	0,008	*
FINANCE_SERVICES	1,084	0,345	3,139	0,002	*
TELECOMUNICATIONS	0,344	0,551	0,624	0,533	
LISBON	-0,568	0,266	-2,137	0,033	**
OPORTO	-0,724	0,326	-2,225	0,026	**
SOUTH_SEASIDE	-1,425	0,656	-2,173	0,030	**
LITORAL	0,201	0,341	0,590	0,555	
TYPE	0,143	0,209		0,493	
BET_0_10	-0,250	0,642	-0,389	0,698	
BET_11_50	-0,317	0,251	-1,266	0,206	
BET_51_250	-0,029	0,277	-0,103	0,918	
BET_251_500	-0,183	0,398	-0,460	0,645	
GEN_ADM	1,600	0,457	3,503	0,001	*
FINANCE	0,532	0,259	2,049	0,041	**
HR	-0,987	0,775	-1,275	0,202	
LAW_PUB_REL	-0,035	0,765	-0,046	0,964	
MARKETING	1,400	0,251	5,571	0,000	*
SUBCONTRACT	0,341	0,182	1,874	0,061	***
FEMEDUFOR*MANAGER	0,124	0,487	0,255	0,799	
MALEDUNAT*MANAGER	-1,818	0,813	-2,236	0,025	**
MALEDUFOR*MANAGER	-1,373	0,720	-1,908	0,056	***
C	-2,441	0,399	-6,117	0,000	*

McFadden R-squared	0,1237	Mean dependent var	0,1441	
S.D. dependent var	0,3512	S.E. of regression	0,3326	
Akaike info criterion	0,7493	Sum squared resid	220,520	
Schwarz criterion	0,8243	Log likelihood	-729,762	
Hannan-Quinn criter.	0,7768	Restr. log likelihood	-832,775	
LR statistic	206,0245	Avg. log likelihood	-0,3613	
Prob(LR statistic)	0,0000			

Obs with Dep=0	1.729	Total obs	2.020
Obs with Dep=1	291		

Notes: Dependent variable is CALL. Logit model has been estimated by maximum likelihood, using the econometrics software Eviews. Method: ML-Binary Logit (Quadratic hill climbing), with QML (Huber/White test) standard errors and covariance. Due to the dummy variables trap, omitted variables are OTHERS, INTERIOR, MORE501, CLERK, PRODUCTION, LOGISTICS, ADMINISTRATIVE, FEMEDUNAT*MANAGER. *$p<0.01$; **$p<0.05$; ***$p<0.1$.

Additionally, women with FMD present a higher estimated probability of callbacks than men do (see Table 14). The coefficient is statistically significant at 5% significance level.

The analysis for REPLY (see Annexes VII and VIII) model shows no significant coefficients. Therefore, these results do not support Hypotheses 4a and 4b, suggesting that glass-ceiling effect, at this stage of labor market pre-entrance, does not take place.

Table 14: Estimation of the model of CALLBACKS – Hiring and glass-ceiling (H4b)

Variable	Coefficient	Std. Error	z-Statistic	Prob.	
CONSUMER_GOODS	-0,266	0,559	-0,477	0,633	
COMMERCE	-1,354	0,420	-3,226	0,001	*
DISTRIBUTION	0,822	0,399	2,057	0,040	**
ELECTRONICS	-0,547	0,326	-1,676	0,094	***
PHARMACEUTICS	-0,998	0,620	-1,610	0,107	
SERVICES	0,615	0,248	2,480	0,013	**
FINANCE_SERVICES	0,999	0,351	2,843	0,005	*
TELECOMUNICATIONS	0,227	0,543	0,419	0,675	
LISBON	-0,575	0,265	-2,168	0,030	**
OPORTO	-0,692	0,325	-2,126	0,034	**
SOUTH_SEASIDE	-1,464	0,658	-2,224	0,026	**
LITORAL	0,232	0,341	0,681	0,496	
TYPE	0,125	0,212	0,588	0,557	
BET_0_10	-0,208	0,673	-0,310	0,757	
BET_11_50	-0,344	0,254	-1,354	0,176	
BET_51_250	-0,055	0,282	-0,196	0,844	
BET_251_500	-0,184	0,401	-0,457	0,647	
MANAGER	-0,251	0,583	-0,430	0,667	
TECHNICIAN	-0,495	0,144	-3,438	0,001	*
GEN_ADM	1,883	0,603	3,125	0,002	*
FINANCE	0,734	0,259	2,838	0,005	*
HR	-0,700	0,773	-0,905	0,365	
LAW_PUB_REL	-0,085	0,768	-0,111	0,911	
MARKETING	1,411	0,252	5,607	0,000	*
SUBCONTRACT	0,365	0,184	1,982	0,048	**
FEMEDUNAT*MANAGER	-0,312	0,581	-0,536	0,592	
MALEDUNAT*MANAGER	-1,948	0,852	-2,286	0,022	**
MALEDUFOR*MANAGER	-1,503	0,751	-2,000	0,046	**
C	-2,226	0,412	-5,404	0,000	*

McFadden R-squared	0,1300	Mean dependent var	0,1441	
S.D. dependent var	0,3512	S.E. of regression	0,3312	
Akaike info criterion	0,7461	Sum squared resid	218,364	
Schwarz criterion	0,8266	Log likelihood	-724,525	
Hannan-Quinn criter.	0,7756	Restr. log likelihood	-832,775	
LR statistic	216,4988	Avg. log likelihood	-0,3587	
Prob(LR statistic)	0,0000			

Obs with Dep=0	1.729	Total obs	2.020
Obs with Dep=1	291		

Notes: Dependent variable is CALL. Logit model has been estimated by maximum likelihood, using the econometrics software Eviews. Method: ML-Binary Logit (Quadratic hill climbing), with QML (Huber/White test) standard errors and covariance. Due to the dummy variables trap, omitted variables are OTHERS, INTERIOR, MORE501, CLERK, PRODUCTION, LOGISTICS, ADMINISTRATIVE, FEMEDUFOR*MANAGER. *p<0.01; **p<0.05; ***p< 0.1.

Subsequently, we analyze if the location of companies that place job advertisements can have a different impact on the applicants in the estimated probability of contact or in the estimated probability of callbacks for an interview. We estimated several *Logit*

models. The dependent variables are still the REPLY and CALLBACK. We only present one CALLBACK model (see Table 15), but we also comment on other CALLBACKS and REPLY models, see Annexes IX, X and XI).

Table 15: Estimation of the model of CALLBACKS – Hiring and company region

Variable	Coefficient	Std. Error	z-Statistic	Prob.	
CONSUMER_GOODS	0,018	0,556	0,032	0,975	
COMMERCE	-1,287	0,417	-3,083	0,002	*
DISTRIBUTION	1,049	0,396	2,649	0,008	*
ELECTRONICS	-0,445	0,332	-1,337	0,181	
PHARMACEUTICS	-0.806	0,628	-1,282	0.200	
SERVICES	0,632	0,245	2.580	0,010	*
FINANCE_SERVICES	1,045	0,349	2,997	0,003	*
TELECOMUNICATIONS	0,302	0,534	0,565	0,572	
TYPE	0,171	0,210	0,818	0.413	
BET_0_10	0,240	0,630	0,381	0,703	
BET_11_50	-0,324	0,252	-1.285	0.199	
BET_51_250	-0,062	0,279	-0,221	0,825	
BET_251_500	-0,326	0.417	-0,783	0.434	
MANAGER	-0,845	0,450	-1,879	0,060	**
TECHNICIAN	-0,480	0,143	-3,367	0,001	*
GEN_ADM	1.661	0.544	3,054	0,002	*
FINANCE	0,702	0,260	2,705	0,007	*
HR	-0.757	0,771	-0,981	0.327	
LAW_PUB_REL	-0,058	0,758	-0,076	0,939	
MARKETING	1,436	0,247	5,805	0,000	*
SUBCONTRACT	0.298	0,180	1,655	0,098	
FEMEDUFOR*LISBON	0,437	0,162	2,688	0,007	*
FEMEDUFOR*OPORTO	0,265	0,379	0,701	0,483	
FEMEDUFOR*SOUTH_SEASIDE	0,649	0,777	0,835	0,404	
FEMEDUFOR*LITORAL	0,630	0,477	1,322	0,186	
C	-2.909	0.327	-8,890	0,000	*

McFadden R-squared	0,1182	Mean dependent var	0,1441	
S.D. dependent var	0,3512	S.E. of regression	0.3327	
Akaike info criterion	0,7528	Sum squared resid	220,663	
Schwarz criterion	0,8251	Log likelihood	-734,377	
Hannan-Quinn criter.	0,7794	Restr. log likelihood	-832,775	
LR statistic	196,7947	Avg. log likelihood	-0.3636	
Prob(LR statistic)	0,0000			

Obs with Dep=0	1.729	Total obs	2.020
Obs with Dep=1	291		

Notes: Dependent variable is CALL. Logit model has been estimated by maximum likelihood, using the econometrics software Eviews. Method: ML-Binary Logit (Quadratic hill climbing), with QML (Huber/White test) standard errors and covariance. Due to the dummy variables trap, omitted variables are OTHERS, MORE501, CLERK, PRODUCTION, LOGISTICS, ADMINISTRATIVE, FEMEDUFOR*INTERIOR. *p<0.01; **p<0.05; ***p< 0.1.
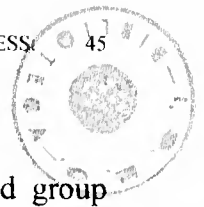
The explanatory variables include company/workplace characteristics and group determinants, as well as the interaction effect between regions and applicants (twenty interaction variables: five regions x four applicants). Our findings show that the Litoral (Coastal) region presents the highest estimated probability in replying to women with FMD (coefficient is statistically significant at 10% significance level, see Annex IX) than the interior regions, and in replies to women with PMD (see Annex X) there are no significant differences. Concerning callbacks, women with FMD in the Lisbon region appear to have the highest estimated probability (coefficient is statistically significant at 1% significance level) than in the Interior regions (see Table 15), and women with PMD in the Litoral region present a higher estimated probability than the South-Seaside region (coefficient is statistically significant at 10% significance level, see Annex XI). Thus, we cannot confirm hypothesis five, stating that there would be no differences between genders in the hiring and recruitment process in all the regions of the country.

There is evidence that small companies have higher discrimination representation than larger companies (Carlsson and Rooth, 2006).

Our results (see Table 16 for CALL model) show that micro companies – with fewer than 10 employees – present a higher estimated probability of replies and callbacks than other company sizes, (all coefficients are statistically significant at 1% significance level). Bearing in mind the discrimination in company size, the coefficient weight of the different interaction variables suggests different insights. It is as easy/difficult for women with PMD to have a reply as it is for men (see Annex XII), but women with FMD have a lower estimated probability (in all cases, coefficients are statistically significant at 1% significance level). With reference to callbacks (see Table 16) both women, with PMD and FMD, present a lower estimated probability than men

do (in all cases, coefficients are statistically significant at 1% significance level). Thus, as small companies present a higher estimated probability in contacting men with FMD than women with FMD and offering an interview to men with PMD and FMD than women, our hypotheses 6a and 6b cannot be rejected.

Table 16: Estimation of the model of CALLBACKS – Hiring and company size

Variable	Coefficient	Std. Error	z-Statistic	Prob.	
CONSUMER_GOODS	-0,556	0,552	-1,007	0,314	
COMMERCE	-1,564	0,408	-3,838	0,000	*
DISTRIBUTION	0,630	0,389	1,621	0,105	
ELECTRONICS	-0,800	0,303	-2,641	0,008	*
PHARMACEUTICS	-1,280	0,620	-2,065	0,039	**
SERVICES	0,428	0,216	1,982	0,047	**
FINANCE_SERVICES	0,752	0,333	2,256	0,024	**
TELECOMUNICATIONS	0,055	0,536	0,102	0,919	
LISBON	-0,726	0,250	-2,898	0,004	*
OPORTO	-0,860	0,307	-2,801	0,005	*
SOUTH_SEASIDE	-1,567	0,623	-2,513	0,012	**
LITORAL	0,065	0,342	0,190	0,849	
TYPE	-0,050	0,201	-0,250	0,802	
MANAGER	-1,001	0,494	-2,029	0,043	**
TECHNICIAN	-0,564	0,143	-3,947	0,000	*
GEN_ADM	1,766	0,578	3,058	0,002	*
FINANCE	0,666	0,243	2,740	0,006	*
HR	-0,762	0,767	-0,993	0,321	
LAW_PUB_REL	-0,172	0,761	-0,226	0,821	
MARKETING	1,314	0,235	5,599	0,000	*
SUBCONTRACT	0,363	0,186	1,953	0,051	***
FEMEDUNAT*BET_11_50	-1,875	0,424	-4,425	0,000	*
FEMEDUNAT*BET_51_250	-2,030	0,481	-4,216	0,000	*
FEMEDUNAT*BET_251_500	-1,819	0,652	-2,792	0,005	*
FEMEDUNAT*MORE_501	-1,455	0,394	-3,692	0,000	*
FEMEDUFOR*BET_11_50	-1,643	0,429	-3,830	0,000	*
FEMEDUFOR*BET_51_250	-1,132	0,461	-2,458	0,014	**
FEMEDUFOR*BET_251_500	-1,406	0,652	-2,156	0,031	**
FEMEDUFOR*MORE_501	-1,674	0,395	-4,234	0,000	*
MALEDUNAT*BET_11_50	-2,483	0,464	-5,350	0,000	*
MALEDUNAT*BET_51_250	-1,957	0,478	-4,090	0,000	*
MALEDUNAT*BET_251_500	-2,405	0,759	-3,170	0,002	*
MALEDUNAT*MORE_501	-2,062	0,437	-4,719	0,000	*
MALEDUFOR*BET_11_50	-2,089	0,423	-4,933	0,000	*
MALEDUFOR*BET_51_250	-1,753	0,478	-3,668	0,000	*
MALEDUFOR*BET_251_500	-1,819	0,673	-2,701	0,007	*
MALEDUFOR*MORE_501	-1,991	0,420	-4,734	0,000	*
C	-2,766	0,368	-8,570	0,000	*

Mean dependent var	0,1441	S.D. dependent var	0,3512	
S.E. of regression	0,3313	Akaike info criterion	0,7525	
Sum squared resid	2176684,0000	Schwarz criterion	0,8553	
Log likelihood	-7230653,0000	Hannan-Quinn criter.	0,7903	
Avg. log likelihood	-0,3580			

Obs with Dep=0	1.729	Total obs	2.020
Obs with Dep=1	291		

Notes: Dependent variable is CALL. Logit model has been estimated by maximum likelihood, using the econometrics software Eviews. Method: ML-Binary Logit (Quadratic hill climbing), with QML (Huber/White test) standard errors and covariance. Due to the dummy variables trap, omitted variables are OTHERS, MORE501, CLERK, PRODUCTION, LOGISTICS, ADMINISTRATIVE, FEMEDUNAT*BET_0_10, FEMEDUFOR*BET_0_10, MALEDUFOR*BET_0_10, MALEDUFOR*BET_0_10. *p<0.01; **p<0.05; ***p< 0.1.

To summarize and to better view the full context of the expected signals of our hypotheses and results, Table 17 is as shown:

Table 17: Summary of expected signals and results

Hypotheses	In the hiring process, the estimated probability of replies and of callbacks to	Model	Expected	Result	Prob.
1a	... women with PMD vs. men with PMD	REPLY	-	n.s.	
		CALL	-	+	**
1b	... women with FMD vs. men with FMD	REPLY	-	n.s.	
		CALL	-	+	*
2a	... women with PMD vs. women with FMD	REPLY	=	n.s.	
		CALL	=	n.s.	
2b	... men with PMD vs. men with FMD	REPLY	-	n.s.	
		CALL	-	n.s.	
2c	... women with FMD vs. men with PMD	REPLY	-	n.s.	
		CALL	-	+	*
3a	In female dominated occupations, ... women with PMD vs. men with PMD	REPLY	+	n.s.	
		CALL	+	n.s.	
3b	In female dominated occupations, ... women with FMD vs. men with FMD	REPLY	+	n.s.	
		CALL	+	+	**
3c	In female dominated occupations, ... women with PMD vs. women with FMD	REPLY	-	-	**
		CALL	-	-	*
4a	To manager level ads, ... women with PMD vs. men with PMD	REPLY	-	+	***
		CALL	-	+	**
4b	To manager level ads, ... women with FMD vs. men with FMD	REPLY	-	n.s.	
		CALL	-	+	**
5	In the different regions of the country, gender discrimination gap against women is similar	REPLY	=	#	***
		CALL	=	#	***
6a	In small firms, ... women with PMD vs. men with PMD	REPLY	-	=	*
		CALL	-	-	*
6b	In small firms, ... women with FMD vs. men with FMD	REPLY	-	-	*
		CALL	-	-	*

Notes: Summary of all Hypotheses with expected signals and results by the two dependent variables (models); REPLY and CALL. Probability: *p<0.01; **p<0.05; ***p< 0.1.

6. CONCLUSIONS

In addition to providing evidence on gender-based differences in economic outcomes for a previously unstudied country, this research advances the works in several ways. The results of this research indicate no conclusive support for discrimination in women during the first phase of the hiring process. Our results suggest that the estimated probabilities of being invited to an interview are mostly in favor of women mainly at callback level.

Both the descriptive statistics, as well as the multivariate analyses show no female disadvantage in getting an offer. There is some advantage when one focuses on the job advertisements with both male and female applicants. Women are at an advantage in getting callbacks, with no evidence of a pro-male bias. There is no question that female callbacks are actively sought for in many positions. The few other studies of hiring in Norway and the U.S. show similar results: little or no female disadvantage in getting offers, with the exception of the U.S. symphony orchestra and the restaurant audit study. But the U.S. evidence points in the same direction (Petersen *et al.*, 2005).

There is a well-documented unexplained employment gap between men and women in the Portuguese labor market that may very well be the result of gender discrimination. There is evidence in the fact that men in Portugal have a considerably higher employment rate than do women. But there is less reason to believe in the presence of discrimination in employers' decisions during the first phase of hiring because there is no relevant difference in current research.

Some curriculum vitae can send different signals depending on the applicant gender. If this happens, controlling application cores do not necessarily lead to a proper discrimination measure. Also, we understand that formal recruitment channels, like

newspaper (internet) advertisements are only one type of job search channel. While no research has been done on the topic in Portugal, research from other countries suggests that for many job advertisements, people are hired through social networks. If women are less likely to have established job relevant social networks, excluding this form of recruitment may underestimate discrimination.

We conducted a correspondence test, sending more than two thousand applications with randomly assigned women and men with PMD and/or FMD. The difference in replies is not significant but, in callbacks is quite different and significant. Several explanations can account for this result. First, we focus on a specific segment of the labor market (financial and insurance activities as well as administrative and support services). Focusing on the selection process and experimentally holding the human capital in a pair of fictitious job applicants constant but varying only in their gender and nature of Master's degree achievement, our results show significant differences in access to occupations.

We hope that this research will stimulate the heads of companies on the issue of segregation/gender discrimination before entering into the labor market and may contribute to reflecting on actions that can and must be achieved in promoting equity and diversity in their organizational structures. Due to rising unemployment in this period of crisis, employers may feel more comfortable in offering women more possibilities to enter the labor market than before. We hope this does not mean an expectation for worse salaries and lower working conditions.

In summary, these results suggest that employers recognize higher abilities or what higher skills reflect about unobserved productivity characteristics for female applicants but not for male applicants. The results indicate that the main effect on callbacks for

women remains favorable and significant for females and negative and insignificant for males.

Although the experiment has provided clear evidence for the non-existence of gender discrimination during the first phase of the hiring process, it has been more difficult to explain why this discrimination occurs in the labor market. Statistical discrimination is often put forward as the most rational reason for discriminatory behavior. And women do, on average, take larger responsibility for the family than men. Relevant educational skills and job commitment are productivity relevant characteristics. But men did not get a higher callback rate than women. So the results of this study do not confirm the "rational" explanatory mechanism behind gender discrimination.

In conclusion, the results in this study suggest that male and female applicants do not always face the same type of employer based on unobserved characteristics. Employers in Portugal appear to have stronger, negative priorities concerning men and women's unobservable characteristics or inflexible tastes for discrimination against women or men. This implies that individual investment in human capital enhancement may not counter unequal treatment in the labor market alone and that other policy initiatives may be necessary to guarantee equal opportunity.

The degree of gender discrimination that we find is best explained in the statement that women with FMD present a higher estimated probability to be invited for an interview for advertised jobs than men with FMD.

The extent of discrimination observed in this experiment directly contradicts any notions of inequality in terms of access to employment. As a whole, women do not face discrimination during the first phase of the hiring process.

Practical Implications

This research contributes to the existing body of literature on discrimination economics according to gender. Portuguese law prohibits discrimination in the areas of employment, including hiring. It is clear from this experiment that discrimination on the basis of gender is not present in Portugal, and when it exists, it is relatively low. Findings suggest little evidence that women face different informal salary offers from employers than men.

Socially, there has been an increased involvement of political and civil society in various areas but the social construction based on differences in gender, segregation and discrimination sources and the unequal social roles has not been completely overthrown. The increased participation of women in the labor market is changing social reality, contributing to change gender relations. While effective discrimination against women may be lessening, the long-term effects of established male networks and their impact on job access may, in effect, cause uncertainty in hiring patterns. The discussion about diversity is already on various company agendas, and reality reveals that inclusion strategies, eventually adopted, are promoting a substantial impact on inequity in the labor market.

Limitations and suggestions for future research

This study has some limitations that must be acknowledged. Firstly, as with all experiments of this nature, a limited number of occupations were tested. It is possible that a different discrimination profile could be found for recruitment in different professions altogether in Portugal, or higher-skilled positions in these professions. Discrimination may also have varied had we tested different groups.

Secondly, although this study focuses on the whole Portuguese labor market testing gender discrimination, an experiment with a larger sample size could detect some differences which have not been observed in this sample. Conducting field experiments in Portugal will always be challenging, given the small size of the labor market. Thirdly, although several studies have examined gender discrimination, very little is known about economy recession and structural unemployment. The potential problem here is that Portugal, as well as almost all European countries, has been in a recession since 2008. The unemployment rate has risen from 8% at the end of 2007 to 13% at the end 2011. Vacancies have decreased dramatically and, particularly in higher-skilled occupations, it would take many years to conduct an experiment of this nature in Portugal. As previously noted, correspondence tests like the one reported here are limited to jobs which require written applications. In addition, future research could study gender discrimination in other fields, away from the workforce, like housing and credit applications in banks. As the success of a field experiment in recruitment depends on sufficient vacancies, most of those mentioned above will be more challenging to conduct in altered economic circumstances. We hope that this study will stimulate more theory building and testing to investigate the hiring process and the role of men and women in the labor market.

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ANNEXES

Annex I: Model to test Hypothesis 2b

Dependent Variable: REPLY
Method: ML - Binary Logit (Quadratic hill climbing)
Sample: 1 2020
Included observations: 2019
Convergence achieved after 6 iterations
QML (Huber/White) standard errors & covariance

Variable	Coefficient	Std. Error	z-Statistic	Prob.	
CONSUMER_GOODS	0,372	0,568	0,655	0,513	
COMMERCE	-2,309	0,647	-3,569	0,000	*
DISTRIBUTION	1,427	0,411	3,474	0,001	*
ELECTRONICS	-0,506	0,405	-1,250	0,211	
SERVICES	0,857	0,306	2,800	0,005	*
FINANCE_SERVICES	1,021	0,423	2,412	0,016	**
TELECOMUNICATIONS	1,328	0,508	2,615	0,009	*
LISBON	-0,631	0,308	-2,047	0,041	**
OPORTO	-0,896	0,377	-2,375	0,018	**
SOUTH_SEASIDE	-1,980	0,881	-2,248	0,025	**
LITORAL	0,230	0,379	0,608	0,543	
TYPE	0,290	0,233	1,247	0,213	
BET_0_10	0,282	0,741	0,380	0,704	
BET_11_50	-0,222	0,276	-0,805	0,421	
BET_51_250	0,149	0,353	0,423	0,672	
BET_251_500	-0,885	0,470	-1,881	0,060	***
MANAGER	-0,867	0,572	-1,515	0,130	
TECHNICIAN	-0,571	0,170	-3,355	0,001	*
GEN_ADM_	2,177	0,673	3,237	0,001	*
FINANCE	1,019	0,344	2,966	0,003	*
HR	0,169	0,806	0,210	0,834	
MARKETING	1,964	0,325	6,047	0,000	*
SUBCONTRACT	0,374	0,215	1,740	0,082	***
FEMEDUFOR	0,236	0,217	1,083	0,279	
MALEDUFOR	0,151	0,221	0,685	0,493	
FEMEDUNAT	-0,105	0,228	-0,460	0,646	
C	-3,400	0,529	-6,432	0,000	***

McFadden R-squared	0,1685	Mean dependent var	0,1050	
S.D. dependent var	0,3066	S.E. of regression	0,2871	
Akaike info criterion	0,5854	Sum squared resid	164,1405	
Schwarz criterion	0,6605	Log likelihood	-564,0029	
Hannan-Quinn criter.	0,6130	Restr. log likelihood	-678,2579	
LR statistic	228,5099	Avg. log likelihood	-0,2793	
Prob(LR statistic)	0,0000			

Obs with Dep=0	1.807	Total obs	2.019
Obs with Dep=1	212		

Annex II: Model to test Hypothesis 2c

Dependent Variable: CALL
Method: ML - Binary Logit (Quadratic hill climbing)
Sample: 1 2020
Included observations: 2020
Convergence achieved after 6 iterations
QML (Huber/White) standard errors & covariance

Variable	Coefficient	Std. Error	z-Statistic	Prob.	
CONSUMER_GOODS	0,045	0,500	0,090	0,928	
COMMERCE	-1,144	0,410	-2,794	0,005	*
DISTRIBUTION	1,090	0,366	2,974	0,003	*
ELECTRONICS	-0,360	0,326	-1,105	0,269	
SERVICES	0,789	0,247	3,195	0,001	*
FINANCE_SERVICES	1,211	0,340	3,565	0,000	*
TELECOMUNICATIONS	0,609	0,488	1,247	0,212	
LISBON	-0,536	0,266	-2,013	0,044	**
OPORTO	-0,671	0,325	-2,061	0,039	**
SOUTH_SEASIDE	-1,413	0,641	-2,203	0,028	**
LITORAL	0,244	0,343	0,712	0,476	
TYPE	0,180	0,204	0,882	0,378	
BET_0_10	-0,232	0,668	-0,348	0,728	
BET_11_50	-0,358	0,251	-1,427	0,154	
BET_51_250	-0,100	0,282	-0,356	0,722	
BET_251_500	-0,517	0,349	-1,483	0,138	
MANAGER	-0,954	0,482	-1,980	0,048	**
TECHNICIAN	-0,503	0,145	-3,460	0,001	*
GEN_ADM_	1,845	0,569	3,243	0,001	*
FINANCE	0,747	0,250	2,989	0,003	*
HR	-0,694	0,771	-0,901	0,368	
MARKETING	1,395	0,237	5,882	0,000	*
SUBCONTRACT	0,333	0,184	1,809	0,070	***
FEMEDUNAT	-0,290	0,180	-1,614	0,107	
MALEDUFOR	-0,474	0,183	-2,588	0,010	*
MALEDUNAT	-0,704	0,193	-3,642	0,000	*
C	-2,093	0,414	-5,059	0,000	*

McFadden R-squared	0,1310	Mean dependent var	0,1441
S.D. dependent var	0,3512	S.E. of regression	0,3306
Akaike info criterion	0,7432	Sum squared resid	217,842
Schwarz criterion	0,8182	Log likelihood	-723,657
Hannan-Quinn criter.	0,7707	Restr. log likelihood	-832,775
LR statistic	218,2346	Avg. log likelihood	-0,3582
Prob(LR statistic)	0,0000		

Obs with Dep=0	1.729	Total obs	2.020
Obs with Dep=1	291		

Annex III: Model to test Hypothesis 2c

Dependent Variable: REPLY
Method: ML - Binary Logit (Quadratic hill climbing)
Sample: 1 2020
Included observations: 2019
Convergence achieved after 6 iterations
QML (Huber/White) standard errors & covariance

Variable	Coefficient	Std. Error	z-Statistic	Prob.	
CONSUMER_GOODS	0,372	0,568	0,655	0,513	
COMMERCE	-2,309	0,647	-3,569	0,000	*
DISTRIBUTION	1,427	0,411	3,474	0,001	*
ELECTRONICS	-0,506	0,405	-1,250	0,211	
SERVICES	0,857	0,306	2,800	0,005	*
FINANCE_SERVICES	1,021	0,423	2,412	0,016	**
TELECOMUNICATIONS	1,328	0,508	2,615	0,009	*
LISBON	-0,631	0,308	-2,047	0,041	**
OPORTO	-0,896	0,377	-2,375	0,018	**
SOUTH_SEASIDE	-1,980	0,881	-2,248	0,025	**
LITORAL	0,230	0,379	0,608	0,543	
TYPE	0,290	0,233	1,247	0,213	
BET_0_10	0,282	0,741	0,380	0,704	
BET_11_50	-0,222	0,276	-0,805	0,421	
BET_51_250	0,149	0,353	0,423	0,672	
BET_251_500	-0,885	0,470	-1,881	0,060	***
MANAGER	-0,867	0,572	-1,515	0,130	
TECHNICIAN	-0,571	0,170	-3,355	0,001	*
GEN_ADM_	2,177	0,673	3,237	0,001	*
FINANCE	1,019	0,344	2,966	0,003	*
HR	0,169	0,806	0,210	0,834	
MARKETING	1,964	0,325	6,047	0,000	*
SUBCONTRACT	0,374	0,215	1,740	0,082	***
FEMEDUNAT	-0,340	0,219	-1,551	0,121	
MALEDUFOR	-0,084	0,212	-0,397	0,691	
MALEDUNAT	-0,236	0,217	-1,083	0,279	
C	-3,164	0,527	-6,002	0,000	*

McFadden R-squared	0,1685	Mean dependent var	0,1050	
S.D. dependent var	0,3066	S.E. of regression	0,2871	
Akaike info criterion	0,5854	Sum squared resid	164,141	
Schwarz criterion	0,6605	Log likelihood	-564,003	
Hannan-Quinn criter.	0,6130	Restr. log likelihood	-678,258	
LR statistic	228,5099	Avg. log likelihood	-0,2793	
Prob(LR statistic)	0,0000			

Obs with Dep=0	1.807	Total obs	2.019
Obs with Dep=1	212		

Annex IV: Model to test Hypothesis 3a

Dependent Variable: REPLY
Method: ML - Binary Logit (Quadratic hill climbing)
Sample: 1 2020
Included observations: 2019
Convergence achieved after 6 iterations
QML (Huber/White) standard errors & covariance

Variable	Coefficient	Std. Error	z-Statistic	Prob.	
CONSUMER_GOODS	0,384	0,578	0,663	0,507	
COMMERCE	-2,306	0,645	-3,575	0,000	*
DISTRIBUTION	1,439	0,410	3,511	0,000	*
ELECTRONICS	-0,494	0,405	-1,221	0,222	
SERVICES	0,851	0,306	2,782	0,005	*
FINANCE_SERVICES	1,030	0,422	2,440	0,015	**
TELECOMUNICATIONS	1,343	0,515	2,608	0,009	*
LISBON	-0,615	0,310	-1,985	0,047	**
OPORTO	-0,882	0,379	-2,325	0,020	**
SOUTH_SEASIDE	-1,992	0,877	-2,270	0,023	**
LITORAL	0,247	0,381	0,648	0,517	
TYPE	0,283	0,234	1,207	0,227	
BET_0_10	0,250	0,728	0,344	0,731	
BET_11_50	-0,213	0,277	-0,771	0,441	
BET_51_250	0,150	0,352	0,425	0,671	
BET_251_500	-0,888	0,473	-1,879	0,060	
MANAGER	-0,845	0,580	-1,456	0,145	
TECHNICIAN	-0,551	0,171	-3,221	0,001	*
GEN_ADM	2,052	0,732	2,802	0,005	*
FINANCE	1,457	0,374	3,893	0,000	*
HR	-0,012	0,866	-0,014	0,989	
MARKETING	2,405	0,357	6,732	0,000	*
SUBCONTRACT	0,380	0,215	1,767	0,077	***
FEMEDUFOR*FEMALE_DOMIN	1,398	0,551	2,536	0,011	**
MALEDUNAT*FEMALE_DOMIN	0,080	0,726	0,111	0,912	
MALEDUFOR*FEMALE_DOMIN	0,331	0,675	0,491	0,623	
C	-3,788	0,528	-7,180	0,000	*

McFadden R-squared	0,1726	Mean dependent var	0,1050	
S.D. dependent var	0,3066	S.E. of regression	0,2869	
Akaike info criterion	0,5827	Sum squared resid	163,954	
Schwarz criterion	0,6577	Log likelihood	-561,186	
Hannan-Quinn criter.	0,6102	Restr. log likelihood	-678,258	
LR statistic	234,1436	Avg. log likelihood	-0,2780	
Prob(LR statistic)	0,0000			

Obs with Dep=0	1.807	Total obs	2.019
Obs with Dep=1	212		

Annex V: Model to test Hypothesis 3c

Dependent Variable: CALL
Method: ML - Binary Logit (Quadratic hill climbing)
Sample: 1 2020
Included observations: 2020
Convergence achieved after 6 iterations
QML (Huber/White) standard errors & covariance

Variable	Coefficient	Std. Error	z-Statistic	Prob.	
CONSUMER_GOODS	-0,278	0,555	-0,502	0,616	
COMMERCE	-1,354	0,419	-3,230	0,001	*
DISTRIBUTION	0,830	0,400	2,074	0,038	**
ELECTRONICS	-0,556	0,325	-1,711	0,087	***
PHARMACEUTICS	-0,987	0,620	-1,591	0,112	
SERVICES	0,623	0,248	2,511	0,012	**
FINANCE_SERVICES	1,003	0,353	2,844	0,005	*
TELECOMUNICATIONS	0,225	0,539	0,418	0,676	
LISBON	-0,592	0,264	-2,243	0,025	**
OPORTO	-0,702	0,324	-2,166	0,030	**
SOUTH_SEASIDE	-1,462	0,661	-2,211	0,027	**
LITORAL	0,219	0,340	0,645	0,519	
TYPE	0,129	0,211	0,612	0,541	
BET_0_10	-0,177	0,687	-0,257	0,797	
BET_11_50	-0,351	0,253	-1,386	0,166	
BET_51_250	-0,054	0,282	-0,193	0,847	
BET_251_500	-0,194	0,400	-0,485	0,628	
MANAGER	-1,020	0,491	-2,075	0,038	**
TECHNICIAN	-0,529	0,145	-3,651	0,000	*
GEN_ADM	2,090	0,603	3,464	0,001	*
FINANCE	0,377	0,279	1,353	0,176	
HR	-0,525	0,786	-0,668	0,504	
LAW_PUB_REL	-0,462	0,778	-0,593	0,553	
MARKETING	1,040	0,278	3,740	0,000	*
SUBCONTRACT	0,369	0,184	2,008	0,045	**
FEMEDUNAT*FEMALE_DOMIN	-0,248	0,419	-0,593	0,553	
MALEDUNAT*FEMALE_DOMIN	-1,175	0,583	-2,015	0,044	**
MALEDUFOR*FEMALE_DOMIN	-1,175	0,561	-2,093	0,036	**
C	-1,835	0,427	-4,294	0,000	*

McFadden R-squared	0,1292	Mean dependent var	0,1441	
S.D. dependent var	0,3512	S.E. of regression	0,3309	
Akaike info criterion	0,7467	Sum squared resid	218,013	
Schwarz criterion	0,8273	Log likelihood	-725,166	
Hannan-Quinn criter.	0,7763	Restr. log likelihood	-832,775	
LR statistic	215,2169	Avg. log likelihood	-0,3590	
Prob(LR statistic)	0,0000			

Obs with Dep=0	1.729	Total obs	2.020
Obs with Dep=1	291		

Annex VI: Model to test Hypothesis 3c

Dependent Variable: REPLY
Method: ML - Binary Logit (Quadratic hill climbing)
Sample: 1 2020
Included observations: 2019
Convergence achieved after 6 iterations
QML (Huber/White) standard errors & covariance

Variable	Coefficient	Std. Error	z-Statistic	Prob.	
CONSUMER_GOODS	0,368	0,570	0,645	0,519	
COMMERCE	-2,313	0,645	-3,584	0,000	*
DISTRIBUTION	1,429	0,406	3,519	0,000	*
ELECTRONICS	-0,514	0,403	-1,274	0,203	
SERVICES	0,860	0,305	2,816	0,005	*
FINANCE_SERVICES	1,014	0,424	2,393	0,017	**
TELECOMUNICATIONS	1,319	0,509	2,591	0,010	*
LISBON	-0,644	0,308	-2,092	0,037	**
OPORTO	-0,907	0,377	-2,403	0,016	**
SOUTH_SEASIDE	-1,985	0,884	-2,246	0,025	**
LITORAL	0,219	0,378	0,578	0,563	
TYPE	0,295	0,232	1,270	0,204	
BET_0_10	0,300	0,735	0,408	0,683	
BET_11_50	-0,227	0,276	-0,824	0,410	
BET_51_250	0,150	0,352	0,424	0,671	
BET_251_500	-0,884	0,467	-1,892	0,059	***
MANAGER	-0,884	0,569	-1,553	0,121	
TECHNICIAN	-0,583	0,170	-3,419	0,001	*
GEN_ADM	2,315	0,691	3,353	0,001	*
FINANCE	0,785	0,370	2,122	0,034	**
HR	0,294	0,827	0,356	0,722	
MARKETING	1,724	0,356	4,840	0,000	*
SUBCONTRACT	0,371	0,215	1,728	0,084	
FEMEDUNAT*FEMALE_DOMIN	-0,295	0,487	-0,606	0,544	
MALEDUNAT*FEMALE_DOMIN	-0,761	0,667	-1,141	0,254	
MALEDUFOR*FEMALE_DOMIN	-0,507	0,608	-0,834	0,404	
C	-3,070	0,536	-5,729	0,000	*

McFadden R-squared	0,1677	Mean dependent var	0,1050	
S.D. dependent var	0,3066	S.E. of regression	0,2869	
Akaike info criterion	0,5860	Sum squared resid	163,923	
Schwarz criterion	0,6610	Log likelihood	-564,520	
Hannan-Quinn criter.	0,6135	Restr. log likelihood	-678,258	
LR statistic	227,4756	Avg. log likelihood	-0,2796	
Prob(LR statistic)	0,0000			

Obs with Dep=0	1.807	Total obs	2.019
Obs with Dep=1	212		

Annex VII: Model to test Hypothesis 4a

Dependent Variable: REPLY
Method: ML - Binary Logit (Quadratic hill climbing)
Sample: 1 2020
Included observations: 2019
Convergence achieved after 6 iterations
QML (Huber/White) standard errors & covariance

Variable	Coefficient	Std. Error	z-Statistic	Prob.	
CONSUMER_GOODS	0,459	0,568	0,809	0,418	
COMMERCE	-2,188	0,646	-3,385	0,001	*
DISTRIBUTION	1,447	0,403	3,595	0,000	*
ELECTRONICS	-0,440	0,404	-1,090	0,276	
SERVICES	0,917	0,305	3,009	0,003	*
FINANCE_SERVICES	1,152	0,415	2,777	0,006	*
TELECOMUNICATIONS	1,491	0,517	2,882	0,004	*
LISBON	-0,632	0,309	-2,045	0,041	**
OPORTO	-0,927	0,378	-2,452	0,014	**
SOUTH_SEASIDE	-1,934	0,883	-2,191	0,029	**
LITORAL	0,185	0,379	0,487	0,626	
TYPE	0,309	0,231	1,340	0,180	
BET_0_10	0,230	0,678	0,340	0,734	
BET_11_50	-0,187	0,272	-0,687	0,492	
BET_51_250	0,171	0,344	0,498	0,619	
BET_251_500	-0,889	0,478	-1,861	0,063	**
GEN_ADM	1,973	0,515	3,831	0,000	+
FINANCE	0,781	0,345	2,260	0,024	**
HR	-0,184	0,811	-0,227	0,821	
MARKETING	1,940	0,328	5,922	0,000	*
SUBCONTRACT	0,353	0,211	1,674	0,094	***
FEMEDUFOR*MANAGER	-0,092	0,538	-0,171	0,865	
MALEDUNAT*MANAGER	-1,399	0,815	-1,717	0,086	***
MALEDUFOR*MANAGER	-0,943	0,737	-1,279	0,201	
C	-3,566	0,490	-7,281	0,000	*

McFadden R-squared	0,1619	Mean dependent var	0,1050	
S.D. dependent var	0,3066	S.E. of regression	0,2879	
Akaike info criterion	0,5879	Sum squared resid	165,221	
Schwarz criterion	0,6574	Log likelihood	-568,473	
Hannan-Quinn criter.	0,6134	Restr. log likelihood	-678,258	
LR statistic	219,5705	Avg. log likelihood	-0,2816	
Prob(LR statistic)	0,0000			

Obs with Dep=0	1.807	Total obs	2.019
Obs with Dep=1	212		

Annex VIII: Model to test Hypothesis 4b

Dependent Variable: REPLY
Method: ML - Binary Logit (Quadratic hill climbing)
Sample: 1 2020
Included observations: 2019
Convergence achieved after 6 iterations
QML (Huber/White) standard errors & covariance

Variable	Coefficient	Std. Error	z-Statistic	Prob.	
CONSUMER_GOODS	0,376	0,575	0,654	0,513	
COMMERCE	-2,311	0,645	-3,581	0,000	*
DISTRIBUTION	1,433	0,404	3,547	0,000	*
ELECTRONICS	-0,506	0,404	-1,253	0,210	
SERVICES	0,856	0,306	2,803	0,005	*
FINANCE_SERVICES	1,020	0,423	2,414	0,016	**
TELECOMUNICATIONS	1,329	0,511	2,603	0,009	*
LISBON	-0,631	0,306	-2,062	0,039	**
OPORTO	-0,896	0,377	-2,379	0,017	**
SOUTH_SEASIDE	-1,988	0,885	-2,247	0,025	**
LITORAL	0,233	0,378	0,617	0,537	
TYPE	0,290	0,233	1,242	0,214	
BET_0_10	0,277	0,727	0,382	0,703	
BET_11_50	-0,221	0,277	-0,800	0,424	
BET_51_250	0,149	0,352	0,424	0,672	
BET_251_500	-0,885	0,468	-1,892	0,059	***
MANAGER	-0,432	0,657	-0,658	0,510	
TECHNICIAN	-0,570	0,170	-3,356	0,001	*
GEN_ADM	2,180	0,682	3,195	0,001	*
FINANCE	1,018	0,344	2,956	0,003	*
HR	0,166	0,806	0,206	0,837	
MARKETING	1,961	0,326	6,011	0,000	*
SUBCONTRACT	0,374	0,214	1,746	0,081	***
FEMEDUNAT*MANAGER	0,000	0,615	0,000	1,000	
MALEDUNAT*MANAGER	-1,310	0,859	-1,524	0,128	
MALEDUFOR*MANAGER	-0,853	0,767	-1,111	0,267	
C	-3,322	0,506	-6,561	0,000	*

McFadden R-squared	0,1692	Mean dependent var	0,1050	
S.D. dependent var	0,3066	S.E. of regression	0,2866	
Akaike info criterion	0,5849	Sum squared resid	163,645	
Schwarz criterion	0,6600	Log likelihood	-563,505	
Hannan-Quinn criter.	0,6125	Restr. log likelihood	-678,258	
LR statistic	229,5059	Avg. log likelihood	-0,2791	
Prob(LR statistic)	0,0000			

Obs with Dep=0	1.807	Total obs	2.019
Obs with Dep=1	212		

Annex IX: Model to test Hypothesis 5 (1)

Dependent Variable: REPLY
Method: ML - Binary Logit (Quadratic hill climbing)
Sample: 1 2020
Included observations: 2019
Convergence achieved after 6 iterations
QML (Huber/White) standard errors & covariance

Variable	Coefficient	Std. Error	z-Statistic	Prob.	
CONSUMER_GOODS	0,578	0,554	1,044	0,297	
COMMERCE	-2,266	0,653	-3,468	0,001	*
DISTRIBUTION	1,619	0,395	4,096	0,000	*
ELECTRONICS	-0,451	0,412	-1,094	0,274	
SERVICES	0,841	0,296	2,838	0,005	*
FINANCE_SERVICES	1,027	0,410	2,501	0,012	**
TELECOMUNICATIONS	1,345	0,507	2,656	0,008	*
TYPE	0,325	0,232	1,400	0,162	
BET_0_10	0,632	0,666	0,949	0,343	
BET_11_50	-0,237	0,279	-0,850	0,395	
BET_51_250	0,122	0,347	0,352	0,725	
BET_251_500	-0,996	0,470	-2,121	0,034	**
MANAGER	-0,715	0,528	-1,353	0,176	
TECHNICIAN	-0,548	0,167	-3,276	0,001	*
GEN_ADM	1,916	0,629	3,048	0,002	*
FINANCE	0,948	0,338	2,803	0,005	*
HR	0,104	0,801	0,130	0,897	
MARKETING	1,952	0,317	6,166	0,000	*
SUBCONTRACT	0,299	0,210	1,421	0,155	
FEMEDUFOR*LISBON	0,098	0,198	0,494	0,621	
FEMEDUFOR*OPORTO	0,236	0,449	0,526	0,599	
FEMEDUFOR*SOUTH_SEASIDE	-0,540	1,279	-0,422	0,673	
FEMEDUFOR*LITORAL	0,820	0,493	1,661	0,097	***
C	-3,901	0,434	-8,993	0,000	*

McFadden R-squared	0,1533	Mean dependent var	0,1050	
S.D. dependent var	0,3066	S.E. of regression	0,2889	
Akaike info criterion	0,5926	Sum squared resid	166,528	
Schwarz criterion	0,6593	Log likelihood	-574,265	
Hannan-Quinn criter.	0,6171	Restr. log likelihood	-678,258	
LR statistic	207,9866	Avg. log likelihood	-0,2844	
Prob(LR statistic)	0,0000			

Obs with Dep=0	1.807	Total obs	2.019
Obs with Dep=1	212		

Annex X: Model to test Hypothesis 5 (2)

Dependent Variable: REPLY
Method: ML - Binary Logit (Quadratic hill climbing)
Date: 09/19/11   Time: 17:38
Sample: 1 2020
Included observations: 2019
Convergence achieved after 6 iterations
QML (Huber/White) standard errors & covariance

Variable	Coefficient	Std. Error	z-Statistic	Prob.	
CONSUMER_GOODS	0,638	0,551	1,159	0,247	
COMMERCE	-2,266	0,651	-3,482	0,001	*
DISTRIBUTION	1,589	0,398	3,995	0,000	*
ELECTRONICS	-0,452	0,412	-1,098	0,272	
SERVICES	0,842	0,297	2,835	0,005	*
FINANCE_SERVICES	1,026	0,410	2,503	0,012	**
TELECOMUNICATIONS	1,342	0,506	2,651	0,008	**
TYPE	0,326	0,230	1,419	0,156	
BET_0_10	0,678	0,668	1,015	0,310	
BET_11_50	-0,222	0,278	-0,800	0,424	
BET_51_250	0,133	0,344	0,386	0,699	
BET_251_500	-0,981	0,472	-2,079	0,038	**
MANAGER	-0,703	0,527	-1,335	0,182	
TECHNICIAN	-0,539	0,168	-3,212	0,001	*
GEN_ADM	1,924	0,627	3,067	0,002	*
FINANCE	0,970	0,339	2,864	0,004	*
HR	0,118	0,800	0,147	0,883	
MARKETING	1,982	0,317	6,263	0,000	*
SUBCONTRACT	0,273	0,210	1,297	0,195	
FEMEDUNAT*LISBON	-0,190	0,212	-0,900	0,368	
FEMEDUNAT*OPORTO	-0,878	0,588	-1,492	0,136	
FEMEDUNAT*INTERIOR	0,155	0,584	0,266	0,790	
FEMEDUNAT*LITORAL	0,284	0,471	0,603	0,547	
C	-3,851	0,438	-8,798	0,000	*

McFadden R-squared	0,1535	Mean dependent var	0,1050
S.D. dependent var	0,3066	S.E. of regression	0,2890
Akaike info criterion	0,5925	Sum squared resid	166,631
Schwarz criterion	0,6592	Log likelihood	-574,170
Hannan-Quinn criter.	0,6170	Restr. log likelihood	-678,258
LR statistic	208,1759	Avg. log likelihood	-0,2844
Prob(LR statistic)	0,0000		

Obs with Dep=0	1.807	Total obs	2.019
Obs with Dep=1	212		

Annex XI: Model to test Hypothesis 5 (3)

Dependent Variable: CALL
Method: ML - Binary Logit (Quadratic hill climbing)
Sample: 1 2020
Included observations: 2020
Convergence achieved after 6 iterations
QML (Huber/White) standard errors & covariance

Variable	Coefficient	Std. Error	z-Statistic	Prob.	
CONSUMER_GOODS	-0,059	0,556	-0,107	0,915	
COMMERCE	-1,295	0,416	-3,111	0,002	*
DISTRIBUTION	1,011	0,393	2,570	0,010	**
ELECTRONICS	-0,465	0,328	-1,419	0,156	
PHARMACEUTICS	-0,849	0,621	-1,366	0,172	
SERVICES	0,626	0,242	2,589	0,010	*
FINANCE_SERVICES	1,030	0,345	2,982	0,003	*
TELECOMUNICATIONS	0,290	0,541	0,536	0,592	
TYPE	0,156	0,211	0,740	0,459	
BET_0_10	0,151	0,629	0,240	0,810	
BET_11_50	-0,332	0,253	-1,311	0,190	
BET_51_250	-0,064	0,279	-0,228	0,820	
BET_251_500	-0,300	0,414	-0,725	0,469	
MANAGER	-0,866	0,458	-1,890	0,059	***
TECHNICIAN	-0,483	0,142	-3,405	0,001	*
GEN_ADM	1,669	0,544	3,065	0,002	*
FINANCE	0,702	0,260	2,704	0,007	*
HR	-0,745	0,770	-0,968	0,333	
LAW_PUB_REL	-0,056	0,770	-0,072	0,942	
MARKETING	1,420	0,250	5,687	0,000	*
SUBCONTRACT	0,310	0,181	1,712	0,087	***
FEMEDUNAT*LISBON	0,039	0,174	0,223	0,824	
FEMEDUNAT*OPORTO	0,192	0,411	0,467	0,641	
FEMEDUNAT*INTERIOR	0,174	0,525	0,332	0,740	
FEMEDUNAT*LITORAL	0,751	0,417	1,804	0,071	***
C	-2,794	0,324	-8,629	0,000	*

McFadden R-squared	0,1146	Mean dependent var	0,1441	
S.D. dependent var	0,3512	S.E. of regression	0,3332	
Akaike info criterion	0,7558	Sum squared resid	221,384	
Schwarz criterion	0,8280	Log likelihood	-737,323	
Hannan-Quinn criter.	0,7823	Restr. log likelihood	-832,775	
LR statistic	190,9039	Avg. log likelihood	-0,3650	
Prob(LR statistic)	0,0000			

Obs with Dep=0	1.729	Total obs	2.020
Obs with Dep=1	291		

Annex XIII: e.g. Application letters

Ex.mo(s) Senhor(s),

Face à recente oferta de emprego apresentada pela v/ organização, estou a enviar-vos a minha informação pessoal e profissional para análise.

Embora a minha actual ocupação profissional apresente um carácter essencialmente técnico, o meu perfil pessoal demonstra capacidades para a área comercial e de gestão. A facilidade de relacionamento e a ambição em atingir todos os objectivos que me são propostos, são algumas das minhas principais características.

Embora actualmente resida na Nazaré (local onde trabalho), sou natural da zona sul do país onde mantenho habitação (familiar). Tenho disponibilidade para fixar residência em qualquer ponto do país.

Fico a aguardar o v/ contacto para uma eventual entrevista, onde poderei explicitar as motivações com que me candidatei à v/ oferta.

Com os meus melhores cumprimentos.

R. M.

Annex XIIIV: e.g. Curricula Vitae

DADOS PESSOAIS

Nome   Renato Filipe Marques

Morada   R. Grupo Desportivo "Os Nazarenos" Lt 2 3ºEsq

                              2450-266 Nazaré

Telefone   927144807

Correio electrónico   marquesrenato@iol.pt

Nacionalidade   Portuguesa

Data de nascimento   09/11/1985

FORMAÇÃO ACADÉMICA

2008:

Master em Business Administration ministrado pela School of Business & Finance - London

2005:

Licenciatura em Finanças da Universidade de Aveiro – Média final de 14 valores.

Principais Cadeiras: Contabilidade; Finanças Empresarias; Analise Financeira;

Empreendedorismo.

EXPERIÊNCIA PROFISSIONAL

Desde 2009:

Colaboração com empresa local dedicada à Prestação de serviços de contabilidade e acessória financeira a empresas:

Recepção, organização e classificação de documentos;

Lançamento informático dos diversos movimentos contabilísticos;

Verificações, rectificações e encerramento de contas;

Processamento de salários.

De 2003 a 2005:

Delegado Comercial na empresa Paramédica – Equipamentos Médicos, Lda:

Gestão de uma carteira de clientes, prospecção de novos clientes, divulgação e demonstração de produtos.

OUTRAS INFORMAÇÕES

Domínio língua Inglesa;

Conhecimentos satisfatórios de Francês e Espanhol;

Bons conhecimentos de informática;

Inscrição na OTOC;

Viatura própria.