

# Gender and Academic Mobility

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**ABSTRACT.** What explains the gender gap in academic careers? This paper studies how geographic mobility constraints contribute to gender disparities in academic hiring, using novel administrative data covering the universe of PhD graduates in France (2009-2021) across all academic fields. I link individuals to the full set of job openings in their field to analyze job search behavior and the probability of obtaining a first academic job. First, I show that women apply to positions that are within a shorter distance, targeting universities near their PhD institution. Second, I leverage quasi-random variation in the geographic structure of the job market across fields and cohorts to show that when available jobs are farther away, applications and hiring fall, especially for women. Finally, I quantify the role of mobility constraints in the hiring gap: conditional on facing the same job market structure, women’s stronger sensitivity to distance lowers their probability of obtaining a first academic job in their first year of application by 1.71 percentage points relative to men, representing about 20% of the average hiring rate. Taken together, the findings highlight geographic mobility constraints as a meaningful and previously underexplored mechanism contributing to gender disparities in academic careers.

**Keywords:** Geographic Mobility, Academic Career, and Gender Inequality

**JEL:** I23, J16, J24

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# 1 Introduction

Women now account for nearly half of all PhD graduates in Europe and the United States. Yet they remain persistently underrepresented among university faculty (She Figures 2021; NSF, 2023). Understanding why women “leak” from the academic pipeline is central not only for equity but also for efficiency. Academic careers are among the most selective and skill-intensive in the labor market, and losing female talent represents a large cost for both scientific diversity<sup>1</sup> and society. Why do these gender gaps persist?

A large literature has explored why women progress more slowly through academic careers. On the demand side, studies document hiring discrimination (Bagues et al., 2017), recognition gaps in citation (Koffi, 2025) and peer evaluation (Sarsons, 2017; Card et al., 2022), and unequal access to professional networks (Ductor et al., 2023). On the supply side, women face hostile work environments (Dupas et al., Forthcoming; Wu, 2018), slower publication processes (Hengel, 2022), and strong family-related constraints (Kleven et al., 2019; Lassen and Ivandić, 2024).

However, this literature has underexplored an important feature of academic labor markets: the need for geographic mobility. Mobility is often a prerequisite of academic careers. In many countries, tenure-track positions are scarce and geographically dispersed, forcing early-career researchers to apply broadly and relocate, sometimes multiple times. Women may face higher mobility costs due to family ties, dual-career constraints, or preferences for proximity (Le Barbanchon et al., 2020). As a result, women may apply to positions that are within a shorter distance, reducing their job opportunities and therefore face a lower chance of obtaining a permanent academic position.

In this paper, I provide new evidence on how geographic mobility shapes gender differences in academic careers, using a unique combination of administrative, bibliometric, and geographic data covering the universe of PhD graduates in France and their job applications. I begin by documenting systematic gender differences in first-job search behavior: women apply to positions that are within a shorter distance, targeting universities near their PhD location. I then examine how these mobility constraints contribute to gender gaps in hiring. Using quasi-random variation in the average distance to job openings across fields and years, I show that women are more negatively affected by markets where openings are farther away. Finally, I use a back-of-the-envelope calculation to quantify how differences in distance sensitivity contribute to the gender gap in hiring.

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<sup>1</sup>Dossi (2024) shows that when smaller groups are underrepresented among researchers, this affects both the topics studied and the way research is conducted.

Studying how job search behavior shapes academic careers across fields is empirically challenging. In most countries, the academic labor market is decentralized, and existing studies typically observe hiring outcomes but not the full set of applications submitted by candidates. In contrast to other segments of the labor market - where job platforms or centralized registries sometimes capture application flows - academic systems rarely provide systematic information on where candidates apply or how geographically constrained their search is. The French institutional context offers a unique setting to overcome these challenges. Recruitment into permanent university positions follows a centralized and highly transparent process. After completing a PhD, candidates must first obtain a national qualification to become eligible to apply for permanent junior faculty positions (*Maître de Conférences*)<sup>2</sup>. Between the PhD and the first permanent job, candidates typically hold fixed-term academic positions, including postdoctoral fellowships and temporary teaching or research positions that are not observed in these data. Once qualified, candidates apply simultaneously to vacancies posted by universities across France, making geographic scope a key dimension of early-career search.

I construct a novel dataset that links three rich administrative sources: (i) the universe of doctoral theses defended in French universities (theses.fr); (ii) bibliometric data from Scopus, which I use to measure individual research productivity; and (iii) application and qualification records from the Conseil National des Universités (CNU), which track eligibility, applications, and recruitment outcomes between 2009 and 2021. The application data cover the universe of applications to standard permanent junior faculty openings in France; they exclude applications to foreign jobs and do not track exits from the French academic market. This dataset allows me to track candidates' application behavior and hiring in the French market for permanent junior faculty positions, link them to productivity, and characterize job search strategies in space. Because my analysis focuses on geographic mobility within the French academic labor market, I restrict the sample to individuals who obtained their PhD in France and received the national qualification required to apply for these jobs.

I proceed in two steps. In the first part of the paper, I examine gender differences in job search behavior using a dyadic design that links each PhD graduate to the full set of academic job openings in their field and year. I construct a candidate-job-level dataset to estimate how spatial distance affects the likelihood of applying to a given position and whether women are more sensitive to distance than men. This approach allows me to move beyond aggregate patterns and isolate how mobility constraints shape individual job search strategies, conditional on a rich set of fixed effects at the field,

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<sup>2</sup>Permanent entry-level university faculty positions in France, broadly comparable to associate professorships.

cohort, institutional, and individual levels. I find that candidates of both genders are less likely to apply to geographically distant positions, but that the effect is significantly stronger for women. These gendered distance effects are especially pronounced among older candidates and those with weaker publication records.

In the second part of the paper, I examine how mobility constraints contribute to gender gaps in hiring. While the first part documents gender gaps in application patterns, it remains unclear whether these gaps translate into lower success rates for women, or whether women apply more selectively but equally effectively. To address this, I leverage quasi-random variation in the average distance between candidates' PhD institutions and available job openings across fields and cohorts. Using this variation of geographic composition of opportunities candidates face, I show that candidates facing more distant openings are less likely to apply and less likely to secure a position overall (unconditional on applying). This effect is particularly pronounced for women, suggesting that mobility constraints play a role in shaping gender disparities in early academic placement.

To test whether these patterns reflect differences in employer behavior rather than candidate-side selection, I follow [Le Barbanchon et al. \(2020\)](#) and analyze hiring outcomes conditional on application. Using candidate-job-level data, I find that hiring probabilities decline with distance for both men and women. Although the marginal effect is slightly smaller for women, the difference is small and only marginally significant. This suggests that, conditional on applying, women are not penalized more than men based on geographic distance.

In the final part of the paper, I quantify the extent to which mobility constraints contribute to gender gaps in hiring. I use a back-of-the-envelope calculation based on reduced-form estimates and I find that, conditional on facing the same job market structure, women's stronger sensitivity to distance lowers their probability of securing a position by 1.71 percentage points relative to men, representing about 20% of the average hiring rate.

**Related Literature** This paper contributes to three strands of the literature on gender disparities in academic careers. A long-standing literature has documented women's persistent underrepresentation in academic careers, especially in STEM fields. [Ginther and Kahn \(2004\)](#) shows that women in economics face slower career progression, while [Ceci \(2011, 2014\)](#) and [Meyer et al. \(2015\)](#) emphasize both supply- and demand-side explanations. [Huang \(2020\)](#) provides cross-country evidence that gender disparities in scientific careers remain substantial despite near parity at entry. [Bisantis et al. \(2025\)](#) offers a comprehensive analysis of gender differences in post-PhD academic trajectories

using data on the full population of PhD graduates in France since 1988. They document persistent gaps in publication output across all fields and different stages of the academic career, even after controlling for discipline, cohort, and PhD institution, and estimate that nearly 5,000 women are “missing” from academic careers over 25 years. My contribution complements this work by zooming in on the initial transition from PhD to first permanent academic placement, identifying when and how women’s careers begin to diverge from men’s in a centralized and transparent academic system.

Several studies highlight disparities at specific stages of the academic career. [Bosquet et al. \(2019\)](#) shows that women are less likely to be promoted within French economics departments. [Sarsons \(2017\)](#) and [Card et al. \(2022\)](#) demonstrate gender gaps in recognition for co-authored work and peer evaluation, while [Gaule and Piacentini \(2018\)](#) and [Lerchenmueller and Sorenson \(2018\)](#) examine how advisors and early publication trajectories shape career outcomes. In France, [Corsini et al. \(2022\)](#) analyzes PhD students’ productivity, and [Patsali et al. \(2024\)](#) studies research independence. Other work has pointed to structural frictions: [Bagues et al. \(2017\)](#) documents hiring discrimination, [Ductor et al. \(2023\)](#) shows network disadvantages, [Hengel \(2022\)](#) highlights longer review times for female-authored papers, and [Wu \(2018\)](#) documents hostile work environments. My paper complements this literature by showing that gender gaps appear already at the transition into the first permanent job, with the final hiring stage accounting for most of the disadvantage.

A growing literature emphasizes the role of family responsibilities in shaping careers. [Kleven et al. \(2019\)](#) show that childbirth generates large and persistent earnings penalties; in academia, [Antecol et al. \(2018\)](#) find that parental leave policies affect tenure outcomes, and [Lassen and Ivandić \(2024\)](#) and [Galván and Tenenbaum \(2024\)](#) document long-run penalties to mothers’ careers. These family constraints are closely related to geographic mobility. [Le Barbanchon et al. \(2020\)](#) shows that women in the labor market often trade wages for shorter commutes. While their analysis focuses on private-sector workers in France, my paper draws a parallel with a different population: French PhD graduates navigating the academic labor market. Few studies provide systematic evidence on geographic mobility in academic job search. This paper is among the first to do so, showing that women apply to narrower and closer job sets, and that these mobility constraints help explain why women are less likely to secure permanent academic positions.

The remainder of this paper is organized as follows. Section 2 provides context on the French academic system. Section 3 describes the data sources and presents descriptive statistics. In Section 4, I document gender differences in application behavior and

mobility. Section 5 documents the impact of application intensity on hiring outcomes. Section 6 concludes.

## 2 Institutional Context: The French Academic Pipeline

This section provides the institutional background to understand the structure of academic careers in France and how individuals progress from PhD completion to permanent positions. I first describe the organization of the French academic system, including the main ranks and recruitment procedures. I then present the structure of the academic pipeline, which outlines the key transitions from PhD graduation to permanent employment. The final part of the section summarizes three empirical facts that motivate the next stage of the analysis.

### 2.1 The French Academic System

This section describes how the French academic system works and presents the main stages from the PhD to a permanent position. The French system is highly structured, with national rules that apply to all universities. This organization makes it an ideal setting to study academic careers and gender differences in access to permanent positions. I first describe the two main faculty ranks that define academic careers, and then outline the steps leading from PhD graduation to a permanent junior position.

#### Faculty ranks and structure

University teachers and researchers in France are civil servants. There are two main ranks: *Maître de Conférences* (MCF), a junior permanent position, and *Professeur des Universités* (PR), the senior rank. The MCF is the first tenured position in a university, comparable to an assistant professor. The PR rank comes later through promotion and is similar to a full professor. Both combine teaching and research duties, with national rules for pay scales and promotion. The MCF rank therefore, represents the main entry point into a permanent academic career. this paper focuses on the transitions leading to that position. For clarity, I will refer to MCF positions as *junior permanent positions* throughout the paper.

#### From PhD to national qualification

After completing a PhD, candidates who wish to pursue an academic career must obtain a national *qualification* delivered by the National Council of the Universities (*Conseil*

*National des Universités* - CNU)<sup>3</sup>. This step confirms that the person is eligible to apply for junior permanent positions. Applications are submitted online and include a CV, a list of publications, teaching experience, and other academic activities. The CNU dossier requires evidence of research activity (e.g., working papers, manuscripts, conference papers, or publications). Candidates apply for qualification either in the months around the PhD defense or in the subsequent years, while holding fixed-term academic positions (postdoctoral fellowships and teaching or research contracts). Because the application records begin at the qualification stage, I do not observe candidates' intermediate positions prior to qualification. Each discipline has its own CNU committee that reviews applications. The qualification is valid for four years, and candidates may apply in more than one disciplinary section (see Table B10 in the Appendix for an overview). Success rates range between 70 and 90% in most fields,<sup>4</sup> suggesting that this stage is not very selective.

### **From qualification to MCF recruitment**

Once qualified, candidates can apply for junior permanent positions through the national online platform *Galaxie*<sup>5</sup>. All openings are published at the same time each spring, and candidates may apply to several universities. Each university establishes a selection committee composed of both internal and external members. Committees review applications, shortlist candidates, and conduct interviews. The process, therefore, combines national coordination with local autonomy. Junior permanent positions offer civil servant status, teaching obligations of 192 hours per year, research independence within a department, and job security. Promotion opportunities and salary progressions are uniform across universities, which limits within-rank inequality and facilitates comparisons across disciplines. Half qualified never apply on the platform *Galaxie*, reflecting exits from the French academic job market or applications to jobs outside the scope of my records (e.g., abroad or other tracks).

### **Beyond the junior rank: Promotion and senior ranks**

This paper focuses on the early stages of an academic career, up to the first permanent position. Later in the career, promotion to the senior rank, *Professeur des Universités* (PR), requires an additional qualification called the *Habilitation à Diriger des Recherches* (HDR). The HDR certifies that a researcher can supervise PhD students and lead

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<sup>3</sup>In rare cases, individuals from abroad may apply for university positions without the qualification, but this exception is uncommon. In practice, the qualification is almost always required to access junior permanent positions.

<sup>4</sup>The rate is around 50% in Law and Political Science due to a more restrictive selection policy.

<sup>5</sup>Starting spring 2026, the platform will change, now called *Odyssée*.



research projects. Promotion to a senior position follows a process similar to the earlier qualification and recruitment stages, with some institutional changes introduced in 2018. [Bosquet et al. \(2019\)](#) studies gender differences in the transition from junior to senior positions within the French academic system in Economics.

### Alternative research careers in France

Some researchers in France work in national research organizations such as the *Centre National de la Recherche Scientifique* (CNRS). These positions focus mainly on research and usually do not include teaching. They are fewer in number and very competitive, but they offer an alternative to university careers<sup>6</sup>.

## 2.2 French Academic Pipeline

This section describes the main stages of the French academic pipeline, from PhD completion to securing a permanent position (see Figure 1). The pipeline is structured around four key transition points that determine career progression and can be divided into two main stages.

*Stage 1* covers the period from PhD graduation to obtaining the national qualification, which is required to apply for permanent junior positions. This stage includes two steps: (a) the decision to apply for the qualification and (b) the success of that application. *Stage 2* runs from qualification to securing a junior permanent position. It also includes two steps: (a) applying for a permanent position and (b) the outcome of the recruitment process.

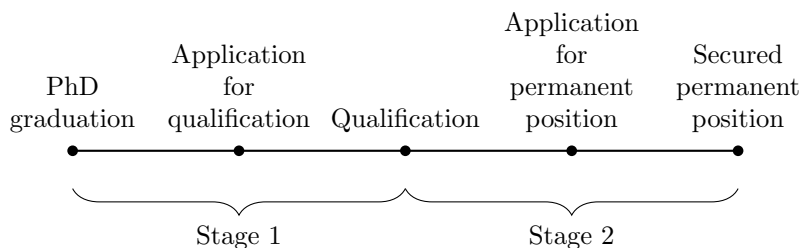


Figure 1: Key transition points

To analyze gender gaps at each transition stage of the academic pipeline, I rely on results developed in a companion paper [Bisantis \(2025\)](#). That work separates the overall probability of securing a permanent position into two components: (1) the probability of

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<sup>6</sup>In Economics and related fields, some institutions have also introduced tenure-track *Assistant Professor* positions that lead to a tenured post equivalent to the senior permanent rank, *Professeur des Universités*.



obtaining the national qualification, and (2) the probability of being hired into a junior permanent position once qualified. I briefly summarize the main findings here in Facts 1 and 2 to motivate the analysis of underlying mechanisms. The method is detailed in Section C.1 in Appendix.

**Fact 1: There is a gender gap in access to permanent academic positions**

Bisantis (2025) documents systematic gender differences in academic career progression. Across all fields, women are less likely than men to obtain a junior permanent position after completing their PhD. This disadvantage appears at multiple stages of the pipeline but is especially pronounced in the transition from qualification to recruitment into junior permanent positions. In Table A, columns (5) and (6) show that, in our sample, after controlling for individual characteristics and field-university-year fixed effects, women are about 0.5 percentage points less likely to secure such positions. Given a baseline success rate of 8.6% (column 4), this represents a 6% relative gap.

**Fact 2: The gap is driven by application behavior rather than success once applying**

Using the decomposition approach, Bisantis (2025) quantifies how each transition contributes to the overall gender gap. The analysis shows that the main source of this gap lies in application behavior rather than in selection once candidates apply: Women and men have similar success rates conditional on applying, but women are less likely to submit applications for junior permanent positions. This finding motivates the next section, where I investigate one possible mechanism behind these application differences: geographic mobility.

### 3 Data

I built a novel dataset that links all PhD graduates in France to their research output, application behavior, and hiring outcomes in academia. This rich administrative data allows me to track candidates from PhD graduation to permanent junior faculty positions, observing both the universe of job offers and actual applications. I structure the data at the candidate-job level to analyze how mobility constraints shape application and hiring decisions. This section describes the data sources, variable definitions, and summary statistics. Summary statistics are reported in Table A1.

### 3.1 Sources

This study combines three main data sources to construct comprehensive academic career trajectories of PhD graduates in France: I retrieved data from (i) *Theses.fr* on all PhD theses defended in French universities from 2000 to 2021. For each PhD thesis, I have information on the discipline of study, defense year, university affiliation, and first and last name of the PhD graduate and the supervisor(s). *Theses.fr* is a centralized public platform with mandatory reporting from universities, making it a comprehensive and reliable source despite minor spelling inconsistencies and occasional delays. I infer supervisor gender using standard first-name-based classification methods, identifying gender for 95% of supervisors. I use (ii) *Scopus* to measure research productivity. I extract bibliometric data on all publications up to 2021, using full-name matching for both graduates and supervisors. This includes metadata on publication titles, journal names, year, number of co-authors, institutional affiliations, and the Article Influence Score (AIS)<sup>7</sup>. I use (iii) *CNU Database* from The Conseil National des Universités dataset, which provides a comprehensive record of acceptance and rejection decisions for researchers seeking qualifications. It includes information on birth date, age, name, gender, and discipline associated with a candidate number. Using this candidate number, I track all applications to junior permanent positions and observe the selected candidate for each job.

### 3.2 Candidate-Job Dyad Construction

This study relies on a dyadic dataset that links each PhD graduate qualified to the universe of job openings for junior permanent positions in the French academic market in their discipline across institutions and years. The unit of observation is a dyad between a candidate and a potential job opening within the same academic field. To avoid selection bias, I restrict attention to the first year of job market participation.

Dyads are constructed by matching each PhD graduate to all job openings posted in their discipline during the relevant year. This approach reflects the actual opportunity set faced by candidates, as application rules and disciplinary boundaries limit cross-field mobility. Each dyad is associated with characteristics of the candidate, the job opening, and the hiring institution - including geographical distance between the PhD institution and the job-posting institution.

From this dyadic dataset, I construct an individual-level panel by aggregating across dyads. I exclude job postings in overseas territories (DOM-TOM) except Corsica and drop graduates or applications associated with those regions (representing 3% of the

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<sup>7</sup>AIS is a journal-level metric commonly used to measure publication quality; see [Bagues et al. \(2017\)](#).

sample).

The final sample comprises approximately 2,287,593 dyads, constructed from 43,966 qualified PhD graduates and 18,787 job offers across 58 sub-disciplines, spanning the period from 2009 to 2021.

### 3.3 Main Variables

**Outcomes** For each dyad, I observe two main outcomes: *Apply* takes the value 1 if the candidate applied for the position, and 0 otherwise. This outcome is used to analyze revealed preferences over job openings. *Success* takes the value 1 if the candidate was selected for the position, and 0 otherwise. This variable captures hiring outcomes.

**Controls** The vector of controls is a function of age at the year of application and its square; whether individual  $i$  has at least one scientific publication appearing in the *Scopus platform* (dummy  $Publish_{it}$ ); the cumulative number of publications at year  $t$  ( $Quantity_{it}$ ) and the cumulative Article Influence Score (AIS) of publications at year  $t$  ( $Quality_{it}$ ), and supervisor characteristics including whether at least one supervisor is female ( $Female\_supervisor$ ) and the cumulative AIS score of supervisors at the year of PhD defense of individual  $i$  ( $Quality\_supervisor_i$ ). All controls are listed in Table A1.

**Distance** The main geographic variable is the great-circle (orthodromic) distance between the city of the PhD-granting institution and the city of the hiring institution, measured in kilometers. I compute this distance “à vol d’oiseau” using geo-coordinates (latitude and longitude), following the Vincenty ellipsoid formula. This measure reflects true geographic separation, abstracting from travel infrastructure. To account for spatial variation in large urban areas and to improve precision in cases where both institutions are located in the same city, I follow the approach of Mayer and Zignago (2011) by incorporating the radius of the city. The city radius provides an estimate of the geographical size of each urban area and helps differentiate between genuinely proximate institutions and those that may be several kilometers apart within the same city.<sup>8</sup> The use of distance from the PhD institution as a measure of spatial frictions is motivated by the concept of *home bias* - the well-documented tendency for individuals to remain near familiar or previously inhabited locations<sup>9</sup>. While I do not observe

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<sup>8</sup>I use INSEE data to obtain the official surface area of each city and compute the radius assuming circular symmetry. Geo-coordinates (longitude and latitude) for each city are also retrieved from INSEE. I compute great-circle distances between cities using the *GEODIST* function in Stata based on these coordinates.

<sup>9</sup>The concept of *home bias* originates in international finance, where it describes the preference for domestic over foreign assets. It is now commonly used in labor and migration contexts to capture individuals’ tendency to remain near familiar or previously inhabited locations.

candidates’ place of birth, the PhD institution serves as a reasonable proxy for “home” for several reasons: (1) Many candidates complete both their Master’s and PhD at the same institution,<sup>10</sup>; (2) The PhD period often coincides with long-term personal and professional settlement; (3) Application patterns in the data show strong spatial concentration around the PhD institution - for instance, one quarter of applications are submitted within the same region. This interpretation is consistent with recent literature documenting geographic immobility and local labor market attachment: prior residence and institutional affiliation are shown to influence job search behavior (Kleven et al., 2020; Diamond, 2016).

## 3.4 Descriptive Statistics

### 3.4.1 Candidates

Table A1 presents descriptive statistics for the sample of qualified candidates, disaggregated by gender. Women represent 44% of the sample, are slightly older than men on average (34 vs. 33 years), and have spent a similar amount of time since completing their PhD (3 years).

Male candidates are more likely to have at least one publication (64% vs. 49%), publish more (5 vs. 3), and have higher cumulative journal impact scores (AIS: 6 vs. 3). These differences are consistent with the literature on gender gaps in research productivity<sup>11</sup>. Both groups apply to a similar number of positions (3.5 applications), and the probability of securing a position is identical across genders at 9%.

Some of these differences likely reflect disciplinary composition rather than gender per se. Women are more represented in Humanities (31% vs. 18%) and Literature (12% vs. 5%), while men dominate Engineering (13% vs. 6%), Physical Sciences (15% vs. 7%), Mathematics (8% vs. 3%), and Computer Science (11% vs. 4%).

Field-level statistics (Tables B6-B9) show that gender gaps in research productivity and application behavior persist within-but vary across-fields. In STEM, men publish more and apply slightly more; in Humanities, women apply more but publish slightly less. In Biological and Social Sciences, gender differences are minimal. Age also varies considerably across fields: candidates in Humanities and Social Sciences are older on average than those in STEM or Biological Sciences, which likely contributes to the small overall gender difference in age, given women’s greater representation in those older fields.

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<sup>10</sup>In France, Master’s programs include research-oriented tracks that often serve as a direct pipeline to a PhD at the same university.

<sup>11</sup>(Holman et al., 2018; Xie and Shauman, 2003; Larivière et al., 2013; Bisantis et al., 2025)

While the magnitude and direction of gender gaps are not uniform across fields, men tend to have higher research output on average, particularly in fields with greater overall publication intensity. These patterns indicate that differences in field composition alone are insufficient to explain all observed gender disparities, reinforcing the importance of including field fixed effects in the empirical analysis.

**Successful Candidates.** Table B5 presents descriptive statistics for candidates who secured a permanent position. Women account for 42% of this group. Among successful applicants, men continue to show higher research output, with more publications (4 vs. 2) and higher cumulative AIS scores (3.25 vs. 1.59). To secure the position, women applied to slightly more positions on average (12 vs. 11) and are, on average, marginally older (32 vs. 33 years). Gender differences in field representation persist: women remain more concentrated in Humanities, Literature, and Management, while men are more represented in Engineering, Computer Science, and Physical Sciences.

**Location** Figure A1 displays the cumulative number of qualified candidates from 2009 to 2021 by *department*<sup>12</sup>, based on the location of their PhD institution. The spatial distribution is highly unequal across France. A small number of departments concentrate the majority of qualified candidates. Paris alone accounts for over 14,500 qualifiers, representing nearly 30% of the national total. Other prominent academic hubs include Rhône (Lyon, 2,612), Haute-Garonne (Toulouse, 2,479), Isère (Grenoble, 1,897), Bouches-du-Rhône (Marseille, 1,995), and Hérault (Montpellier, 1,655). In contrast, more than 40 departments recorded fewer than 100 qualifiers, and over 30 produced none at all during the entire period.

Figure A2 shows the evolution of the number of qualified candidates per department between 2009 and 2021. The left y-axis plots the annual counts for each department (excluding Paris), while the right y-axis displays the national totals. Two versions of the total are shown: a solid line represents the sum excluding Paris, and a dashed line includes Paris. This distinction is necessary because Paris is a strong outlier and would otherwise obscure variation across other departments. The Figure highlights a clear national decline in the number of qualified candidates starting around 2014. Most departments follow a downward trajectory, though the decline is numerically driven by the largest academic centers-particularly Paris and other major university cities.

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<sup>12</sup>Departments (départements) are French administrative divisions, akin to counties, and serve as a geographic unit in the analysis.

### 3.4.2 Job Offer

**Location.** Figure A3 shows the cumulative number of permanent academic job openings by *department* between 2009 and 2021, based on the location of the hiring institution. The spatial distribution broadly overlaps with the training locations of qualified candidates, but job openings are overall less concentrated. The department of Paris again dominates with over 4,500 positions, followed by Rhône (1,058), Haute-Garonne (892), Bouches-du-Rhône (749), and Isère (647). However, many other departments offer relatively few jobs: over 30 departments recorded fewer than 100 positions during the entire period, and more than 20 had none at all.

Figure A4 displays the annual number of permanent academic job offers by department between 2009 and 2021. Department-level trends are plotted on the left y-axis, excluding Paris for readability. The right y-axis shows two national totals: the solid line excludes Paris, while the dashed line includes it. As in the case of qualified candidates, the number of job openings has declined significantly since 2014. However, the contraction in job supply is even more pronounced, with a steeper and more sustained decline. This reflects broader institutional constraints on recruitment and shrinking opportunities.

Figure B8 and Figure B7 document the evolution of both supply and demand in the French academic job market from 2009 to 2021. The number of available junior positions has declined steadily since 2012, across nearly all disciplines. This contraction has been met with relatively stable or increasing numbers of qualified candidates, suggesting a tightening of the market over time. Disciplines such as Humanities consistently offer the largest number of positions, but they also encompass a broader range of subfields (see Table B10 in the Appendix).

## 4 Gender gap in application behavior

### 4.1 Results: Dyad Approach to Application Behavior

To estimate how spatial frictions shape job search behavior, I examine the probability that a qualified PhD graduate applies to a given junior permanent position. The unit of observation is a dyad between candidate  $i$  and job opening  $j$  in discipline  $f$  during year  $t$ . The sample is restricted to the initial year of job market entry and to job openings within the candidate’s discipline of qualification. I estimate the following linear probability model:

$$Y_{ijt} = \beta_1 \ln(\text{Distance}_{ij}) + \beta_2 \text{Female}_i + \beta_3 \ln(\text{Distance}_{ij}) \times \text{Female}_i + X'_{ijt} \gamma + FE + \varepsilon_{ijt} \quad (1)$$

The dependent variable is a binary indicator equal to one if candidate  $i$  applied to position  $j$ . The key independent variable is the log of the great-circle distance (in kilometers) between the PhD institution and the hiring institution. I interact  $\ln(\text{distance})_{ij}$  with a gender dummy to test whether female candidates are more sensitive to spatial frictions. The vector  $X_{ijt}$  includes controls for candidate age, publication record, and supervisor characteristics. Fixed effects  $FE$  varies across specifications.

Table 1: Determinants of Application Behavior: Candidate-Job Dyads

|   | (1)   | (2)                                | (3)   |
|---|---|------------------------------------|---|
| Dependent variable:                         | <i>Apply to position</i>                        |                                    |   |
| Female                                      | 0.00711**<br>(0.00280)                          | 0.000635<br>(0.00324)              | -<br>-  |
| $\ln(\text{Distance})$                      | -0.0127***<br>(0.000319)                        | -<br>-                             | -0.0127***<br>(0.000304)                        |
| $\ln(\text{Distance}) \times \text{Female}$ | -0.00238***<br>(0.000440)                       | -0.00116**<br>(0.000534)           | -0.00235***<br>(0.000398)                       |
| Adj $R^2$                                   | 0.19  | 0.19                               | 0.30  |
| Controls                                    | yes   | yes                                | yes   |
| Fixed effects                               | $U_i \times t \times f + U_j \times t \times f$ | $U_i \times U_j \times t \times f$ | $i \times (t \times f) + j \times (t \times f)$ |
| Observations                                | 2,287,422                                       | 2,162,136                          | 2,286,953                                       |

Notes: *Apply* is a binary variable equal to 1 if the candidate applied to a specific job. Each observation represents a dyad between a candidate and a potential job opening.  $\ln(\text{Distance})$  is the logarithm of the geographical distance between the job and the candidate's PhD institution. All regressions include controls for age, publication metrics, and supervisor gender. Fixed effects vary across specifications and are indicated in the "Fixed effects" row:  $U_i$  denotes the university of candidate  $i$ ,  $U_j$  the university of the job  $j$ ,  $t$  the year, and  $f$  the field.  $i$  and  $j$  denote candidate and job identifiers, respectively. Standard errors are clustered by Discipline  $\times$  Candidate Univ  $\times$  Year. Significance levels are defined as follows: \*  $p < 0.10$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$ .

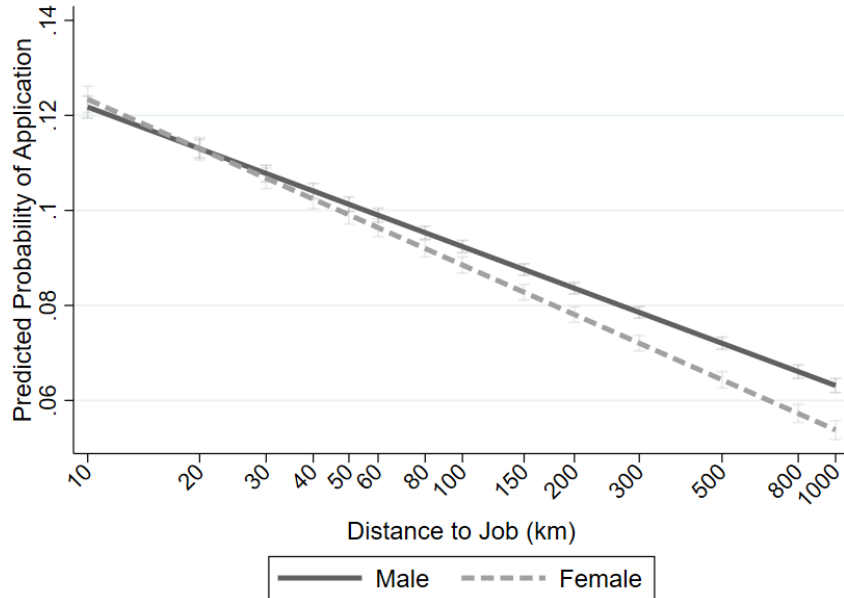
Table 1 presents the estimation results. Across all specifications, the interaction between distance and gender is negative and statistically significant, indicating that female candidates are more geographically constrained in their application behavior.

In Column (1), the specification includes university-by-year-by-field fixed effects for both the candidate's PhD institution ( $U_i \times t \times f$ ) and the job institution ( $U_j \times t \times f$ ). This specification compares candidates from the same university and discipline applying in the same year, and jobs posted by the same hiring institution and discipline in the same year. The coefficient on  $\ln(\text{Distance}_{ij})$  therefore captures how variation in distance across dyads - holding constant institutional characteristics - predicts application decisions.



The coefficient on  $\ln(\text{Distance}_{ij})$  is  $-0.0127$ , implying that a 10% increase in distance reduces the probability of application by about 0.13 percentage points. The interaction term is negative and significant ( $-0.00238$ ), suggesting that this spatial sensitivity is amplified for women. The combined effect of distance for female candidates is  $-0.0151$ , nearly 20% larger in magnitude compared to men. Figure 2 illustrates this result: the probability of applying declines with distance for both genders, but the slope is notably steeper for women. In Appendix Figures A5 and A6, I show non-parametric binscatters that flexibly depict the same pattern. These reveal that women are particularly less likely to apply beyond 200km, and the gap persists across specifications with richer fixed effects.

Figure 2: Predicted Number of Applications by Distance to Job Offers by Gender



*Notes:* Predicted probability of applying to a job as a function of distance from the candidate’s PhD institution, shown separately by gender. Estimates are based on the regression model in column (1) of Table 1 and control for age, publication metrics, supervisor characteristics, and fixed effects. Distance (x-axis) is plotted on the original kilometer scale for interpretability. Standard errors are clustered by Discipline X Candidate Univ X Year.

Column (2) introduces dyadic fixed effects at the candidate university-job university-year-field level  $U_i \times U_j \times t \times f$ . This specification compares candidates from the same PhD institution applying to jobs at the same hiring institution, within the same discipline and year. The main effect of distance is absorbed, but the interaction term remains negative and statistically significant ( $-0.00116$ ), confirming that gendered distance effects persist even within narrowly defined institutional pairs.

Column (3) includes individual-level fixed effects for both candidates and jobs, interacted with year and field ( $i \times (t \times f) + j \times (t \times f)$ ). This approach compares which

jobs a given candidate applies to, and which candidates apply to a given job, within the same field and year. By absorbing all individual and job-level characteristics - both observed and unobserved - that are constant within the year-field cell, this specification sharpens identification by leveraging only within-candidate variation in job opportunities. The remaining variation in distance captures differential application patterns across jobs faced by the same candidate. The distance coefficient remains negative and highly significant ( $-0.0127$ ), and the interaction term remains robust ( $-0.00235$ ). Even when comparing the same candidate across alternative jobs, and the same job across alternative candidates, women remain less likely to apply to geographically distant positions.

## 4.2 Robustness: Dyad Approach to Application Behavior

The results are robust to a range of alternative specifications. First, Table D16 replaces the logarithmic transformation of distance with the level measure (in kilometers). The interaction between gender and distance remains negative and significant across specifications, confirming that the log-linear form is not driving the result.

Second, I construct a new measure of geographic frictions based on estimated commuting time between the PhD and job location. This variable combines train travel time (from official SNCF timetables), road travel time (based on routing algorithms), and AI-based predictions for less connected pairs. Details of the construction are provided in Appendix Section C.3. As shown in Table D17, the interaction between gender and commuting time remains negative and significant.

Third, I include controls for age at PhD and time since graduation to account for potential differences in life-cycle stage (Table D18). The estimates are unchanged, suggesting that career timing is not a confounding factor.

Fourth, to assess whether the effect is driven by spatial clustering in the Paris region - where job opportunities are dense - Table D19 excludes candidates located in Paris. The gender-distance interaction remains robust, indicating that local agglomeration is not driving the main result.

Fifth, I account for potential selection based on the decision to apply at all. Table D20 presents estimates for several restricted subsamples. Panel A focuses on candidates who applied to at least one job during their entire career, while Panel B restricts further to those who submitted at least one application in their first year of eligibility.

## 4.3 Heterogeneity in Dyad-Level Results

To better understand the mechanisms underlying this gendered spatial constraint, I next examine how the distance penalty varies across key dimensions of candidate heterogeneity.

Table [D22](#) explores heterogeneity in the gender-distance interaction by candidate age, time since PhD, academic productivity.

**Age and Career Stage.** Panels A and B split the sample by the median candidate age at application and years since PhD, respectively. The gender-distance interaction is negative and statistically significant in both younger and older groups, but the magnitude is larger among older candidates and those who are further from graduation. For example, among those with above-median time since PhD, the interaction term is  $-0.00288$  compared to  $-0.00150$  for newer graduates

**Research Productivity** Panels C and D examine heterogeneity by candidates' academic productivity, measured by AIS (Article Influence Score) and number of publications. The gender-distance gap is significant regardless of research output, but larger among those without any publications. For instance, women with no publications face a higher distance penalty ( $-0.00207$ ) than their male peers, while those with publications still show a significant, but smaller, gap.

**After First Year of Qualification.** Panels C to E of Table [D20](#) examine how the gender-distance interaction evolves over time by estimating the model separately for candidates still on the job market in their second, third, and fourth years after PhD qualification. While the main analysis focuses on first-year applicants to avoid selection bias from lower-performing candidates who remain on the market longer, this extended analysis allows me to assess whether gendered spatial frictions persist beyond initial market entry. Across all subsequent years, the gender-distance interaction remains negative and statistically significant, though its magnitude gradually declines. This suggests that spatial constraints are most binding for women at the start of their academic careers, but continue to shape application behavior even in later years.

**Heterogeneity by Fields** Finally, Table [D21](#) explores whether the gender-distance interaction varies across broad disciplinary categories. The interaction is negative and statistically significant in STEM (Panel C) and Social Sciences (Panel D), where job markets are more dispersed and geographic mobility expectations higher. In contrast, the coefficients are smaller and not statistically significant in Biology and Humanities (Panels A and B), possibly due to tighter geographic clustering of job postings and smaller sample sizes. These differences point to important field-specific variation in how spatial constraints manifest across the academic labor market.

## 4.4 Results: Individual-level Application Behavior

To complement the dyadic analysis, I examine gender differences in the number of applications submitted, distinguishing between nearby (within 100 km) and distant (over 100 km) job opportunities. The goal is to test whether the responsiveness to local versus distant job market conditions varies by gender. I estimate Equation (2), where the outcome is the log number of applications (plus one) submitted by each candidate to jobs in either distance *type*:

$$Y_{it}^{type} = \beta_1 Female_i + \beta_2 Offers_{tf}^{type} + \beta_3 Female_i \times Offers_{tf}^{type} + X_i' \gamma + \delta_{tf} + \mu_{u(i)f} + \varepsilon_{it} \quad (2)$$

where  $Y_{it}$  denotes the number of applications that candidate  $i$  submits in year  $t$  to jobs of type *type* (either nearby or distant). The term  $Offers_{tf}^{type}$  captures the number of job openings available in field  $f$  and year  $t$  for each category of distance (either under 100km or over 100km). The interaction term tests whether the responsiveness to job market thickness differs by gender. The vector  $X_i$  includes candidate-level controls for age, publication record, supervisor productivity, and supervisor gender. The model includes fixed effects for field-by-year ( $\delta_{tf}$ ) and for PhD institution-by-field ( $\mu_{u(i)f}$ ), thereby accounting for both time-varying discipline-specific shocks and institutional heterogeneity in PhD institution.

Table 2: Gender Differences in Application Patterns by Distance to Job Offers

| Dependent variable:         | Applications to Nearby Jobs ( $\leq 100km$ ) |                          |                         | Applications to Distant Jobs ( $>100km$ ) |                         |                         |
|-----------------------------|--|--------------------------|-------------------------|---|-------------------------|-------------------------|
|                             | (1)  | (2)                      | (3)                     | (4)                                       | (5)                     | (6)                     |
|                             | $\ln(near\ apps + 1)$                        | $\ln(near\ apps + 1)$    | $\ln(near\ apps + 1)$   | $\ln(far\ apps + 1)$                      | $\ln(far\ apps + 1)$    | $\ln(far\ apps + 1)$    |
| Female                      | -0.0212***<br>(0.00403)                      | -0.0231***<br>(0.00404)  | -0.00912**<br>(0.00413) | -0.0267***<br>(0.00870)                   | -0.0334***<br>(0.00870) | -0.0319***<br>(0.00900) |
| Near offers                 | 0.0280***<br>(0.000789)                      | 0.0281***<br>(0.000791)  | 0.0300***<br>(0.00124)  |   |                         |                         |
| Female $\times$ Near offers | 0.00453***<br>(0.000968)                     | 0.00460***<br>(0.000966) | 0.00132<br>(0.00101)    |   |                         |                         |
| Far offers                  |  |                          |                         | 0.0172***<br>(0.000736)                   | 0.0170***<br>(0.000733) | 0.0106***<br>(0.00155)  |
| Female $\times$ Far offers  |  |                          |                         | -0.000145<br>(0.000352)                   | -0.000137<br>(0.000350) | -0.000276<br>(0.000358) |
| Adj $R^2$                   | 0.33   | 0.33                     | 0.38                    | 0.32                                      | 0.33                    | 0.35                    |
| Controls                    |  | yes                      | yes                     |   | yes                     | yes                     |
| Fields X Year FE            | yes  | yes                      | yes                     | yes                                       | yes                     | yes                     |
| Fields X Univ PhD FE        |  |                          | yes                     |   |                         | yes                     |
| Observations                | 68258  | 68258                    | 67617                   | 68258                                     | 68258                   | 67617                   |

*Notes:* The dependent variable is the natural logarithm of the number of applications plus one, submitted by candidates, separately for nearby job offers (within 100km) and distant job offers (over 100km). Control variables include age, publication metrics, supervisor gender, and supervisor productivity. Standard errors are clustered by Discipline X Candidate Univ X Year. Significance levels are defined as follows: \*  $p < 0.10$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$ .

Table 2 reports the results. Columns (1)-(3) focus on applications to nearby jobs. Across all specifications, women submit fewer local applications than men: the female coefficient is negative and statistically significant, ranging from  $-0.021$  to  $-0.009$ . This implies that, conditional on observables, women submit about 1-2% fewer local applications on average. However, the gap becomes smaller and loses significance in column (3), which includes PhD institution fixed effects, suggesting that institutional sorting partly explains the difference.

Importantly, the interaction term between Female and Near Offers is positive and significant in columns (1) and (2), indicating that women are more responsive to increases in the number of local job openings. In other words, women apply less overall, but are more elastic to local market conditions. From columns (4) and (6), the gender gap is more pronounced and robust: women submit significantly fewer distant applications across all specifications (around  $-0.03$ ), and the Female  $\times$  Far Offers interaction is small and statistically insignificant. This suggests that female candidates are less responsive to increases in distant job availability, consistent with greater mobility constraints.

Overall, these individual-level results reinforce the findings from the dyadic analysis. Female candidates apply to fewer jobs overall, and this gap is especially salient for distant positions. Moreover, women exhibit greater responsiveness to variation in nearby job openings but not to distant ones. These patterns support the interpretation that spatial frictions are more binding for female candidates, leading to differential application behavior even after controlling for research productivity, supervisor quality, and field-level opportunity structures.

## 4.5 Robustness Checks: Individual-level Results

Table D23 re-estimates the Table 1 using Poisson Pseudo-Maximum Likelihood (PPML) rather than log-linear models. The estimates remain stable in magnitude and direction, confirming that the findings are not driven by functional form assumptions.

In Tables D25-D28 I implement the same robustness checks symmetric to those shown in Table D16 to D21. Results remain consistent throughout and are in line with the patterns observed of the dyadic approach.

Table D28 examines heterogeneity across disciplines. While the interaction between gender and geographic distance is consistently negative and significant in the pooled regressions, the coefficients are not statistically significant within individual disciplines. This likely reflects a combination of reduced statistical power and potential heterogeneity across fields. Importantly, the point estimates are generally in the same direction across disciplines, suggesting that the absence of significance may not reflect an absence of effect.

Finally, Table D29 uses alternative measures of geographic proximity, redefining “local” markets at the city and region level, respectively. The interaction between gender and local job density remains positive and significant in both cases, further supporting the interpretation that women are more sensitive to spatial constraints in their application behavior.

Taken together, these results provide robust evidence that spatial distance significantly discourages job applications, and that this deterrent effect is stronger for women. Gendered spatial constraints in the job search process persist even after conditioning on academic productivity, career stage, supervisor characteristics, and fixed effects at the candidate, job, institutional, and field level.

## 5 From Applications to Securing a Junior Permanent Position

The previous section documented significant gender differences in application behavior, especially in response to geographic distance. But applying is only the first step in the academic job market. This section investigates how application behavior translates into hiring outcomes: are men and women equally likely to secure a position, conditional on how many jobs they apply to? And to what extent does the spatial structure of the job market shape these outcomes?

### 5.1 Geographic Market Structure: Average Distance of Job Offers

**Job Offer Average Distance Index.** To capture spatial constraints in the academic job market, I construct a measure of the Average Distance between a candidate’s PhD institution and the universe of job openings available in their field and year of application. Formally, the average distance for candidate  $i$  in field  $f$  and year  $t$  is defined as:

$$\text{Av. Distance}_{ijft} = \frac{\sum_j \text{Distance}_{ij}}{\sum_j N_{ft}}, \quad (3)$$

where  $\text{Distance}_{ij}$  is the great-circle distance between candidate  $i$ ’s PhD institution and each job posting  $j$  in their field and year, and  $N_{ft}$  is the total number of such positions. Intuitively, a higher value reflects a more spatially dispersed job market.

The Average Distance variable is defined at the field-year level and captures variation in the geographic structure of the job market that is plausibly exogenous to individual candidates’ preferences, qualifications, or strategies. In the French academic system,

job openings are announced centrally and only after candidates complete their PhD and obtain the national qualification. As a result, candidates cannot anticipate the geographic configuration of the market they face in their year of entry.

This structure introduces idiosyncratic, quasi-random variation across cohorts and disciplines in how geographically distant the available jobs are. These exogenous differences affect all candidates within a field-year but may have differential consequences across subgroups, such as men and women. In particular, if some candidates are more sensitive to geographic constraints than others, variation in average distance can translate into differences in the number of applications submitted and, ultimately, in hiring success.

Because this variation operates at the individual level, it allows for a credible analysis of how job market geography affects application behavior and the probability of securing a position.

## 5.2 Estimation Model

To investigate how application behavior relates to hiring outcomes, I estimate a series of OLS regressions at the candidate level. The dependent variable in all regressions is a binary indicator equal to 1 if a candidate secures a junior permanent academic position.

The main explanatory variable is the number of applications submitted, measured as  $\ln(\text{Apps} + 1)$ . This variable captures application intensity: candidates who apply to more jobs may be more likely to succeed, either because of greater effort or better qualifications.

To explore gender differences, I include a dummy variable for women and interact it with application intensity. This allows the effect of applying to vary by gender.

In addition, I examine how spatial constraints affect both application behavior and hiring outcomes. I focus on the *Average Distance*, defined as the average great-circle distance between a candidate's PhD institution and all job openings in their field and year of first qualification. A more dispersed market may reduce the number of applications and lower the chances of being hired, especially for women.

### Model 1: Applications and Hiring

$$\text{Success}_i = \beta_0 + \beta_1 \ln(\text{Apps}_i + 1) + \beta_2 \text{Female}_i + \beta_3 \text{Female}_i \times \ln(\text{Apps}_i + 1) + X_i' \gamma + \delta_{ft} + \delta_{uf} + \varepsilon_i \quad (4)$$

This regression estimates the relationship between the number of applications and the probability of securing a job. It also tests whether this relationship differs for men and women.



## Model 2: Applications and Distance

$$\ln(\text{Apps}_i + 1) = \pi_0 + \pi_1 \text{AvgDistance}_{ft} + \pi_2 \text{Female}_i \times \text{AvgDistance}_{ft} + X_i' \lambda + \delta_{ft} + \delta_{uf} + u_i \quad (5)$$

This model studies how the average distance of job opportunities affects application intensity. The interaction term allows for gender-specific responses to market geography.

## Model 3: Hiring and Distance

$$\text{Success}_i = \theta_0 + \theta_1 \text{Av. Distance}_{ft} + \theta_2 \text{Female}_i \times \text{Av. Distance}_{ft} + X_i' \phi + \delta_{ft} + \delta_{uf} + \eta_i \quad (6)$$

This model tests whether the average distance of job opportunities directly affects hiring outcomes. A negative coefficient would suggest that candidates are less likely to be hired when job openings are, on average, farther from their PhD institution.

In these equations,  $\text{Success}_i$  is a binary indicator for whether candidate  $i$  secures a junior permanent position. The variable  $\text{Av. Distance}_{ft}$  is the average great-circle distance between the candidate's PhD institution and all job openings in their academic field  $f$  and year  $t$ . The vector  $X_i$  includes controls for age, research productivity (both quantity and quality), and PhD supervisor gender. All regressions include fixed effects for discipline-year ( $\delta_{ft}$ ) and Discipline-PhD university ( $\delta_{uf}$ ), which capture variation in job market conditions and institutional training quality.

## 5.3 Empirical Results: Applications, Distance, and Hiring

This section presents the empirical results from Models 4 to 6. I begin by estimating how application intensity relates to hiring outcomes, then assess how average market distance affects application behavior and hiring. Finally, I explore whether these effects differ by gender.

Table 3 presents OLS estimates of how application intensity and job market dispersion relate to the probability of securing a junior permanent academic position. The focus is on understanding whether applying more frequently increases success, whether this effect differs by gender, and whether distance plays a role in shaping both application behavior and hiring outcomes.

Model 4 (Column (1)) estimates the relationship between the number of applications and the probability of being hired, without any controls. The coefficient on  $\ln(\text{Apps} + 1)$  is 0.098, statistically significant at the 1% level, suggesting that a 10% increase in the number of applications is associated with a 0.98 pp increase in the probability of securing a permanent position. The interaction with the female dummy is also positive

Table 3: Application Behavior and Hiring Outcomes: OLS and Reduced-Form Estimates

|                               | (1)                      | (2)                    | (3)                         | (4)                          |
|-------------------------------|--------------------------|------------------------|-----------------------------|------------------------------|
| Dependent variable:           | <i>Success</i>           | <i>Success</i>         | $\ln(Apps+1)$               | <i>Success</i>               |
| Female                        | -0.00908***<br>(0.00305) | -0.00489<br>(0.00318)  | 0.0348<br>(0.0287)          | 0.0116<br>(0.00895)          |
| $\ln(Apps+1)$                 | 0.0978***<br>(0.00151)   | 0.0855***<br>(0.00167) |                             |                              |
| Female $\times$ $\ln(Apps+1)$ | 0.00716***<br>(0.00228)  | 0.00346<br>(0.00230)   |                             |                              |
| Av. Distance                  |                          |                        | -0.000346***<br>(0.0000874) | -0.0000986***<br>(0.0000273) |
| Female $\times$ Av. Distance  |                          |                        | -0.000211***<br>(0.0000752) | -0.0000470**<br>(0.0000235)  |
| Controls                      |                          | yes                    | yes                         | yes                          |
| Field-Year FE                 |                          | yes                    | yes                         | yes                          |
| Field-Univ PhD FE             |                          | yes                    | yes                         | yes                          |
| Observations                  | 51,544                   | 51,391                 | 51,391                      | 51,391                       |

*Notes:* All regressions are estimated by OLS. The dependent variable in columns (1), (2), and (4) is *Success*, a binary indicator equal to 1 if the candidate secures a junior permanent academic position. The dependent variable in Column (3) is the log number of applications submitted ( $\ln(Apps+1)$ ). The key explanatory variables are:  $\ln(Apps+1)$ , the log number of applications submitted by the candidate; *Female*, a dummy equal to 1 for women; and the interaction *Female*  $\times$   $\ln(Apps+1)$ . Columns (1) and (2) estimate the relationship between applications and success. Column (2)-(4) add controls for candidate characteristics (age, research productivity, supervisor gender) and fixed effects for field-year and field-PhD institution. Column (3) estimates how the *Average Distance* of job openings in a candidate's field and year affects the number of applications submitted. Column (4) estimates how *Average Distance* affects hiring outcomes directly. The variable *Average Distance* is defined as the mean great-circle distance between the candidate's PhD institution and all job openings in their field and year of application. Standard errors are reported in parentheses. Significance levels: \*  $p < 0.10$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$ .

and significant, indicating that women may benefit slightly more from applying to more jobs. (Column (2)) adds a rich set of controls for candidate characteristics (e.g. age, publication metrics, supervisor gender), along with fixed effects for field-year and field-PhD university. The coefficient on  $\ln(\text{Apps} + 1)$  remains large and significant at 0.086, showing that the positive association between application intensity and success is robust to these additional controls. The interaction term ( $\text{Female} \times \ln(\text{Apps} + 1)$ ) is still positive but loses statistical significance, suggesting that any gender difference in the returns to applying is modest and sensitive to controls.

Model 5 (Column (3)) focuses on application behavior. The dependent variable is the log number of applications, and the key explanatory variable is the *Average Distance* of job opportunities in the candidate’s field and year. The coefficient is -0.00035, highly significant, implying that a 100km increase in average job distance is associated with a 3.5% decrease in the number of applications submitted. The interaction with gender is also negative and significant, indicating that female candidates reduce their application effort more than men when the market is more spatially dispersed. This suggests that women are more sensitive to mobility frictions in their application behavior.

Model 6 (Column (4)) estimates the direct association between market dispersion and hiring. The dependent variable is again *Success*, and the key regressor is the average distance of job openings. The coefficient on *Average Distance* is negative and significant: a 100km increase in average distance is associated with a 0.986 pp decrease in the probability of securing a position. The interaction with gender is also negative and statistically significant. This result implies that job market structure not only affects application behavior but also has direct consequences for hiring, especially for women.

Taken together, the results from Models 1 to 3 suggest that market-level geographic distance influences both application behavior and hiring outcomes. Women respond more negatively to distant markets when deciding how many applications to submit, and they also appear to benefit slightly less from each additional application. This creates an indirect channel through which spatial constraints can amplify gender disparities in academic hiring.

## 5.4 Graphical Evidence: Hiring Outcomes and Market Distance

To complement the regression analysis, I provide a graphical illustration of how geographic distance relates to hiring outcomes, conditional on application.

Figure 3 plots the probability of being hired into a job, given that an application was submitted, against the distance between the candidate’s PhD institution and the job location. This conditional approach abstracts from differences in application behavior and focuses on the final stage of the hiring process.

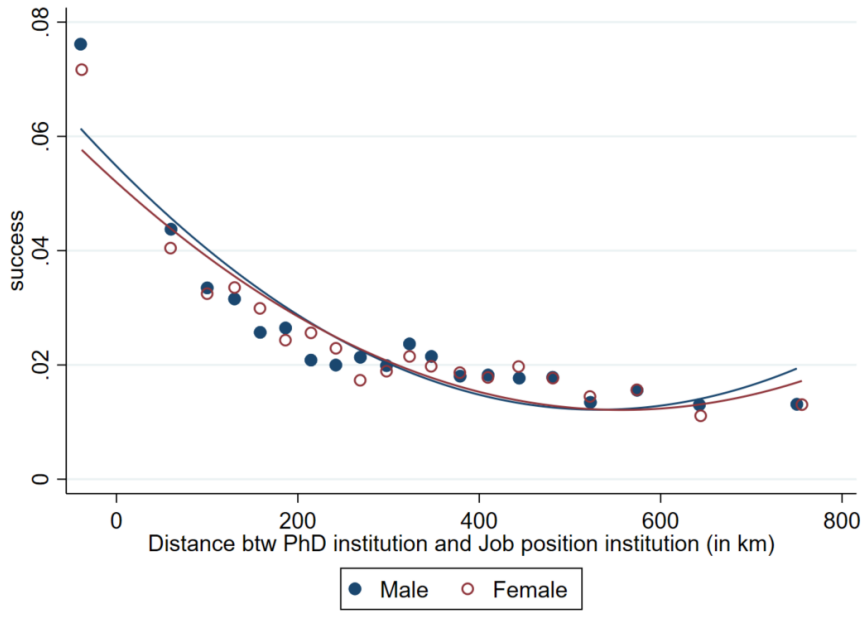


Figure 3: Hiring Probability Conditional on Applying, by Distance and Gender

*Notes:* The figure shows binned averages of the hiring probability, conditional on application, by distance between the candidate's PhD institution and the job posting (in kilometers). Quadratic fits are plotted separately for men (solid blue circles) and women (red open circles). The regression includes fixed effects for job institution, academic field, and year, and controls for age (and age squared), publication quantity and quality, and supervisor characteristics.

This approach follows [Le Barbanchon et al. \(2020\)](#), who analyze hiring patterns conditional on application. The figure reveals a strong negative relationship between distance and hiring probability for both men and women. Success rates fall as jobs are located farther away from the candidate's PhD institution.

Table [A4](#) confirms this pattern. The probability of being hired declines with distance for both genders. While the marginal effect is slightly smaller for women, the difference is small and only marginally significant. This suggests that, conditional on applying, women are not penalized more than men based on geographic distance.

## 5.5 Back-of-the-Envelope Quantification

To quantify how job market geography contributes to gender disparities in hiring, I use a back-of-the-envelope calculation based on the estimates from Model [6](#). This model relates the average distance between a candidate's PhD institution and available job openings to the probability of securing a permanent academic position.

Let  $\hat{\theta}_1$  denote the coefficient on *Average Distance* and  $\hat{\theta}_2$  the coefficient on its interaction with the female dummy. The effect of average market distance on hiring

outcomes is then computed separately for men and women as:

$$\text{Effect}_{\text{men}} = \hat{\theta}_1 \times \overline{\text{Distance}}$$

$$\text{Effect}_{\text{women}} = (\hat{\theta}_1 + \hat{\theta}_2) \times \overline{\text{Distance}}.$$

Using the estimates from Table 3, Column (4), with  $\hat{\theta}_1 = -0.0000986$ ,  $\hat{\theta}_2 = -0.0000470$ , and an average market distance for all candidates of 365 kilometers, the implied effects are a 3.6 pp reduction in hiring probability for men and a 5.31 pp reduction for women. The difference, equal to 1.71 pp, captures women’s stronger sensitivity to distance, relative to men, in their likelihood of securing a position, conditional on facing the same job market structure, relative to men. Given a baseline hiring rate of 8.6% in our sample (see Table A), this gap represents approximately 20% of the average success probability.

## 6 Conclusion

This paper investigates how geographic mobility constraints contribute to gender disparities in academic hiring, using comprehensive administrative data on all PhD graduates and job openings in France between 2009 and 2021. By linking each candidate to the full set of job opportunities in their field and year, I construct a novel candidate-position dataset to study how spatial frictions, particularly distance from the PhD institution, influence both application decisions and hiring outcomes.

The analysis yields three main findings. First, distance significantly reduces the likelihood of applying to a position, with a stronger effect for women. Female candidates are more likely to apply locally and are more sensitive to the geographic structure of job opportunities. Second, geographic constraints affect hiring outcomes: candidates facing more distant markets apply to fewer jobs and are less likely to secure a permanent academic position. Third, because women respond more negatively to distance, they experience lower hiring probabilities than men, even when exposed to the same job market structure. A back-of-the-envelope calculation suggests that women’s stronger sensitivity to geographic distance translates into a 1.7 percentage point lower hiring probability, relative to men. This gap amounts to approximately 20% of the average hiring rate.

An important challenge for future research is to understand the roots of women’s lower geographic mobility across labor markets. Potential explanations include family responsibilities, dual-career considerations, and attachment to place, but direct evidence remains limited. Clarifying whether these constraints are primarily structural, cultural,

or personal is essential to designing effective policies that promote equal access to job opportunities.

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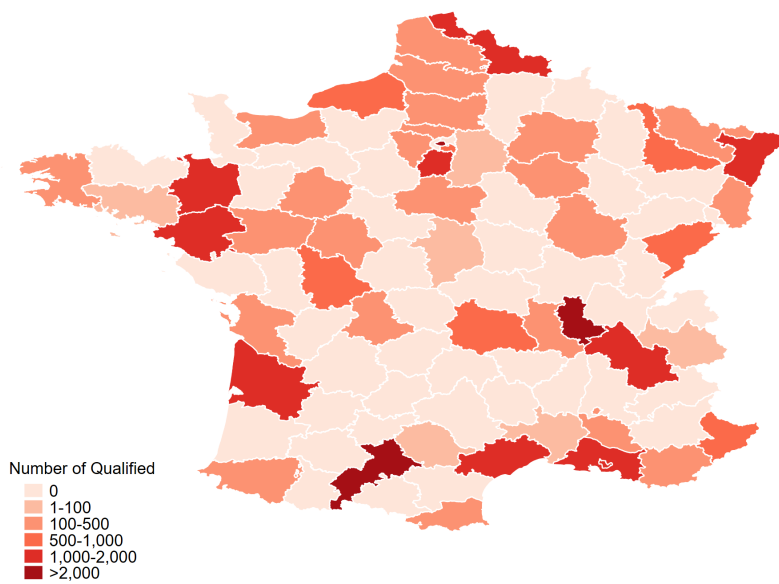
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# Appendix

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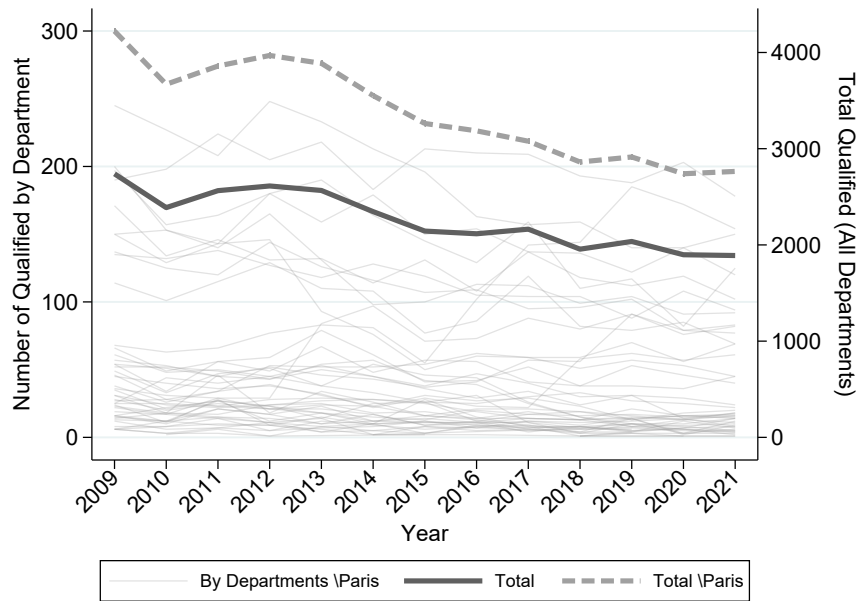
## A Additional Figures and Tables

Figure A1: Cumulative Number of Qualified Candidates by Department of PhD (2009–2021)



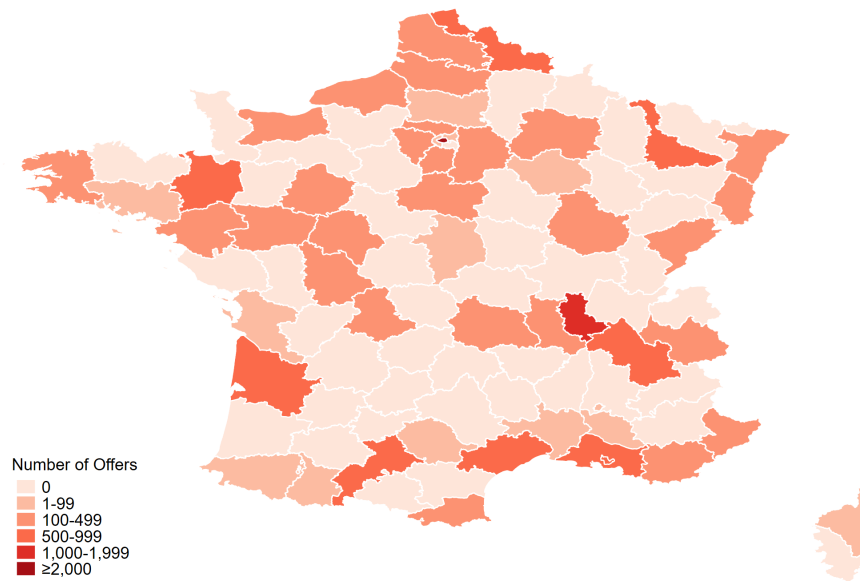
*Notes:* This map shows the total number of candidates qualified for junior permanent academic positions (*Maitre de Conférence*) between 2009 and 2021, based on the city location of their PhD institution. Values are aggregated at the departmental level (96 mainland French departments). Departments with darker shading indicate higher numbers of qualified candidates. The spatial distribution is highly concentrated, with Paris (département 75) alone accounting for over 14,500 qualifiers - nearly 30% of the national total. 30 rural or peripheral departments recorded zero qualifiers over the same period.

Figure A2: Annual Number of Qualified Candidates by Department (2009–2021)



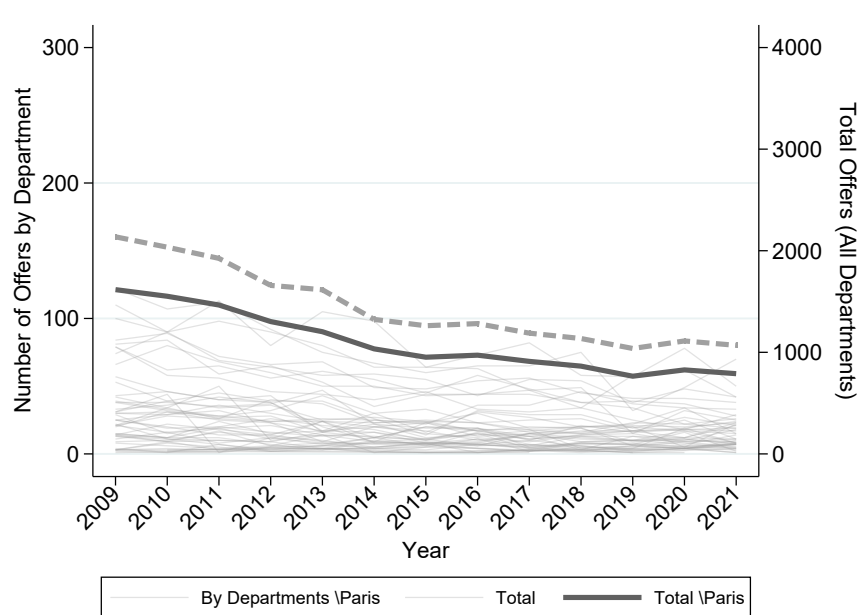
*Notes:* The figure shows the annual number of candidates qualified to apply for junior permanent academic positions (*Maître de Conférence*) from 2009 to 2021, by *department* of PhD graduation's city. Department-level trends (left y-axis) exclude Paris to improve readability. Two national totals are shown on the right y-axis: the dashed line includes Paris, while the solid line excludes it. Paris is excluded from the department lines due to its much larger volume (over 14,500 qualifiers during the period), which would otherwise compress variation across other departments.

Figure A3: Cumulative Number of Permanent Academic Job Offers by Department (2009–2021)



*Notes:* This map shows the cumulative number of junior permanent academic (*Maître de Conférence*) job offers between 2009 and 2021, aggregated by the *département* of the hiring institution. The color scale is consistent with Figure A1 (qualified candidates), allowing for visual comparison. Paris (*département* 75) had the highest number of positions (4,529), while more than 20 departments recorded zero offers during this period.

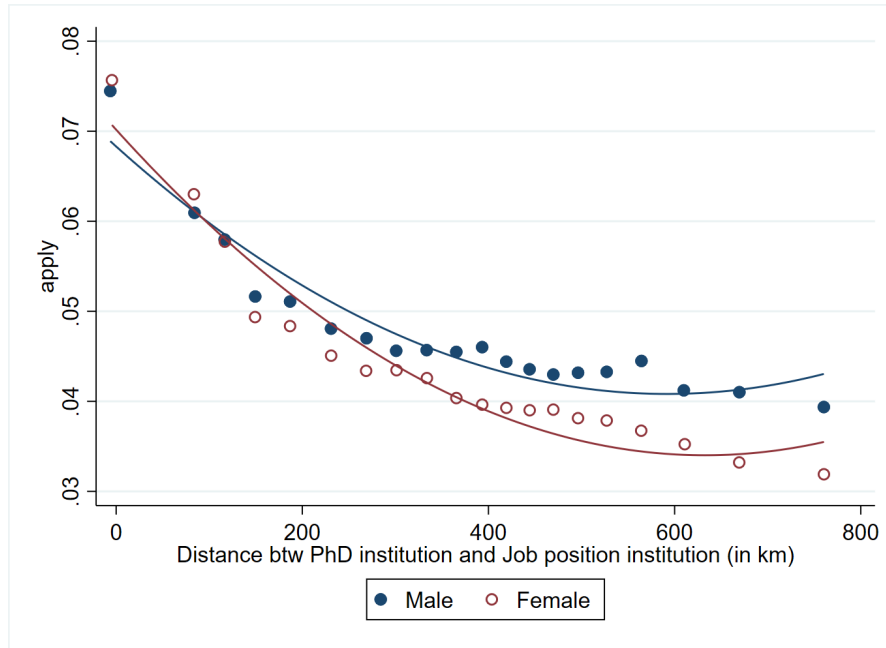
Figure A4: Annual Number of Permanent Academic Job Offers by Department (2009–2021)



*Notes:* This figure shows the number of junior permanent academic (*Maître de Conférence*) job offers from 2009 to 2021. Department-level trends are plotted on the left y-axis (excluding Paris for readability). The right y-axis displays national totals: the dashed line includes Paris, while the solid line excludes it. Paris is excluded from department-level lines due to its large scale, which would otherwise compress variation across other departments.

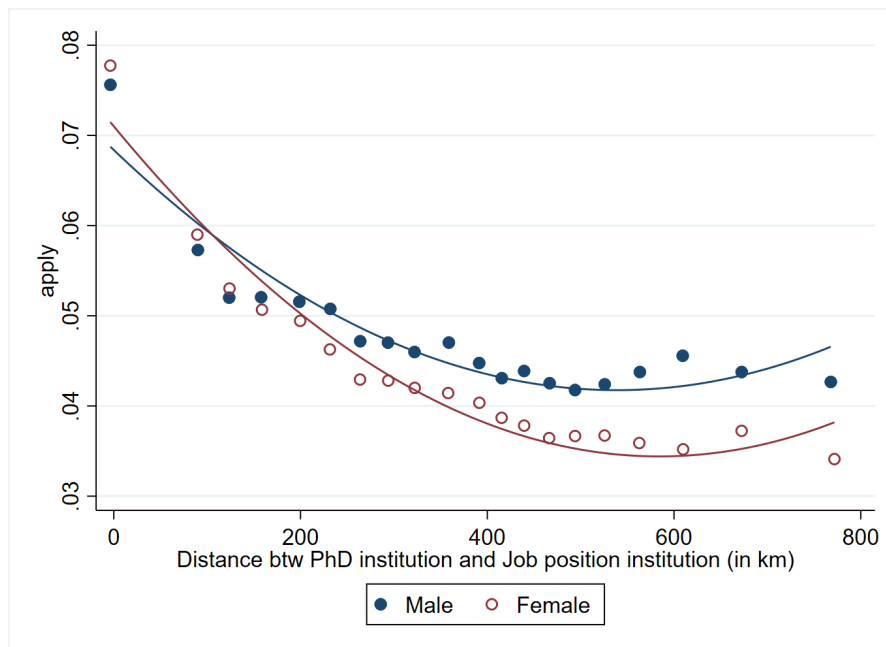


Figure A5: Probability to Apply by Distance to Job Offers by Gender



*Notes:* The figure presents a binned scatterplot of the application rate versus the distance from the candidate's PhD institution and the position institution, shown separately by gender. The application rate and distance are residualized controlling for age, publication metrics, supervisor characteristics, and PhD institution  $\times$  Field  $\times$  year fixed effects.

Figure A6: Probability to Apply by Distance to Job Offers by Gender



*Notes:* The figure presents a binned scatterplot of the application rate versus the distance from the candidate's PhD institution and the position institution, shown separately by gender. The application rate and distance are residualized controlling for age, publication metrics, supervisor characteristics, and Job position's institution  $\times$  Field  $\times$  year fixed effects.

Table A1: Descriptive Statistics

| Variable                  | <i>Male</i> |       |       | <i>Female</i> |       |       |
|---------------------------|-------------|-------|-------|---------------|-------|-------|
|                           | N           | Mean  | SD    | N             | Mean  | SD    |
| Apply Position            | 28,822      | 0.51  | 0.50  | 22,722        | 0.53  | 0.50  |
| Number Applications       | 28,822      | 3.55  | 7.44  | 22,722        | 3.57  | 7.15  |
| Securing Position         | 28,822      | 0.09  | 0.28  | 22,722        | 0.09  | 0.28  |
| Age                       | 28,822      | 33.10 | 5.78  | 22,722        | 33.71 | 6.01  |
| Time since PhD            | 28,822      | 2.89  | 2.85  | 22,722        | 2.82  | 2.78  |
| Publish                   | 28,822      | 0.64  | 0.48  | 22,722        | 0.49  | 0.50  |
| Number Publications       | 28,822      | 5.37  | 18.01 | 22,722        | 2.90  | 11.70 |
| Total AIS                 | 28,822      | 5.85  | 34.76 | 22,722        | 3.29  | 19.44 |
| Female Supervisor         | 28,822      | 0.24  | 0.43  | 22,722        | 0.36  | 0.48  |
| Total AIS Supervisor      | 28,822      | 0.07  | 0.96  | 22,722        | 0.06  | 0.89  |
| <i>Disciplines</i>        |             |       |       |               |       |       |
| Biological Science        | 24,730      | 0.07  | 0.26  | 19,241        | 0.12  | 0.32  |
| Chemical Science          | 24,730      | 0.05  | 0.22  | 19,241        | 0.04  | 0.21  |
| Computer Science          | 24,730      | 0.11  | 0.31  | 19,241        | 0.04  | 0.21  |
| Earth Science             | 24,730      | 0.04  | 0.20  | 19,241        | 0.05  | 0.22  |
| Economics                 | 24,730      | 0.03  | 0.18  | 19,241        | 0.03  | 0.17  |
| Engineering               | 24,730      | 0.13  | 0.34  | 19,241        | 0.06  | 0.25  |
| Humanities                | 24,730      | 0.18  | 0.38  | 19,241        | 0.31  | 0.46  |
| Law and Political Science | 24,730      | 0.05  | 0.22  | 19,241        | 0.06  | 0.23  |
| Literature                | 24,730      | 0.05  | 0.21  | 19,241        | 0.12  | 0.32  |
| Management Sciences       | 24,730      | 0.03  | 0.17  | 19,241        | 0.05  | 0.21  |
| Mathematics               | 24,730      | 0.08  | 0.27  | 19,241        | 0.03  | 0.18  |
| Philosophy and Theology   | 24,730      | 0.03  | 0.16  | 19,241        | 0.02  | 0.15  |
| Physical Science          | 24,730      | 0.15  | 0.36  | 19,241        | 0.07  | 0.25  |

*Notes:* This table presents statistics for the key variables in the paper and the different disciplines of the qualified PhD graduates at their first year of application, if they were interested in applying for at least one position.

Table A2: Summary Statistics of Application Dataset

|  | Mean<br>(1) | Std. dev.<br>(2) | Obs<br>(3) |
|--|-------------|------------------|------------|
| Panel A: Application level                       |             |                  | 183,238    |
| Secure position                                  | 0.024       | 0.155            |            |
| Female applicants                                | 0.442       | 0.497            |            |
| Distance (km)                                    | 325.117     | 233.884          |            |
| Panel B: Job offers level                        |             |                  |            |
| Secured position (Sample) <sup>a</sup>           | 0.234       | 0.423            | 18,785     |
| Secured position (Total) <sup>b</sup>            | 0.939       | 0.239            | 22,688     |
| Number applicants per offer (Total) <sup>b</sup> | 133.916     | 116.984          |            |
| Panel C: Applicant level                         |             |                  | 30,750     |
| Female   | 0.452       | 0.498            |            |
| Secure position                                  | 0.146       | 0.353            |            |
| Number applications                              | 5.959       | 8.261            |            |
| Age  | 33.475      | 5.808            |            |
| Time since PhD                                   | 2.521       | 2.605            |            |
| Number Publications                              | 3.187       | 11.718           |            |
| Total AIS  | 2.754       | 20.76            |            |
| Female Supervisor                                | 0.295       | 0.456            |            |
| Total AIS Supervisor                             | 0.021       | 0.765            |            |

*Notes:* This table reports summary statistics on qualified candidate's application for junior permanent positions offers. In Panel A, I report statistics at the application level. In Panel B, I collapse the data set at the offer level. In Panel C, I collapse the data set at the applicant/qualified level.

<sup>a</sup>Represents the success rate in the sample of PhD graduates from France qualified and applying for at least one position the first year of qualification - the sample used in the estimation.

<sup>b</sup>Represents the total sample of job offers between 2009 and 2021 and the success rate among all candidates

Table A3: Gender and Success Rates Across Panel Specifications

|                                      | Panel A: Full Panel   |                       |                          | Panel B: First Year Apply    |                        |                         |
|--------------------------------------|-----------------------|-----------------------|--------------------------|------------------------------|------------------------|-------------------------|
|                                      | (1)                   | (2)                   | (3)                      | (4)                          | (5)                    | (6)                     |
|                                      | Baseline              | + Controls            | + FE                     | Baseline                     | + Controls             | + FE                    |
| female                               | 0.00140<br>(0.00101)  | 0.000889<br>(0.00103) | -0.00477***<br>(0.00110) | 0.000341<br>(0.00250)        | -0.000475<br>(0.00254) | -0.00564**<br>(0.00284) |
| Constant                             | 0.0474***<br>(0.0007) | 0.382***<br>(0.0139)  | 0.391***<br>(0.0156)     | <b>0.0868***</b><br>(0.0017) | 0.420***<br>(0.0334)   | 0.435***<br>(0.0396)    |
| Field $\times$ Univ $\times$ Year FE |                       |                       | Yes                      |                              |                        | Yes                     |
| Controls                             |                       | Yes                   | Yes                      |                              | Yes                    | Yes                     |
| Observations                         | 181,084               | 181,084               | 178,256                  | 51,544                       | 51,544                 | 47,970                  |

Notes: *Success* is a dummy variable equal to 1 if the individual secured a permanent position. The OLS is measured at the candidate level. Column (1) includes no controls. Column (2) add applicant characteristics (age, publication volume and quality, supervisor characteristics) and Column (3) add field, year, and job univ fixed effects. Panel A represents the full population of qualified individuals and Panel B represents the restricted sample of individuals during the first year of application. Standard errors in parentheses. \*  $p < 0.10$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$ .

Table A4: Effect of Distance to Job on Hiring Probability, by Gender

|                                       | (1)                               | (2)                          | (3)                          |
|---------------------------------------|-----------------------------------|------------------------------|------------------------------|
|                                       | <i>Probability of being hired</i> |                              |                              |
| Distance (km)                         | -0.000132***<br>(0.00000648)      | -0.000132***<br>(0.00000647) | -0.000164***<br>(0.00000716) |
| Distance <sup>2</sup>                 | 1.22e-07***<br>(8.75e-09)         | 1.23e-07***<br>(8.75e-09)    | 1.53e-07***<br>(9.64e-09)    |
| Female                                | -0.00456***<br>(0.00150)          | -0.00336**<br>(0.00151)      | -0.00281*<br>(0.00158)       |
| Distance $\times$ Female              | 0.0000173*<br>(0.00000969)        | 0.0000177*<br>(0.00000968)   | 0.00000488<br>(0.0000101)    |
| Distance <sup>2</sup> $\times$ Female | -1.23e-08<br>(1.33e-08)           | -1.28e-08<br>(1.33e-08)      | 3.23e-09<br>(1.39e-08)       |
| <i>Marginal effect of distance</i>    |                                   |                              |                              |
| Men                                   | -0.000132***                      | -0.000132***                 | -0.000164***                 |
| Women                                 | -0.000115                         | -0.000114                    | -0.000159                    |
| Women - Men                           | 0.0000173*<br>(0.00000969)        | 0.0000177*<br>(0.00000968)   | 0.00000488<br>(0.0000101)    |
| Controls                              |                                   | Yes                          | Yes                          |
| FE: Field, Year, Univ <sub>j</sub>    |                                   |                              | Yes                          |
| Observations                          | 183,238                           | 183,238                      | 180,874                      |

Notes: OLS estimates of the effect of geographic distance on hiring probability, measured at the candidate-job level. Distance is the great-circle distance between the candidate's PhD institution and the job institution. The outcome is a binary Indicator equal to 1 if the candidate is hired into the position. Column (1) includes no controls. Columns (2) and (3) add applicant characteristics (age, publication volume and quality, supervisor characteristics). All models absorb field, year, and job univ fixed effects. Standard errors in parentheses. \*  $p < 0.10$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$ .

## B Additional Descriptive Statistics

## B.1 Success Sample

Table B5: Descriptive Statistics - Success Sample

| Variable                  | <i>Male</i> |       |       | <i>Female</i> |       |       |
|---------------------------|-------------|-------|-------|---------------|-------|-------|
|                           | N           | Mean  | SD    | N             | Mean  | SD    |
| Number Applications       | 2,503       | 11.15 | 12.63 | 1,981         | 11.94 | 12.57 |
| Age                       | 2,503       | 31.79 | 4.87  | 1,981         | 32.51 | 5.18  |
| Time since PhD            | 2,503       | 1.99  | 2.12  | 1,981         | 1.89  | 1.99  |
| Publish                   | 2,503       | 0.60  | 0.49  | 1,981         | 0.44  | 0.50  |
| Number Publications       | 2,503       | 4.16  | 9.22  | 1,981         | 1.95  | 4.71  |
| Total AIS                 | 2,503       | 3.25  | 26.08 | 1,981         | 1.59  | 7.49  |
| Female Supervisor         | 2,503       | 0.23  | 0.42  | 1,981         | 0.37  | 0.48  |
| Total AIS Supervisor      | 2,503       | 0.03  | 0.76  | 1,981         | 0.02  | 0.58  |
| <i>Disciplines</i>        |             |       |       |               |       |       |
| Biological Science        | 2,503       | 0.03  | 0.18  | 1,981         | 0.04  | 0.19  |
| Chemical Science          | 2,503       | 0.03  | 0.17  | 1,981         | 0.01  | 0.12  |
| Computer Science          | 2,503       | 0.11  | 0.31  | 1,981         | 0.04  | 0.19  |
| Earth Science             | 2,503       | 0.02  | 0.13  | 1,981         | 0.01  | 0.11  |
| Economics                 | 2,503       | 0.06  | 0.24  | 1,981         | 0.07  | 0.25  |
| Engineering               | 2,503       | 0.13  | 0.33  | 1,981         | 0.05  | 0.22  |
| Humanities                | 2,503       | 0.15  | 0.36  | 1,981         | 0.26  | 0.44  |
| Law and Political Science | 2,503       | 0.14  | 0.35  | 1,981         | 0.16  | 0.37  |
| Literature                | 2,503       | 0.06  | 0.23  | 1,981         | 0.13  | 0.34  |
| Management Sciences       | 2,503       | 0.09  | 0.28  | 1,981         | 0.14  | 0.34  |
| Mathematics               | 2,503       | 0.08  | 0.28  | 1,981         | 0.04  | 0.20  |
| Philosophy and Theology   | 2,503       | 0.01  | 0.10  | 1,981         | 0.01  | 0.11  |
| Physical Science          | 2,503       | 0.09  | 0.28  | 1,981         | 0.03  | 0.18  |

*Notes:* This table presents statistics for the key variables in the paper and the different disciplines of the qualified PhD graduates at their first year of application, if they were interested in applying for at least one position.

## B.2 Descriptive Statistics by Fields

Table B6: Descriptive Statistics - Biological & Earth Sciences

| Variable             | <i>Male</i> |       |       | <i>Female</i> |       |       |
|----------------------|-------------|-------|-------|---------------|-------|-------|
|                      | N           | Mean  | SD    | N             | Mean  | SD    |
| Apply Position       | 3,521       | 0.30  | 0.46  | 3,821         | 0.27  | 0.44  |
| Number Applications  | 3,521       | 0.73  | 1.94  | 3,821         | 0.59  | 1.64  |
| Securing Position    | 3,521       | 0.04  | 0.19  | 3,821         | 0.03  | 0.16  |
| Age                  | 3,521       | 32.36 | 3.96  | 3,821         | 31.73 | 3.62  |
| Time since PhD       | 3,521       | 4.12  | 3.13  | 3,821         | 3.82  | 3.00  |
| Publish              | 3,521       | 0.52  | 0.50  | 3,821         | 0.55  | 0.50  |
| Number Publications  | 3,521       | 5.15  | 8.36  | 3,821         | 4.72  | 12.00 |
| Total AIS            | 3,521       | 9.65  | 18.21 | 3,821         | 9.01  | 20.08 |
| Female Supervisor    | 3,521       | 0.32  | 0.47  | 3,821         | 0.39  | 0.49  |
| Total AIS Supervisor | 3,521       | 0.04  | 0.72  | 3,821         | 0.02  | 0.93  |

*Notes:* This table presents statistics for the key variables in the paper for the field of Biological and Earth Sciences of the qualified PhD graduates at their first year of application, if they were interested in applying for at least one position.

Table B7: Descriptive Statistics - Humanities

| Variable             | <i>Male</i> |       |      | <i>Female</i> |       |      |
|----------------------|-------------|-------|------|---------------|-------|------|
|                      | N           | Mean  | SD   | N             | Mean  | SD   |
| Apply Position       | 7,847       | 0.62  | 0.48 | 10,719        | 0.63  | 0.48 |
| Number Applications  | 7,847       | 2.91  | 4.34 | 10,719        | 3.01  | 4.26 |
| Securing Position    | 7,847       | 0.07  | 0.26 | 10,719        | 0.08  | 0.26 |
| Age                  | 7,847       | 37.30 | 6.99 | 10,719        | 36.22 | 6.70 |
| Time since PhD       | 7,847       | 3.28  | 3.23 | 10,719        | 2.95  | 2.97 |
| Publish              | 7,847       | 0.43  | 0.49 | 10,719        | 0.36  | 0.48 |
| Number Publications  | 7,847       | 1.28  | 3.03 | 10,719        | 0.89  | 2.11 |
| Total AIS            | 7,847       | 0.39  | 2.64 | 10,719        | 0.23  | 1.37 |
| Female Supervisor    | 7,847       | 0.29  | 0.45 | 10,719        | 0.40  | 0.49 |
| Total AIS Supervisor | 7,847       | 0.04  | 0.97 | 10,719        | 0.03  | 0.79 |

*Notes:* This table presents statistics for the key variables in the paper for the field of Humanities of the qualified PhD graduates at their first year of application, if they were interested in applying for at least one position.

Table B8: Descriptive Statistics - STEM

| Variable             | <i>Male</i> |       |       | <i>Female</i> |       |       |
|----------------------|-------------|-------|-------|---------------|-------|-------|
|                      | N           | Mean  | SD    | N             | Mean  | SD    |
| Apply Position       | 14,396      | 0.45  | 0.50  | 5,384         | 0.42  | 0.49  |
| Number Applications  | 14,396      | 2.59  | 5.60  | 5,384         | 2.21  | 4.90  |
| Securing Position    | 14,396      | 0.08  | 0.26  | 5,384         | 0.07  | 0.25  |
| Age                  | 14,396      | 30.89 | 3.96  | 5,384         | 30.40 | 3.65  |
| Time since PhD       | 14,396      | 2.52  | 2.51  | 5,384         | 2.29  | 2.20  |
| Publish              | 14,396      | 0.84  | 0.37  | 5,384         | 0.80  | 0.40  |
| Number Publications  | 14,396      | 8.59  | 24.56 | 5,384         | 6.73  | 20.90 |
| Total AIS            | 14,396      | 9.06  | 47.93 | 5,384         | 6.87  | 35.27 |
| Female Supervisor    | 14,396      | 0.20  | 0.40  | 5,384         | 0.29  | 0.45  |
| Total AIS Supervisor | 14,396      | 0.13  | 1.03  | 5,384         | 0.17  | 1.07  |

*Notes:* This table presents statistics for the key variables in the paper for the field of STEM of the qualified PhD graduates at their first year of application, if they were interested in applying for at least one position.

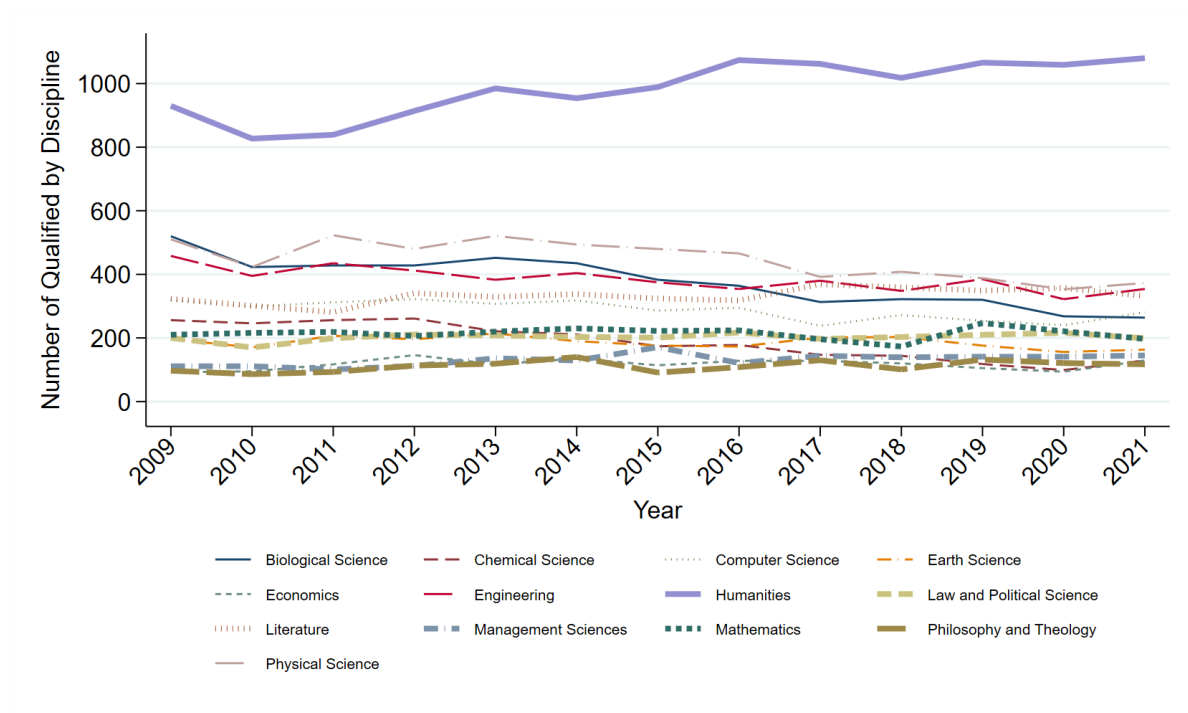
Table B9: Descriptive Statistics - Social Sciences

| Variable             | <i>Male</i> |       |       | <i>Female</i> |       |       |
|----------------------|-------------|-------|-------|---------------|-------|-------|
|                      | N           | Mean  | SD    | N             | Mean  | SD    |
| Apply Position       | 3,058       | 0.75  | 0.43  | 2,798         | 0.74  | 0.44  |
| Number Applications  | 3,058       | 12.94 | 14.79 | 2,798         | 12.39 | 14.20 |
| Securing Position    | 3,058       | 0.24  | 0.43  | 2,798         | 0.26  | 0.44  |
| Age                  | 3,058       | 33.58 | 5.33  | 2,798         | 33.15 | 5.16  |
| Time since PhD       | 3,058       | 2.24  | 2.38  | 2,798         | 1.98  | 2.17  |
| Publish              | 3,058       | 0.35  | 0.48  | 2,798         | 0.33  | 0.47  |
| Number Publications  | 3,058       | 0.98  | 2.15  | 2,798         | 0.79  | 2.05  |
| Total AIS            | 3,058       | 0.40  | 1.71  | 2,798         | 0.30  | 1.36  |
| Female Supervisor    | 3,058       | 0.24  | 0.43  | 2,798         | 0.33  | 0.47  |
| Total AIS Supervisor | 3,058       | 0.02  | 0.77  | 2,798         | 0.05  | 0.76  |

*Notes:* This table presents statistics for the key variables in the paper for the field of Social Sciences of the qualified PhD graduates at their first year of application, if they were interested in applying for at least one position.

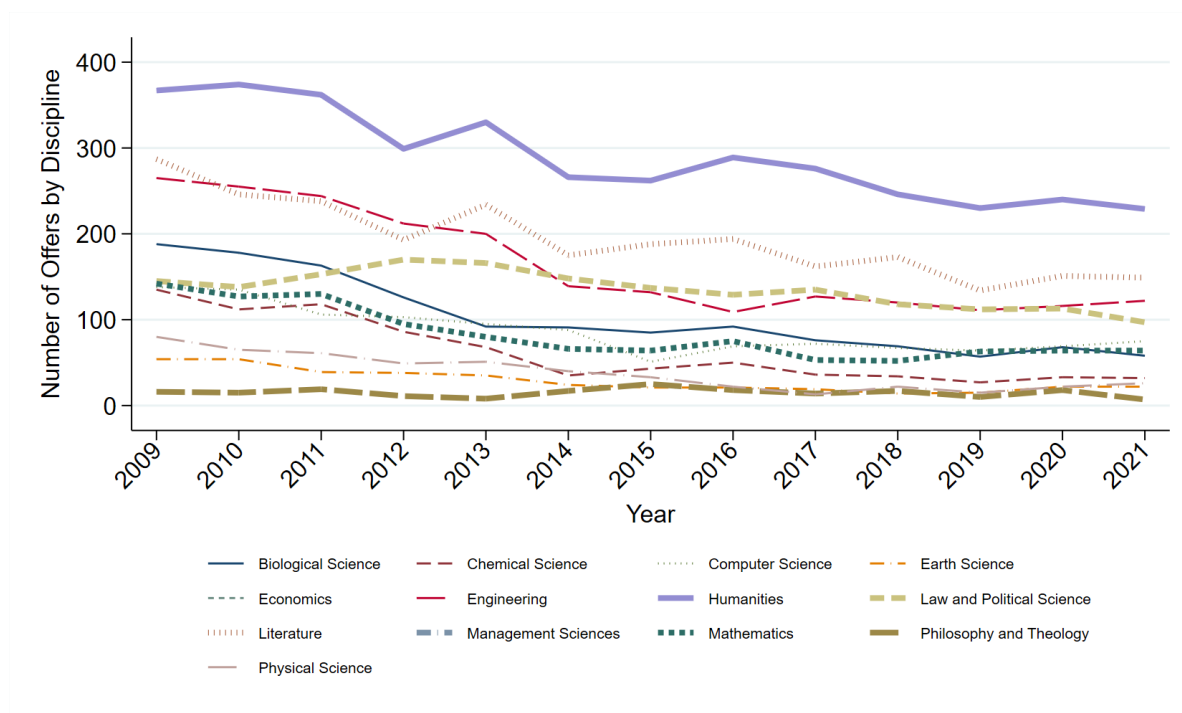


Figure B7: Number of Qualified by Discipline, 2009-2021



Notes: This figure plots the annual number of qualified candidates for junior permanent position (*Maître de Conférence*), disaggregated by discipline.

Figure B8: Number of Job Offers by Discipline, 2009-2021



Notes: This figure plots the annual number of junior position (*Maître de Conférence*) offers in French public universities, disaggregated by discipline.

### B.3 Description Sub-Disciplines

| Fields                           | Section | Label (fr/eng)  |
|----------------------------------|---------|---|
| <b>Law and Political Science</b> | 01      | Droit privé et sciences criminelles - Private law and criminal sciences   |
|                                  | 02      | Droit public - Public law   |
|                                  | 03      | Histoire du droit et des institutions - History of law and institutions   |
|                                  | 04      | Science politique - Political Science   |
| <b>Economics</b>                 | 05      | Sciences économiques  |
| <b>Management</b>                | 06      | Sciences de gestion et du management  |
| <b>Literature</b>                | 07      | Sciences du langage - Language sciences   |
|                                  | 08      | Langues et littératures anciennes - Ancient languages and literature  |
|                                  | 09      | Langue et littérature française - French language and literature  |
|                                  | 10      | Littératures comparées - Comparative literature   |
|                                  | 11      | Études anglophones - English-language studies   |
|                                  | 12      | Études germaniques et scandinaves - Germanic and Scandinavian Studies   |
|                                  | 13      | Études slaves et baltes - Slavic and Baltic Studies   |
|                                  | 14      | Études romanes - Romance languages and literature   |
|                                  | 15      | Langues, littératures et cultures africaines, asiatiques et d'autres aires linguistiques - Languages, literatures and cultures of Africa, Asia and other linguistic areas                                 |
|                                  | 73      | Cultures et langues régionales - Regional cultures and languages  |
| <b>Humanities</b>                | 16      | Psychologie et ergonomie - Psychology and ergonomics  |
|                                  | 18      | Architecture (ses théories et ses pratiques), arts appliqués, arts plastiques, arts du spectacle, épistémologie des enseignements artistiques, esthétique, musicologie, musique, sciences de l'art - Arts |
|                                  | 19      | Sociologie, démographie - Sociology, demography   |
|                                  | 20      | Ethnologie, préhistoire, anthropologie biologique - Biological anthropology, ethnology, prehistory  |
|                                  | 21      | Histoire, civilisations, archéologie et art des mondes anciens et médiévaux - History, civilization: archaeology, art of ancient worlds   |
|                                  | 22      | Histoire et civilisations : histoire des mondes modernes, histoire du monde contemporain ; de l'art ; de la musique - History, civilizations: history of modern worlds                                    |
|                                  | 23      | Géographie physique, humaine, économique et régionale - Physical, human, economic and regional geography  |
|                                  | 24      | Aménagement de l'espace, urbanisme - Spatial planning and urban development   |
|                                  | 70      | Sciences de l'éducation et de la formation - Education sciences   |
|                                  | 71      | Sciences de l'information et de la communication - Information and communication sciences   |
|                                  | 72      | Épistémologie, histoire des sciences et des techniques - Epistemology, history of science and technology  |
| <b>Mathematics</b>               | 25      | Mathématiques - Mathematics   |
|                                  | 26      | Mathématiques appliquées et applications des mathématiques - Applied mathematics and mathematical applications  |
| <b>Computer Science</b>          | 27      | Informatique - Computer science   |
| <b>Physical Science</b>          | 28      | Milieux denses et matériaux - Dense media and materials   |
|                                  | 29      | Constituants élémentaires - Elementary constituents   |
|                                  | 30      | Milieux dilués et optique - Diluted media and optics  |
| <b>Chemical Science</b>          | 31      | Chimie théorique, physique, analytique - Theoretical, physical and analytical chemistry   |
|                                  | 32      | Chimie organique, minérale, industrielle - Organic, inorganic and industrial chemistry  |
|                                  | 33      | Chimie des matériaux - Materials chemistry  |
| <b>Earth Science</b>             | 34      | Astronomie, astrophysique - Astronomy, astrophysics   |
|                                  | 35      | Structure et évolution de la terre et des autres planètes - Structure and evolution of the Earth and other planets  |
|                                  | 36      | Terre solide : géodynamique des enveloppes supérieure, paléobiosphère - Solid Earth: geodynamics of the upper envelope  |
|                                  | 37      | Enveloppes fluides du système Terre et autres planètes - Fluid envelopes of the Earth system and other planets  |
| <b>Engineering</b>               | 60      | Mécanique, génie mécanique, génie civil - Mechanical engineering, civil engineering   |
|                                  | 61      | Génie informatique, automatique et traitement du signal - Computer engineering, automation and signal processing  |
|                                  | 62      | Energétique, génie des procédés - Energy and process engineering  |
|                                  | 63      | Génie électrique, électronique, photonique et systèmes - Electrical engineering, electronics, photonics and systems   |
| <b>Biological Science</b>        | 64      | Biochimie et biologie moléculaire - Biochemistry and molecular biology  |
|                                  | 65      | Biologie cellulaire - Cell Biology  |
|                                  | 66      | Physiologie - Physiology  |
|                                  | 67      | Biologie des populations et écologie - Population biology and ecology   |
|                                  | 68      | Biologie des organismes - Organismal biology  |
|                                  | 69      | Neurosciences - Neuroscience  |
| <b>Philosophy and Theology</b>   | 76      | Théologie catholique - Catholic theology  |
|                                  | 77      | Théologie protestante - Protestant theology   |
|                                  | 17      | Philosophie - Philosophy  |
| <b>Medical Science</b>           | 85      | Personnels enseignants-chercheurs de pharmacie en sciences physico-chimiques et ingénierie appliquée à la santé - Engineering applied to health   |
|                                  | 86      | Personnels enseignants-chercheurs de pharmacie en sciences du médicament et des autres produits de santé - Sciences of drugs and other health products  |
|                                  | 87      | Personnels enseignants-chercheurs de pharmacie en sciences biologiques, fondamentales et cliniques - Biological, fundamental and clinical sciences  |
|                                  | 90      | Maïeutique - Maieutics  |
|                                  | 91      | Personnels enseignants-chercheurs des disciplines des sciences de la rééducation et de réadaptation - Rehabilitation sciences   |
|                                  | 92      | Personnels enseignants-chercheurs des disciplines des sciences infirmières - Nursing  |
|                                  | 74      | Sciences et techniques des activités physiques et sportives - Sciences and techniques of physical activities and sports   |

Table B10: CNU Sections and Labels



## B.4 Description PhD Institution and Institution's Merge

| Code                        | University                   | Description                                  |
|-----------------------------|------------------------------|--|
| AGUY+ANTI+YANE*             | Antilles-Guyane              | ANTI and YANE since 2015                     |
| AIX1                        | Aix-Marseille 1              | See AIXM since 2012                          |
| AIX2                        | Aix-Marseille 2              | See AIXM since 2012                          |
| AIX3                        | Aix-Marseille 3              | See AIXM since 2012                          |
| AIXM                        | Aix-Marseille                | Creation 2012                                |
| AMIE                        | Amiens                       |  |
| ANGE                        | Angers                       |  |
| ANTI                        | Antilles                     | Creation 2015                                |
| ARTO                        | Artois                       |  |
| AVIG                        | Avignon                      |  |
| <b>AZUR</b> (=COAZ)**       | Univ. Côte d'Azur (ComUE)    | Creation 2016<br>then, changing code in 2020 |
| BELF                        | Belfort Montbéliard          | See UBFC since 2017                          |
| BESA                        | Besançon                     | See UBFC since 2017                          |
| BOR1 + BOR4***              | Bordeaux 1 + 4               | See BORD since 2014                          |
| BOR2                        | Bordeaux 2                   | See BORD since 2014                          |
| BOR3                        | Bordeaux 3                   | See BORD since 2014                          |
| BORD                        | Bordeaux                     | Creation 2014                                |
| BRES                        | Brest - Bretagne occidentale |  |
| CAEN                        | Caen                         | See NORM since 2017                          |
| <b>CERG</b> (=CYUN)         | Cergy-Pontoise               | Changing code CYUN in 2020                   |
| CHAM                        | Chambéry                     | See GREN since 2010                          |
| CLF1                        | Clermont-Ferrand 1           | See CLFA since 2021                          |
| CLF2                        | Clermont-Ferrand 2           | See CLFA since 2021                          |
| <b>CLFA</b> (=UCFA)         | Univ. Clermont Auvergne      | Changing code UCFA in 2020                   |
| COMP                        | Compiègne                    |  |
| CORT                        | Corte                        |  |
| DIJO                        | Dijon                        | See UBFC since 2017                          |
| DUNK                        | Littoral Dunkerque           |  |
| EVRY                        | Evry Val d'Essonne           | See SACL since 2015                          |
| GRAL                        | Univ. Grenoble Alpes         |  |
| GRE1                        | Grenoble 1                   | See GREN since 2010                          |
| GRE2                        | Grenoble 2                   | See GREN since 2010                          |
| GRE3                        | Grenoble 3                   | See GREN since 2010                          |
| <b>GREN</b> (=GRE A = GRAL) | Grenoble                     | Changing code in 2015, 2020                  |
| LARE                        | La Réunion                   |  |
| LARO                        | La Rochelle                  |  |
| LEHA                        | Le Havre                     | See NORM since 2017                          |
| LEMA                        | Le Mans                      |  |

Table B11: Universities

All the code of the universities associated with their name and the evolution of their code over the years. We focus on the period 1988 to 2021, any changes and code that appears before or after are taken into account. If the description is empty, it means that there is no change during the period. \* Guyane and Antilles were part of the same university at the beginning and then split, so we have to do only one university with all (because we don't know who was in which university); \*\* The sign equal, when the code name changed but represents the same university; \*\*\* BOR4 since 1995 for Law, Social Sciences and politics, Economics and Management theses), so we have to merge the two universities

| Code | University           | Description                                       |
|------|----------------------|---|
| LIL1 | Lille 1              | See LILU since 2018                               |
| LIL2 | Lille 2              | See LILU since 2018                               |
| LIL3 | Lille 3              | See LILU since 2018                               |
| LILU | Univ.polfLille       | Creation 2018                                     |
| LIMO | Limoges              |   |
| LORI | Lorient-Bretagne sud |   |
| LORR | Univ. de Lorraine    | Creation 2012                                     |
| LYO1 | Lyon 1               | See LYSE since 2015                               |
| LYO2 | Lyon 2               | See LYSE since 2015                               |
| LYO3 | Lyon 3               | See LYSE since 2015                               |
| LYSE | Lyon (COMUE)         | Creation 2015                                     |
| MARN | Marne la Vallée      | See PEST since 2008                               |
| METZ | Metz                 | See LORR since 2012                               |
| MON1 | Montpellier 1        | See MONT since 2015                               |
| MON2 | Montpellier 2        | See MONT since 2015                               |
| MON3 | Montpellier 3        |   |
| MONT | Montpellier          | Creation 2015                                     |
| MULH | Mulhouse             |   |
| NAN1 | Nancy 1              | See LORR since 2012                               |
| NAN2 | Nancy 2              | See LORR since 2012                               |
| NANT | Nantes               |   |
| NCAL | Nouvelle Calédonie   |   |
| NICE | Nice                 | See AZUR since 2016                               |
| NIME | Nîmes                |   |
| NORM | Normandie (COMUE)    | Creation 2017                                     |
| PA01 | Paris 1              |   |
| PA02 | Paris 2              |   |
| PA03 | Paris 3              | See USPC between 2015-2019                        |
| PA04 | Paris 4              | See SORU since 2018                               |
| PA05 | Paris 5              | See USPC between 2015-2019<br>See UNIP since 2019 |
| PA06 | Paris 6              | See SORU since 2018                               |
| PA07 | Paris 7              | See USPC between 2015-2019<br>See UNIP since 2019 |
| PA08 | Paris 8              |   |
| PA09 | Paris 9              | See PSLE since 2016                               |
| PA10 | Paris 10             |   |
| PA11 | Paris 11             | See SACL since 2015                               |
| PA12 | Paris 12             | See PEST between 2008-2020                        |
| PA13 | Paris 13             | See USPC between 2015-2019                        |

Table B12: Universities

All the code of the universities associated with their name and the evolution of their code over the years. We focus on the period 1988 to 2021, any changes and code that appears before or after are taken into account. If the description is empty, it means that there is no change during the period. \* Nouvelle Calédonie and Polynésie française were part of the same university at the beginning and then split, so we have to use only one code with both as we can't distinguish them. \*\* PEST changed its name in 2015 to PESC

| Code                                   | University                                     | Description                  |
|--|--|------------------------------|
| <b>PACI</b><br>+NCAL+POLF*             | Pacifique                                      | See NCAL and POLF since 1999 |
| PAUU                                   | Pau  |                              |
| PERP                                   | Perpignan                                      |                              |
| <b>PEST</b> (=PESC)**                  | Paris Est (COMUE)                              |                              |
| POIT                                   | Poitiers                                       |                              |
| POLF                                   | Polynésie française                            |                              |
| REIM                                   | Reims  |                              |
| REN1                                   | Rennes 1                                       |                              |
| REN2                                   | Rennes 2                                       |                              |
| ROUE                                   | Rouen  |                              |
| <b>SACL</b> +UPAS<br>+IPPA+IAVF*       | Univ. Paris-Saclay (ComUE)                     | Creation in 2015             |
| SORU                                   | Sorbonne Univ.                                 |                              |
| STET                                   | Saint-Etienne                                  | See LYSE since 2015          |
| STR1                                   | Strasbourg 1                                   | See STRA since 2009          |
| STR2                                   | Strasbourg 2                                   | See STRA since 2009          |
| STR3                                   | Strasbourg 3                                   | See STRA since 2009          |
| STRA                                   | Strasbourg                                     | Creation 2009                |
| TOU1                                   | Toulouse 1                                     |                              |
| TOU2                                   | Toulouse 2                                     |                              |
| TOU3                                   | Toulouse 3-Ec. nationale vétérinaire           |                              |
| TOUL                                   | Toulon   |                              |
| TOUR                                   | Tours  |                              |
| TROY                                   | Troyes   |                              |
| UBFC                                   | Bourgogne Franche-Comté                        | Creation 2017                |
| UCFA                                   | Univ. Clermont-Auvergne                        |                              |
| UEFL                                   | Univ. Gustave Eiffel                           |                              |
| UNIP                                   | Univ. de Paris                                 | Creation 2019                |
| UPHF                                   | Univ. Polytech. Hauts-de-France - Valenciennes |                              |
| <b>USPC</b> +PA03+PA13<br>+INAL+UNIP** | Sorbonne Paris Cité                            | Creation in 2019             |
| VALE                                   | Valenciennes                                   | See UPHF since 2019          |
| VERS                                   | Versailles St Quentin en Yvelines              | See SACL since 2015          |
| YANE                                   | Guyane   | Creation 2015                |

Table B13: Universities

All the code of the universities associated with their name and the evolution of their code over the years. We focus on the period 1988 to 2021, any changes and code that appears before or after are taken into account. If the description is empty, it means that there is no change during the period. \* IAVF is a new branch in 2016 and SACL was divided into UPAS and IPPA in 2019, as we can't distinguish, we use the same code for the three. \*\* There is a merge and then a split of universities, so we use one code for PA03, PA13, INAL, and UNIP only after 2019.

| Code | Institute                                  | Description         |
|------|--|---------------------|
| INPG | Institut national polytechnique - Grenoble | See GREN since 2009 |
| INPL | Institut national polytechnique - Lorraine |                     |
| INPT | Institut national polytechnique - Toulouse |                     |
| IPPA | Institut Polytechnique de Paris            |                     |

Table B14: National Institute of Polytechnics

All the code of the universities associated with their name and the evolution of their code over the years. We focus on the period 1988 to 2021, any changes and code that appears before or after are taken into account. If the description is empty, it means that there is no change during the period.



| Code                             | Establishment   | Description          |
|----------------------------------|---|----------------------|
| <b>AGPT</b> +EIAA<br>+ENGR+INAP* | AgroParisTech   | See SACL since 2015  |
| CLIL                             | Centrale Lille Institut   |                      |
| CNAM                             | Conservatoire national des arts et métiers                                  |                      |
| CSUP                             | CentraleSupélec   | See SACL since 2015  |
| DENS                             | Ec. normale supérieure - Cachan   | See SACL since 2015  |
| ECAP                             | Ec. centrale des arts et manufactures de Paris                              | See SACL since 2015  |
| ECDL                             | Ec. centrale de Lyon  | See LYSE since 2015  |
| ECDM                             | Ec. centrale de Marseille   |                      |
| ECDN                             | Ec. centrale de Nantes  | See CLIL since 2020  |
| ECLI                             | Ec. centrale de Lille   | See CLIL since 2020  |
| EHEC                             | Ec. des hautes études commerciales  | See SACL since 2015  |
| EHES                             | Ec. des hautes études en sciences sociales                                  |                      |
| EIAA                             | Ec. nationale supérieure des industries alimentaires - Massy                | See AGPT since 2007- |
| EMAC                             | Ec. nationale des Mines d'Albi-Carmaux                                      |                      |
| EMAL                             | IMT Mines Alès  |                      |
| EMNA                             | Ec. des Mines de Nantes   | See IMTA since 2017  |
| EMSE                             | Ec. nationale supérieure des Mines - Saint-Etienne                          |                      |
| ENAM                             | Ec. nationale supérieure d'arts et métiers                                  | See HESA since 2020  |
| ENCM                             | Ec. nationale supérieure de chimie de Montpellier                           |                      |
| ENCP                             | Ec. nationale des chartes   |                      |
| ENCR                             | Ec. nationale supérieure de chimie de Rennes                                |                      |
| ENGR                             | Ec. nationale du génie rural, des eaux et forêts                            | See AGPT since 2007  |
| ENIB                             | Ec. nationale d'ingénieurs de Brest   |                      |
| ENIS                             | Ec. nationale d'ingénieurs de Saint-Etienne                                 | See LYSE since 2015  |
| ENMP                             | Ec. nationale supérieure des Mines - Paris                                  | See PSLE since 2016  |
| ENPC                             | Ec. nationale des ponts et chaussées  | See PEST since 2008  |
| ENSL                             | Ec. normale supérieure (sciences) - Lyon                                    | See LYSE since 2015  |
| ENSR                             | Ec. normale supérieure de Rennes  |                      |
| ENST                             | Ec. nationale supérieure des télécommunications                             | See SACL since 2015  |
| ENSU                             | Ec. normale supérieure- Paris (rue d'Ulm)                                   | See PSLE since 2016  |
| ENTA                             | Ec. nationale supérieure de techniques avancées Bretagne                    |                      |
| ENTP                             | Ec. nationale des travaux publics   | See LYSE since 2015  |
| EPHE                             | Ec. pratique des hautes études  | See PSLE since 2016  |
| EPXX                             | Ec. polytechnique   | See SACL since 2015  |
| ESAE                             | ISAE  |                      |
| ESEC                             | Ec. supérieure des sciences économiques et commerciales                     |                      |
| ESMA                             | Ec. nationale supérieure de mécanique et d'aérotechnique                    |                      |
| ESTA                             | Ec. nationale supérieure de techniques avancées                             | See SACL since 2015  |
| GLOB                             | Institut de physique du Globe   | See USPC since 2015  |
| HESA                             | HESAM   |                      |
| IAVF                             | Institut agronomique, vétérinaire et forestier de France - Paris            |                      |
| IEPP                             | Institut d'études politiques - Paris  |                      |
| IMTA                             | Ec. nationale supérieure Mines-Télécom Atlantique Bretagne Pays de la Loire |                      |
| INAL                             | Institut national des langues et civilisations orientales (INALCO)          | See USPC since 2015  |
| INAP                             | Institut national d'agronomie - Paris Grignon                               | See AGPT since 2007  |
| IOTA                             | Institut d'optique théorique et appliquée - Palaiseau                       | SACL UPAS            |
| ISAB                             | Institut national des sciences appliquées Val de Loire - Bourges            |                      |
| ISAL                             | Institut national des sciences appliquées - Lyon                            | See LYSE since 2015  |
| ISAM                             | Institut national des sciences appliquées - Rouen                           | See NORM since 2017  |
| ISAR                             | Institut national des sciences appliquées - Rennes                          |                      |
| ISAT                             | Institut national des sciences appliquées - Toulouse                        |                      |
| MNHN                             | Museum d'histoire naturelle   |                      |
| MTLD                             | Ec. nationale supérieure Mines-Télécom Lille Douai                          |                      |
| NSAI                             | Ec. nationale de la Statistique et de l'Analyse de l'Information - Rennes   |                      |
| NSAM                             | SupAgro - Montpellier   |                      |
| NSAR                             | Agrocampus Ouest - Rennes   |                      |
| OBSP                             | Observatoire de Paris   | See PSLE since 2016  |
| ONIR                             | Ec. nationale vétérinaire - Nantes  |                      |
| ORLE                             |   |                      |
| <b>PSLE</b> (=UPSL)              | Paris Sciences et Lettres (ComUE)   | Creation 2016        |
| TELB                             | Ec. nationale supérieure des TelecompolBretagne - Brest                     | See IMTA since 2017  |
| TELE                             | Institut national des télécommunications                                    | See SACL since 2015  |

Table B15: Higher Education Establishment

All the code of the universities associated with their name and the evolution of their code over the years. We focus on the period 1988 to 2021, any changes and code that appears before or after are taken into account. If the description is empty, it means that there is no change during the period. \* EIAA+ENGR+INAP merged to become AGPT in 2007 we use one code

for the three. \*\* Change code in 2020

## C Methodology

### C.1 Decomposition Method

The progression from PhD to permanent position involves three sequential transitions: (1.a) Application for qualification after PhD ( $AQ$ ), (1.b) Qualification success conditional on applying ( $Q|AQ$ ), and (2) Secure a permanent position conditional on qualification ( $JP|Q$ ).

The unconditional probability of securing a permanent position can be expressed as the product of these three conditional probabilities:

$$Pr(S) = Pr(AQ) \times Pr(Q|AQ) \times Pr(JP|Q) \quad (7)$$

The gender gap in this unconditional probability is:

$$\Delta Pr(S) = Pr(S; m) - Pr(S; f) \quad (8)$$

where  $m$  and  $f$  denote men and women. This can be expanded as:

$$\begin{aligned} \Delta Pr(S) = & Pr(AQ; m) \times Pr(Q|AQ; m) \times Pr(JP|Q; m) \\ & - Pr(AQ; f) \times Pr(Q|AQ; f) \times Pr(JP|Q; f) \end{aligned} \quad (9)$$

For each stage, I decompose the contribution to the overall gender gap into application and success. For example, for the first transition (PhD to qualification), the gap between obtaining qualification and not can be decomposed as:

$$\Delta Pr(Q) = \overline{Pr(Q|AQ)} \times \Delta Pr(AQ) + \overline{Pr(AQ)} \times \Delta Pr(Q|AQ) \quad (10)$$

Where  $\overline{Pr(Q|AQ)}$  and  $\overline{Pr(AQ)}$  are the average probabilities across genders<sup>13</sup>.

Similarly, I can identify the contribution of each transition to the overall gender gap. For example, the contribution of the application for the qualification stage can be expressed as:

$$\text{Contribution of } AQ = \overline{Pr(Q|AQ)} \times \overline{Pr(JP|Q)} \times \Delta Pr(AQ) \quad (11)$$

This approach allows me to determine whether gender gaps arise primarily from differences in application behavior or from differences in success rates, and to quantify

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<sup>13</sup>  $\overline{Pr(X)} = \frac{Pr(X; m) + Pr(X; f)}{2}$

what percentAge of the overall gender gap is attributable to each specific transition in the academic pipeline.

### Linear probability regression model:

To estimate the conditional probability of success of individual  $i$  at time  $t$ , PhD graduates from university  $u$ , in field  $f$  at each transition stage, I follow the methodology of [Bosquet et al. \(2019\)](#) and use a linear probability model for all probabilities. My empirical analysis considers four sequential transitions in the academic career path: (1.a) Application for qualification after PhD ( $AQ$ ), (1.b) Qualification success conditional on applying ( $Q|AQ$ ), (2) Secure a junior permanent position conditional on qualification ( $JP|Q$ ). For an outcome  $O$  where  $O \in \{AQ; Q|AQ; JP|Q\}$ , I estimate:

$$\begin{aligned} \Pr(O)_{ituf} = & \beta_0 + \beta_1 \text{Female}_i + \beta_2 \text{Time since PhD}_{it} + \beta_3 \text{Time since PhD}_{it}^2 \\ & + \beta_4 \text{Publish}_{it} + \beta_5 (\text{Publish} \times \text{Quantity})_{it} + \beta_6 (\text{Publish} \times \text{Quality})_{it} \\ & + \beta_7 \text{Female Supervisor}_i + \beta_8 \text{Quality\_supervisor}_i + \alpha_{uf} + \gamma_t + \epsilon_{ituf} \quad (12) \end{aligned}$$

The outcome is a function of experience since PhD graduation ( $\text{TimesincePhD}_{it}$ ) and its square, whether individual  $i$  has at least one scientific publication appearing in the *Scopus platform* (dummy  $\text{Publish}_{it}$ ), the cumulative number of publications at year  $t$  ( $\text{Quantity}_{it}$ ) and the cumulative Article Influence Score (AIS) of publications at year  $t$  ( $\text{Quality}_{it}$ ), and supervisor characteristics including whether at least one supervisor is female ( $\text{FemaleSupervisor}$ ) and the cumulative AIS score of supervisors at the year of PhD defense of individual  $i$  ( $\text{Quality\_supervisor}_i$ ).  $\text{Female}_i$  is a dummy variable equal to 1 if the PhD graduate is female and 0 if male;  $\beta_1$  measures the gender differences in probability for individuals with the same characteristics.  $\gamma_t$  are year fixed effects that capture time-specific trends in a non-parametric manner.  $\alpha_{uf}$  are university-field fixed effects that control for local factors affecting PhD graduates' academic productivity, such as departments' social capital and academic quality.

## C.2 Data theses.fr - Detailed Procedure

We construct our dataset using data from *Theses.fr*, which provides records of all PhD theses defended in French universities between 1988 and 2021. *Theses.fr* is a centralized public platform that systematically compiles data from university catalogs across France, sourced through library and documentation services within higher education and research institutions, establishing it as the most comprehensive and reliable platform for French

PhD graduation.

The dataset is not immune to limitations. Data entry occurs manually at various stages, which introduces the potential for spelling inconsistencies. Furthermore, certain theses may go unreported due to a lack of submission by graduates, loss, or failure to meet quality control standards, which we estimate affects approximately 5% of theses each year. In addition, the processing of records is time-intensive, making the data for 2022 potentially incomplete. Additionally, an observed scarcity of records prior to 1988 suggests further underreporting. Consequently, we restrict our sample to the period from 1988 to 2021.

From an initial sample of 407,260 theses recorded between 1988 and 2021, we impose a series of exclusions to ensure data reliability. Theses supervised by more than two advisors—constituting roughly 2% of the dataset—are excluded, yielding a refined dataset of 399,118 observations. Additional filters are applied to exclude records with incomplete names for PhD candidates or supervisors, as well as cases with missing discipline information, resulting in a final dataset of 397,536 theses. At this stage, we exclude theses in medicine due to reliability concerns, which we discuss in detail in Section C.2.2, leaving a total of 340,073 observations.

For each thesis, we gathered information on the research discipline, defense year, university affiliation, and full names of the PhD student and supervisor(s). In the sections that follow, we detail the data-cleaning procedures applied to discipline and university affiliation, explain the exclusion of health and medical sciences, and outline our methodology for associating gender with first names.

### C.2.1 Gender association

In this study, we determine the gender of both PhD students and supervisors based on first names. Our primary source is the INSEE database, which compiles first names assigned in France from 1900 to 2020, including the gender distribution for each name over the period 1940-2020. We focus on this range, assuming that the majority of PhD students in our dataset were born after 1940. For names associated with both genders, we establish a reliable gender ratio and retain only those names where one gender represents at least 95% of total occurrences; names below this threshold are treated as indeterminate. This process allows us to identify the gender for 305,187 out of 340,073 PhD student first names. Recognizing the limitations posed by foreign names, we supplement INSEE data with governmental databases from Australia, Canada, Spain, Sweden, the UK, and the US.

Through additional data collection from these international sources, we resolve the gender of an additional 9,246 PhD students. We further employ the methodology of

Benveniste (2023), which classifies names based on the last two letters and the associated gender probability, allowing us to identify the gender of 3,004 more PhD students. In total, we successfully identify the gender of 317,437 doctoral students, covering 93% of the sample. Of the remaining 7%, 3% (8,166 names) represent names used by both genders without a clear distributional majority (e.g., Camille, Claude). Using the same approach, we successfully associate a gender for 95% of PhD supervisors.

### C.2.2 Disciplines

The categorization of discipline fields in *Thèses.fr* is imprecise, partly due to manual data entry. The database originally contained around 22,000 unique entries for the discipline variable, which we grouped into twenty-two subcategories and further into four broader categories based on the Australian and New Zealand Standard Research Classification (ANZSRC). To classify these entries, we adopted a keyword-based approach, manually associating each entry with relevant discipline categories. We began by filtering with specific keywords unique to each category, as illustrated in the following examples:

Example

“CHIMIE ORGANIQUE” for “Chemical Sciences”

“INFORMATIQUE” for “Information, computing and Communication Sciences”

“SCIENCES BIOLOGIQUES” for “Biological Sciences” ...

Following this, we applied progressively broader keywords, carefully verifying that each association was accurate to avoid misclassification. For example, general keywords like “MAGNETISME,” “LANGUES,” and “VEGETAL” were used, corresponding to “Physical Sciences,” “Language and Culture,” and “Biological Sciences,” respectively.

In cases of ambiguous or unknown disciplines, we examined thesis titles and applied the same keyword methodology. Despite these efforts, discipline association may still contain errors, especially for multidisciplinary theses that we must assign to a single category. To account for this, we created four overarching categories to group similar subjects: Humanities and Law, Biological and Earth Sciences, Sciences, Technology and Engineering, and Social Sciences.

**Drop Health and Medical Sciences discipline.** In this section, we discuss the unreliability of Health and Medical Sciences thesis data prior to the 2000s. Our analysis identified notable irregularities in medical theses data, particularly around 1994. We traced the origin of these discrepancies to the data selection mechanism in *Thèses.fr*, which automatically selects defended doctoral theses and excludes documents not categorized as such. However, in the French health sciences domain, “*thèses d’exercice*”

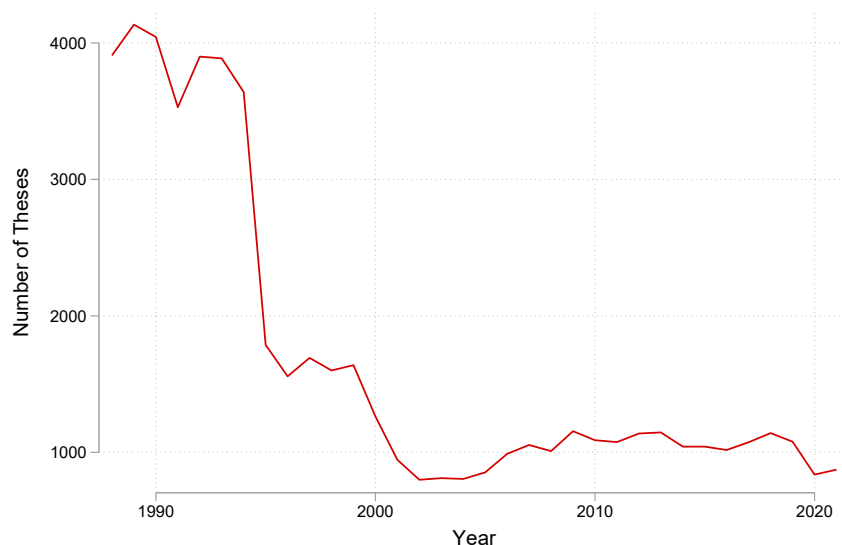


Figure C9: Number of Thesis by Year of Defense in Health and Medical Sciences

- theses defended to obtain a State Diploma of Doctor required for medical practice—are often included. These are distinct from doctoral theses intended to confer the national diploma of doctor (*diplôme national de doctorat*). Unfortunately, during data import into *Thèses.fr*, a substantial number of *thèses d'exercice* were incorrectly labeled as doctoral theses, introducing bias.

Figure C9 displays the number of theses defended in health and medical sciences since 1988, showing that institutions began systematically distinguishing between doctoral theses and *thèses d'exercice* around the early 2000s. As we aim to focus on theses from before 2000, we must exclude medical theses from our sample to avoid biasing our study.

### C.2.3 University

In recent years, French universities have been undergoing a series of institutional mergers, intended to enhance their international visibility and competitiveness<sup>14</sup>. To ensure consistency in our analysis, we standardized university codes following the documentation provided by *Thèses.fr*<sup>15</sup> and tracked changes in institutional names over time. Between 2007 and 2020, 26 new universities were established through the consolidation of 76 existing institutions. For example, in 2013, Aix-Marseille University was formed by merging Aix-Marseille 1, Aix-Marseille 2, and Aix-Marseille 3.

In certain cases, however, institutions have subsequently split, complicating the distinction between former codes. In such instances, it is more practical to apply a

<sup>14</sup><https://www.enseignementsup-recherche.gouv.fr/fr/premier-bilan-des-fusions-d-universites-realisees-entre-2009-et-2017-47515>

<sup>15</sup><https://documentation.abes.fr/guide/html/regles/CodesUnivEtab.htm>

single code for universities that have separated, even at the cost of some specificity. For example, the University of Paris-Saclay was initially formed in 2015 as a merger of 11 institutions, only to divide into two distinct entities by the end of 2019.

Table B11, B12, and B13 provide a detailed list of all universities and their coding changes, while Table B14 covers the National Institutes of Polytechnics, and Table B15 presents the Higher Education Establishments. Each institution is listed with its associated code and any historical coding changes from 1988 to 2021. Any changes or codes appearing before or after this period are not documented. A blank description indicates no changes during the specified timeframe.

### C.3 Construction of the Commuting Time Variable

To complement great-circle distance as a measure of geographic frictions, I construct a variable for estimated commuting time between the PhD institution and the job location. This variable is designed to better capture realistic travel costs faced by candidates, accounting for transportation infrastructure and regional accessibility.

The commuting time is computed in several steps:

1. **Train-based commuting time.** I merge the dyadic dataset with an external dataset containing average train travel times between French cities, using information from the French national railway open data platform ([data.sncf.com](https://data.sncf.com)). The merge is based on year and city-to-city routes (e.g., “Lyon–Paris”).
2. **Special adjustments for the Paris region.** For movements within the Île-de-France region, where suburban candidates frequently commute to central Paris, I assign a default value of 60 minutes, reflecting typical intra-regional commuting durations. This value is applied to both directions (from/to Paris). In a second step, I redefine all cities within Île-de-France as “Paris” to capture additional matches in the train time dataset. I re-merge the data and add 60 minutes to the retrieved travel time to account for average commuting from the broader metropolitan area.
3. **Fallback proxy using road travel time.** For remaining unmatched observations, I impute commuting time using a road-based proxy derived from great-circle distance. Assuming a speed of 90 km/h and inflating the straight-line distance by a factor of 1.2, I approximate round-trip travel time as follows:

$$\text{Commuting Time (min)} = 2 \times \left( \frac{1.2 \times \text{Distance (km)}}{90} \right) \times 60$$

This provides a conservative estimate of round-trip driving time.



## D Robustness

### D.1 Candidate-Job Dyads Level Application Behavior

Table [D16](#): Application Patterns by Candidate-Job Dyads - Distance in km

Table [D17](#): Application Patterns by Candidate-Job Dyads - Commuting Time

Table [D18](#): Application Patterns by Candidate-Job Dyads - controls: age at PhD and time since graduation

Table [D19](#): Application Patterns by Candidate-Job Dyads - Excluding Paris candidates

Table [D20](#): Application Patterns by Candidate-Job Dyads - Subsamples Based on Application Timing

Table [D21](#): Application Patterns by Candidate-Job Dyads - Heterogeneity by Field

Table [D22](#): Application Patterns by Candidate-Job Dyads - Heterogeneity Analysis

### D.2 Individual-level Application Behavior

Table [D23](#): Gender Differences in Application Patterns by Distance to Job Offers - Pseudo-Maximum Likelihood

Table [D24](#): Application Patterns by Commuting Time to Job Offers

Table [D25](#): Application Patterns by Distance to Job Offers Controlling for age at PhD graduation and time since PhD graduation

Table [D26](#): Application Patterns by Distance to Job Offers - Excluding Paris

Table [D27](#): Application Patterns by Distance to Job Offers - subsamples based on application timing

Table [D28](#): Application Patterns by Distance to Job Offers – by Field

Table [D29](#): Application Patterns by Geography of Job Offers – Same City vs Same Region

## D.1 Candidate-Job Dyads Level Application Behavior

Table D16: Application Patterns by Candidate-Job Dyads - Distance in km

|                               | (1)   | (2)                                | (3)   |
|-------------------------------|---|------------------------------------|---|
| Dependent variable:           | <i>Apply to position</i>                        |                                    |   |
| Female                        | 0.00197<br>(0.00183)                            | -0.00277<br>(0.00203)              | -<br>-  |
| Distance (km)                 | -0.0000748***<br>(0.00000199)                   | -<br>-                             | -0.0000744***<br>(0.00000186)                   |
| Distance (km) $\times$ Female | -0.0000206***<br>(0.00000294)                   | -0.00000749**<br>(0.00000379)      | -0.0000216***<br>(0.00000259)                   |
| Adj $R^2$                     | 0.19  | 0.20                               | 0.30  |
| Controls                      | yes   | yes                                | yes   |
| Fixed effects                 | $U_i \times t \times f + U_j \times t \times f$ | $U_i \times U_j \times t \times f$ | $i \times (t \times f) + j \times (t \times f)$ |
| Observations                  | 2,287,422                                       | 2,162,136                          | 2,286,953                                       |

*Notes:* *Apply* is a binary variable equal to 1 if the candidate applied to a specific job. Each observation represents a dyad between a candidate and a potential job opening. *Distance* is the geographical distance between the job and the candidate's PhD institution. All regressions include controls for age, publication metrics, and supervisor gender. Fixed effects vary across specifications and are indicated in the "Fixed effects" row:  $U_i$  denotes the university of candidate  $i$ ,  $U_j$  the university of the job  $j$ ,  $t$  the year, and  $f$  the field.  $i$  and  $j$  denote candidate and job identifiers, respectively. Standard errors are clustered by Discipline X Candidate Univ X Year. Significance levels are defined as follows: \*  $p < 0.10$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$ .

Table D17: Application Patterns by Candidate-Job Dyads - Commuting Time

|                                      | (1)   | (2)                                | (3)   |
|--------------------------------------|---|------------------------------------|---|
| Dependent variable:                  | <i>Apply to position</i>                        |                                    |   |
| Female                               | 0.00123<br>(0.00178)                            | -0.00292<br>(0.00195)              | -<br>-  |
| Commuting time (min)                 | -0.000127***<br>(0.00000364)                    | -<br>-                             | -0.000124***<br>(0.00000333)                    |
| Commuting time (min) $\times$ Female | -0.0000346***<br>(0.00000517)                   | -0.0000132**<br>(0.00000662)       | -0.0000429***<br>(0.00000413)                   |
| Adj $R^2$                            | 0.19  | 0.20                               | 0.30  |
| Controls                             | yes   | yes                                | yes   |
| Fixed effects                        | $U_i \times t \times f + U_j \times t \times f$ | $U_i \times U_j \times t \times f$ | $i \times (t \times f) + j \times (t \times f)$ |
| Observations                         | 2,287,422                                       | 2,162,136                          | 2,286,968                                       |

*Notes:* *Apply* is a binary variable equal to 1 if the candidate applied to a specific job. Each observation represents a dyad between a candidate and a potential job opening. *Commuting time* combines train travel time (from official SNCF timetables), road travel time (based on routing algorithms), and AI-based predictions for less connected pairs. Details of the construction are provided in Appendix Section C.3@. between the job and the candidate's PhD institution. All regressions include controls for age, publication metrics, and supervisor gender. Fixed effects vary across specifications and are indicated in the "Fixed effects" row:  $U_i$  denotes the university of candidate  $i$ ,  $U_j$  the university of the job  $j$ ,  $t$  the year, and  $f$  the field.  $i$  and  $j$  denote candidate and job identifiers, respectively. Standard errors are clustered by Discipline X Candidate Univ X Year. Significance levels are defined as follows: \*  $p < 0.10$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$ .

Table D18: Application Patterns by Candidate-Job Dyads - controls: age at PhD and time since graduation

|   | (1)   | (2)                                |
|---|---|------------------------------------|
| Dependent variable:                         | <i>Apply to position</i>                        |                                    |
| Female                                      | 0.00710**<br>(0.00279)                          | 0.000582<br>(0.00323)              |
| $\ln(\text{Distance})$                      | -0.0127***<br>(0.000319)                        | -<br>-                             |
| $\ln(\text{Distance}) \times \text{Female}$ | -0.00236***<br>(0.000439)                       | -0.00113**<br>(0.000533)           |
| Adj $R^2$                                   | 0.19  | 0.20                               |
| Controls                                    | yes   | yes                                |
| Fixed effects                               | $U_i \times t \times f + U_j \times t \times f$ | $U_i \times U_j \times t \times f$ |
| Observations                                | 2,287,422                                       | 2,162,136                          |

*Notes:* *Apply* is a binary variable equal to 1 if the candidate applied to a specific job. Each observation represents a dyad between a candidate and a potential job opening.  $\ln(\text{Distance})$  is the logarithm of the geographical distance between the job and the candidate's PhD institution. All regressions include controls for age, publication metrics, and supervisor gender. Fixed effects vary across specifications and are indicated in the "Fixed effects" row:  $U_i$  denotes the university of candidate  $i$ ,  $U_j$  the university of the job  $j$ ,  $t$  the year, and  $f$  the field.  $i$  and  $j$  denote candidate and job identifiers, respectively. Standard errors are clustered by Discipline X Candidate Univ X Year. Significance levels are defined as follows: \*  $p < 0.10$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$ .

Table D19: Application Patterns by Candidate-Job Dyads - Excluding Paris candidates

|   | (1)   | (2)                                | (3)   |
|---|---|------------------------------------|---|
| Dependent variable:                         | <i>Apply to position</i>                        |                                    |   |
| Female                                      | 0.0208***<br>(0.00436)                          | 0.000107<br>(0.00510)              | -<br>-  |
| $\ln(\text{Distance})$                      | -0.0154***<br>(0.000409)                        | -<br>-                             | -0.0153***<br>(0.000397)                        |
| $\ln(\text{Distance}) \times \text{Female}$ | -0.00482***<br>(0.000686)                       | -0.00118<br>(0.000837)             | -0.00513***<br>(0.000651)                       |
| Adj $R^2$                                   | 0.20  | 0.21                               | 0.30  |
| Controls                                    | yes   | yes                                | yes   |
| Fixed effects                               | $U_i \times t \times f + U_j \times t \times f$ | $U_i \times U_j \times t \times f$ | $i \times (t \times f) + j \times (t \times f)$ |
| Observations                                | 1,576,906                                       | 1,470,253                          | 1,576,684                                       |

*Notes:* *Apply* is a binary variable equal to 1 if the candidate applied to a specific job. Each observation represents a dyad between a candidate and a potential job opening.  $\ln(\text{Distance})$  is the logarithm of the geographical distance between the job and the candidate's PhD institution. All regressions include controls for age, publication metrics, and supervisor gender. Fixed effects vary across specifications and are indicated in the "Fixed effects" row:  $U_i$  denotes the university of candidate  $i$ ,  $U_j$  the university of the job  $j$ ,  $t$  the year, and  $f$  the field.  $i$  and  $j$  denote candidate and job identifiers, respectively. Qualified candidates from Paris are excluded. Standard errors are clustered by Discipline X Candidate Univ X Year. Significance levels are defined as follows: \*  $p < 0.10$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$ .

Table D20: Application Patterns by Candidate-Job Dyads - Subsamples Based on Application Timing

|  | (1)   | (2)                                | (3)   |
|--|---|------------------------------------|---|
|  | Apply to position                               |                                    |   |
| Panel A: Candidates who applied at least once in their career  |   |                                    |   |
| Female   | 0.00771**<br>(0.00334)                          | 0.00174<br>(0.00390)               | -<br>-  |
| ln(Distance)   | -0.0171***<br>(0.00040)                         | -<br>-                             | -0.0172***<br>(0.00039)                         |
| ln(Distance) × Female  | -0.00255***<br>(0.00054)                        | -0.00139**<br>(0.00066)            | -0.00249***<br>(0.00050)                        |
| Adj R <sup>2</sup>   | 0.20  | 0.20                               | 0.30  |
| Observations   | 1,726,884                                       | 1,601,520                          | 1,726,649                                       |
| Panel B: Candidates who applied in year of first qualification |   |                                    |   |
| Female   | 0.00692*<br>(0.00371)                           | 0.00111<br>(0.00438)               | -<br>-  |
| ln(Distance)   | -0.0214***<br>(0.00048)                         | -<br>-                             | -0.0214***<br>(0.00047)                         |
| ln(Distance) × Female  | -0.00246***<br>(0.00062)                        | -0.00132*<br>(0.00078)             | -0.00263***<br>(0.00060)                        |
| Adj R <sup>2</sup>   | 0.20  | 0.21                               | 0.28  |
| Observations   | 1,390,720                                       | 1,272,226                          | 1,390,599                                       |
| Panel C: Second year after qualification                       |   |                                    |   |
| Female   | 0.00391<br>(0.00252)                            | 0.00196<br>(0.00294)               | -<br>-  |
| ln(Distance)   | -0.00677***<br>(0.00023)                        | -<br>-                             | -0.00687***<br>(0.00021)                        |
| ln(Distance) × Female  | -0.00157***<br>(0.00037)                        | -0.00118***<br>(0.00045)           | -0.00133***<br>(0.00030)                        |
| Adj R <sup>2</sup>   | 0.147   | 0.132                              | 0.297   |
| Observations   | 2,021,493                                       | 1,907,890                          | 2,020,987                                       |
| Panel D: Third year after qualification                        |   |                                    |   |
| Female   | 0.00109<br>(0.00209)                            | -0.00035<br>(0.00249)              | -<br>-  |
| ln(Distance)   | -0.00435***<br>(0.00019)                        | -<br>-                             | -0.00432***<br>(0.00018)                        |
| ln(Distance) × Female  | -0.00091***<br>(0.00031)                        | -0.00062<br>(0.00040)              | -0.00098***<br>(0.00025)                        |
| Adj R <sup>2</sup>   | 0.120   | 0.102                              | 0.273   |
| Observations   | 1,764,522                                       | 1,662,447                          | 1,764,043                                       |
| Panel E: Fourth year after qualification                       |   |                                    |   |
| Female   | -0.00006<br>(0.00165)                           | -0.00306<br>(0.00194)              | -<br>-  |
| ln(Distance)   | -0.00289***<br>(0.00016)                        | -<br>-                             | -0.00281***<br>(0.00015)                        |
| ln(Distance) × Female  | -0.00043*<br>(0.00024)                          | 0.00015<br>(0.00030)               | -0.00061***<br>(0.00021)                        |
| Adj R <sup>2</sup>   | 0.099   | 0.076                              | 0.248   |
| Observations   | 1,524,331                                       | 1,434,473                          | 1,523,912                                       |
| Controls   | yes   | yes                                | yes   |
| Fixed effects  | $U_i \times t \times f + U_j \times t \times f$ | $U_i \times U_j \times t \times f$ | $i \times (t \times f) + j \times (t \times f)$ |

*Notes:* *Apply* is a binary variable equal to 1 if the candidate applied to a specific job. Each observation represents a dyad between a candidate and a potential job opening.  $\ln(\text{Distance})$  is the logarithm of the geographical distance between the job and the candidate's PhD institution. All regressions include controls for age, publication metrics, and supervisor gender. Fixed effects vary across specifications and are indicated above. Standard errors are clustered by Discipline  $\times$  Candidate Univ  $\times$  Year. Significance levels: \*  $p < 0.10$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$ .

Table D21: Application Patterns by Candidate-Job Dyads - Heterogeneity by Field

|   | (1)   | (2)                                | (3)   |
|---|---|------------------------------------|---|
|   | Apply to position                               |                                    |   |
| Panel A: Qualified in biological and earth sciences |   |                                    |   |
| Female  | 0.00039<br>(0.00401)                            | 0.00079<br>(0.00464)               | -<br>-  |
| ln(Distance)  | -0.00790***<br>(0.00055)                        | -<br>-                             | -0.00788***<br>(0.00057)                        |
| ln(Distance) × Female                               | -0.00058<br>(0.00066)                           | -0.00062<br>(0.00077)              | -0.00062<br>(0.00068)                           |
| Adj $R^2$   | 0.08  | 0.09                               | 0.13  |
| Observations  | 245,228   | 220,687                            | 244,527   |
| Panel B: Qualified in humanities                    |   |                                    |   |
| Female  | -0.00468<br>(0.00385)                           | -0.00687<br>(0.00429)              | -<br>-  |
| ln(Distance)  | -0.0121***<br>(0.00056)                         | -<br>-                             | -0.0122***<br>(0.00054)                         |
| ln(Distance) × Female                               | -0.00071<br>(0.00062)                           | -0.00020<br>(0.00072)              | -0.00054<br>(0.00060)                           |
| Adj $R^2$   | 0.09  | 0.09                               | 0.18  |
| Observations  | 611,387   | 569,559                            | 609,639   |
| Panel C: Qualified in STEM                          |   |                                    |   |
| Female  | 0.00999**<br>(0.00465)                          | 0.00701<br>(0.00543)               | -<br>-  |
| ln(Distance)  | -0.0100***<br>(0.00036)                         | -<br>-                             | -0.00998***<br>(0.00035)                        |
| ln(Distance) × Female                               | -0.00211***<br>(0.00074)                        | -0.00157*<br>(0.00089)             | -0.00223***<br>(0.00064)                        |
| Adj $R^2$   | 0.10  | 0.10                               | 0.21  |
| Observations  | 1,045,478                                       | 987,343                            | 1,044,110                                       |
| Panel D: Qualified in social sciences               |   |                                    |   |
| Female  | 0.0128<br>(0.0103)                              | 0.00974<br>(0.0119)                | -<br>-  |
| ln(Distance)  | -0.0255***<br>(0.00126)                         | -<br>-                             | -0.0263***<br>(0.00116)                         |
| ln(Distance) × Female                               | -0.00454***<br>(0.00160)                        | -0.00409**<br>(0.00195)            | -0.00289**<br>(0.00136)                         |
| Adj $R^2$   | 0.27  | 0.28                               | 0.41  |
| Observations  | 382,761   | 362,659                            | 381,733   |
| Controls  | yes   | yes                                | yes   |
| Fixed effects                                       | $U_i \times t \times f + U_j \times t \times f$ | $U_i \times U_j \times t \times f$ | $i \times (t \times f) + j \times (t \times f)$ |

*Notes:* *Apply* is a binary variable equal to 1 if the candidate applied to a specific job. Each observation represents a dyad between a candidate and a potential job opening.  $\ln(\text{Distance})$  is the logarithm of the geographical distance between the job and the candidate's PhD institution. All regressions include controls for age, publication metrics, and supervisor gender. Fixed effects vary across specifications and are indicated in the original field-specific tables. Standard errors clustered by Discipline  $\times$  Candidate Univ  $\times$  Year. Significance levels: \*  $p < 0.10$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$ .

Table D22: Application Patterns by Candidate-Job Dyads - Heterogeneity Analysis

|   | (1)                       | (2)                       |
|---|---------------------------|---------------------------|
| Dependent variable:                         | <i>Apply to position</i>  |                           |
| Age   | $\geq$ median             | $<$ median                |
| $\ln(\text{Distance})$                      | -0.0121***<br>(0.000433)  | -0.0131***<br>(0.000379)  |
| $\ln(\text{Distance}) \times \text{Female}$ | -0.00303***<br>(0.000645) | -0.00186***<br>(0.000494) |
| Years since PhD                             | $\geq$ median             | $<$ median                |
| $\ln(\text{Distance})$                      | -0.00988***<br>(0.000348) | -0.0149***<br>(0.000449)  |
| $\ln(\text{Distance}) \times \text{Female}$ | -0.00150***<br>(0.000496) | -0.00288***<br>(0.000585) |
| Total AIS                                   | $= 0$                     | $> 0$                     |
| $\ln(\text{Distance})$                      | -0.0155***<br>(0.000474)  | -0.0100***<br>(0.000347)  |
| $\ln(\text{Distance}) \times \text{Female}$ | -0.00197***<br>(0.000563) | -0.00149***<br>(0.000519) |
| Number Publications                         | $= 0$                     | $> 0$                     |
| $\ln(\text{Distance})$                      | -0.0170***<br>(0.000589)  | -0.0104***<br>(0.000310)  |
| $\ln(\text{Distance}) \times \text{Female}$ | -0.00117*<br>(0.000675)   | -0.00207***<br>(0.000469) |
| Controls, FE                                | yes                       | yes                       |

Notes: *Apply* is a binary variable equal to 1 if the candidate applied to a specific job. Each observation represents a dyad between a candidate and a potential job opening.  $\ln(\text{Distance})$  is the logarithm of the geographical distance between the job and the candidate's PhD institution. All regressions include controls for age, publication metrics, and supervisor gender. Fixed effects vary across Significance levels are defined as follows: \*  $p < 0.10$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$ .



## D.2 Individual-level Application Behavior

Table D23: Gender Differences in Application Patterns by Distance to Job Offers - Pseudo-Maximum Likelihood

| Dependent variable:         | <i>Applications to Nearby Jobs (<math>\leq 100\text{km}</math>)</i> |                         |                        | <i>Applications to Distant Jobs (<math>&gt;100\text{km}</math>)</i> |                         |                        |
|-----------------------------|---|-------------------------|------------------------|---|-------------------------|------------------------|
|                             | (1)   | (2)                     | (3)                    | (4)   | (5)                     | (6)                    |
|                             | <i>Near Apps</i>  | <i>Near Apps</i>        | <i>Near Apps</i>       | <i>Near Apps</i>  | <i>Near Apps</i>        | <i>Near Apps</i>       |
| Female                      | -0.0528**<br>(0.0241)   | -0.0639***<br>(0.0240)  | -0.0532**<br>(0.0259)  | -0.0712**<br>(0.0285)   | -0.0917***<br>(0.0284)  | -0.102***<br>(0.0283)  |
| Near offers                 | 0.0939***<br>(0.00206)  | 0.0942***<br>(0.00206)  | 0.0755***<br>(0.00444) |   |                         |                        |
| Female $\times$ Near offers | 0.00506***<br>(0.00184)   | 0.00531***<br>(0.00183) | 0.00351*<br>(0.00205)  |   |                         |                        |
| Far offers                  |   |                         |                        | 0.0297***<br>(0.00131)  | 0.0291***<br>(0.00130)  | 0.0163***<br>(0.00316) |
| Female $\times$ Far offers  |   |                         |                        | -0.0000862<br>(0.000672)  | 0.0000112<br>(0.000663) | 0.000114<br>(0.000649) |
| Controls                    |   | yes                     | yes                    |   | yes                     | yes                    |
| Fields X Year FE            | yes   | yes                     | yes                    | yes   | yes                     | yes                    |
| Fields X Univ PhD FE        |   |                         | yes                    |   |                         | yes                    |
| Observations                | 66628.00  | 66628.00                | 57979.00               | 67824.00  | 67824.00                | 64992.00               |

*Notes:* The dependent variable is the number of applications, submitted by candidates, separately for nearby job offers (within 100km) and distant job offers (over 100km). Control variables include age, publication metrics, supervisor gender, and supervisor productivity and number of offers. Estimated using Poisson Pseudo-Maximum Likelihood (PPML) regression. Standard errors are clustered by Discipline X Candidate Univ X Year. Significance levels are defined as follows: \*  $p < 0.10$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$ .

Table D24: Application Patterns by Commuting Time to Job Offers

| Dependent variable:         | <i>Applications to Nearby Jobs (<math>\leq 90min</math>)</i> |                          |                         | <i>Applications to Distant Jobs (<math>&gt;90min</math>)</i> |                         |                         |
|-----------------------------|--|--------------------------|-------------------------|--|-------------------------|-------------------------|
|                             | (1)  | (2)                      | (3)                     | (4)  | (5)                     | (6)                     |
|                             | <i>Near Apps</i>   | <i>Near Apps</i>         | <i>Near Apps</i>        | <i>Near Apps</i>   | <i>Near Apps</i>        | <i>Near Apps</i>        |
| Female                      | -0.0224***<br>(0.00466)                                      | -0.0252***<br>(0.00467)  | -0.0103**<br>(0.00455)  | -0.0342***<br>(0.00812)                                      | -0.0403***<br>(0.00812) | -0.0315***<br>(0.00842) |
| Near offers                 | 0.0232***<br>(0.000623)                                      | 0.0232***<br>(0.000625)  | 0.0217***<br>(0.000954) |  |                         |                         |
| Female $\times$ Near offers | 0.00274***<br>(0.000703)                                     | 0.00280***<br>(0.000701) | 0.000536<br>(0.000709)  |  |                         |                         |
| Far offers                  |  |                          |                         | 0.0150***<br>(0.000508)                                      | 0.0148***<br>(0.000506) | 0.00863***<br>(0.00115) |
| Female $\times$ Far offers  |  |                          |                         | 0.000109<br>(0.000366)                                       | 0.000108<br>(0.000364)  | -0.000280<br>(0.000374) |
| Controls                    |  | yes                      | yes                     |  | yes                     | yes                     |
| Fields X Year FE            | yes  | yes                      | yes                     | yes  | yes                     | yes                     |
| Fields X Univ PhD FE        |  |                          | yes                     |  |                         | yes                     |
| Observations                | 68258  | 68258                    | 67617                   | 68258  | 68258                   | 67617                   |

*Notes:* The dependent variable is the number of applications, submitted by candidates, separately for nearby job offers (within 90min of commuting time) and distant job offers (over 90min of commuting time). Control variables include age, publication metrics, supervisor gender, and supervisor productivity and number of offers. Standard errors are clustered by Discipline X Candidate Univ X Year. Significance levels are defined as follows: \*  $p < 0.10$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$ .

Table D25: Application Patterns by Distance to Job Offers Controlling for age at PhD graduation and time since PhD graduation

|                             | <i>Applications to Nearby Jobs (<math>\leq 100\text{km}</math>)</i> |                             | <i>Applications to Distant Jobs (<math>&gt;100\text{km}</math>)</i> |                            |
|-----------------------------|---|-----------------------------|---|----------------------------|
|                             | (1)   | (2)                         | (3)   | (4)                        |
| Dependent variable:         | $\ln(\text{near apps} + 1)$   | $\ln(\text{near apps} + 1)$ | $\ln(\text{near apps} + 1)$   | $\ln(\text{far apps} + 1)$ |
| Female                      | -0.0228***<br>(0.00404)   | -0.00908**<br>(0.00412)     | -0.0341***<br>(0.00867)   | -0.0319***<br>(0.00896)    |
| Near offers                 | 0.0280***<br>(0.000789)   | 0.0299***<br>(0.00124)      |   |                            |
| Female $\times$ Near offers | 0.00455***<br>(0.000964)  | 0.00131<br>(0.00101)        |   |                            |
| Far offers                  |   |                             | 0.0172***<br>(0.000730)   | 0.0107***<br>(0.00154)     |
| Female $\times$ Far offers  |   |                             | -0.0000998<br>(0.000348)  | -0.000258<br>(0.000356)    |
| Adj R-squared               | 0.33  | 0.38                        | 0.34  | 0.35                       |
| Controls                    | yes   | yes                         | yes   | yes                        |
| Fields X Year FE            | yes   | yes                         | yes   | yes                        |
| Fields X Univ PhD FE        |   | yes                         |   | yes                        |
| Observations                | 68258   | 67617                       | 68258   | 67617                      |

*Notes:* The dependent variable is the natural logarithm of the number of applications plus one, submitted by candidates, separately for nearby job offers (within 100km) and distant job offers (over 100km). Control variables include age at PhD defense, time since PhD graduation, publication metrics, supervisor gender, and supervisor productivity and number of offers. Standard errors are clustered by Discipline X Candidate Univ X Year. Significance levels are defined as follows: \*  $p < 0.10$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$ .

Table D26: Application Patterns by Distance to Job Offers - Excluding Paris

| Dependent variable:         | <i>Applications to Nearby Jobs (<math>\leq 100\text{km}</math>)</i> |                             |                             | <i>Applications to Distant Jobs (<math>&gt;100\text{km}</math>)</i> |                            |                            |
|-----------------------------|---|-----------------------------|-----------------------------|---|----------------------------|----------------------------|
|                             | (1)   | (2)                         | (3)                         | (4)   | (5)                        | (6)                        |
|                             | $\ln(\text{near apps} + 1)$   | $\ln(\text{near apps} + 1)$ | $\ln(\text{near apps} + 1)$ | $\ln(\text{far apps} + 1)$  | $\ln(\text{far apps} + 1)$ | $\ln(\text{far apps} + 1)$ |
| Female                      | -0.0183***<br>(0.00414)   | -0.0194***<br>(0.00418)     | -0.00876**<br>(0.00428)     | -0.0368***<br>(0.0112)  | -0.0454***<br>(0.0112)     | -0.0441***<br>(0.0117)     |
| Near offers                 | 0.0270***<br>(0.00118)  | 0.0270***<br>(0.00118)      | 0.0397***<br>(0.00184)      |   |                            |                            |
| Female $\times$ Near offers | 0.00631***<br>(0.00176)   | 0.00635***<br>(0.00176)     | 0.00152<br>(0.00179)        |   |                            |                            |
| Far offers                  |   |                             |                             | 0.0159***<br>(0.00124)  | 0.0160***<br>(0.00124)     | 0.00738***<br>(0.00242)    |
| Female $\times$ Far offers  |   |                             |                             | 0.0000701<br>(0.000419)   | 0.000107<br>(0.000416)     | -0.000107<br>(0.000427)    |
| Adj R-squared               | 0.26  | 0.25                        | 0.30                        | 0.32  | 0.33                       | 0.35                       |
| Controls                    |   | yes                         | yes                         |   | yes                        | yes                        |
| Fields X Year FE            | yes   | yes                         | yes                         | yes   | yes                        | yes                        |
| Fields X Univ PhD FE        |   |                             | yes                         |   |                            | yes                        |
| Observations                | 45385   | 45385                       | 44882                       | 45385   | 45385                      | 44882                      |

*Notes:* The dependent variable is the natural logarithm of the number of applications plus one, submitted by candidates, separately for nearby job offers (within 100km) and distant job offers (over 100km). Control variables include age, publication metrics, supervisor gender, and supervisor productivity and number of offers. This sample exclude candidates from Paris. Standard errors are clustered by Discipline X Candidate Univ X Year. Significance levels are defined as follows: \*  $p < 0.10$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$ .

Table D27: Application Patterns by Distance to Job Offers - subsamples based on application timing

|  | <i>Applications to Nearby Jobs (<math>\leq 100\text{km}</math>)</i> |                         |                        | <i>Applications to Distant Jobs (<math>&gt;100\text{km}</math>)</i> |                        |                        |
|--|---|-------------------------|------------------------|---|------------------------|------------------------|
|  | (1)   | (2)                     | (3)                    | (4)   | (5)                    | (6)                    |
| Dependent variable:  | $\ln(\text{near apps} + 1)$   |                         |                        | $\ln(\text{far apps} + 1)$  |                        |                        |
| <b>Panel A: Applied at least once in career</b>                      |   |                         |                        |   |                        |                        |
| Female   | -0.0164***<br>(0.00495)   | -0.0198***<br>(0.00497) | -0.00613<br>(0.00512)  | -0.0183*<br>(0.0107)  | -0.0283***<br>(0.0107) | -0.0237**<br>(0.0113)  |
| Near offers  | 0.0392***<br>(0.00089)  | 0.0393***<br>(0.00089)  | 0.0384***<br>(0.00145) |   |                        |                        |
| Female $\times$ Near offers  | 0.00421***<br>(0.00105)   | 0.00431***<br>(0.00105) | 0.00098<br>(0.00109)   |   |                        |                        |
| Far offers   |   |                         |                        | 0.0198***<br>(0.00083)  | 0.0196***<br>(0.00082) | 0.0140***<br>(0.00180) |
| Female $\times$ Far offers   |   |                         |                        | -0.00047<br>(0.00039)   | -0.00050<br>(0.00039)  | -0.00073*<br>(0.00040) |
| Adj $R^2$  | 0.40  | 0.40                    | 0.45                   | 0.37  | 0.37                   | 0.39                   |
| Observations   | 49,648  | 49,648                  | 48,959                 | 49,648  | 49,648                 | 48,959                 |
| <b>Panel B: Applied at least once in first year of qualification</b> |   |                         |                        |   |                        |                        |
| Female   | -0.0133**<br>(0.00626)  | -0.0151**<br>(0.00628)  | -0.00347<br>(0.00634)  | -0.0301**<br>(0.0120)   | -0.0372***<br>(0.0120) | -0.0317**<br>(0.0130)  |
| Near offers  | 0.0476***<br>(0.00099)  | 0.0476***<br>(0.00099)  | 0.0440***<br>(0.00159) |   |                        |                        |
| Female $\times$ Near offers  | 0.00288**<br>(0.00115)  | 0.00296**<br>(0.00115)  | 0.00031<br>(0.00116)   |   |                        |                        |
| Far offers   |   |                         |                        | 0.0250***<br>(0.00085)  | 0.0248***<br>(0.00085) | 0.0210***<br>(0.00192) |
| Female $\times$ Far offers   |   |                         |                        | -0.00048<br>(0.00039)   | -0.00048<br>(0.00039)  | -0.00071*<br>(0.00041) |
| Adj $R^2$  | 0.46  | 0.45                    | 0.50                   | 0.50  | 0.41                   | 0.41                   |
| Observations   | 37,755  | 37,755                  | 36,987                 | 37,755  | 37,755                 | 36,987                 |
| Controls   |   | yes                     | yes                    |   | yes                    | yes                    |
| Fields $\times$ Year FE  | yes   | yes                     | yes                    | yes   | yes                    | yes                    |
| Fields $\times$ Univ PhD FE  |   |                         | yes                    |   |                        | yes                    |

*Notes:* The dependent variable is the natural logarithm of the number of applications plus one, separately for nearby jobs (within 100km) and distant jobs (over 100km). Control variables include age, publication metrics, supervisor gender, and supervisor productivity and number of offers. Panel A includes candidates who applied at least once in their career. Panel B includes those who applied in the first year of qualification. Standard errors are clustered by Discipline  $\times$  Candidate Univ  $\times$  Year. Significance levels: \*  $p < 0.10$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$ .

Table D28: Application Patterns by Distance to Job Offers – by Field

|   | <i>Applications to Nearby Jobs (<math>\leq 100\text{km}</math>)</i> |                        |                        | <i>Applications to Distant Jobs (<math>&gt;100\text{km}</math>)</i> |                         |                         |
|---|---|------------------------|------------------------|---|-------------------------|-------------------------|
|   | (1)   | (2)                    | (3)                    | (4)   | (5)                     | (6)                     |
| <b>Panel A: Biological and Earth Sciences</b> |   |                        |                        |   |                         |                         |
| Female  | -0.00437<br>(0.00380)   | -0.00297<br>(0.00380)  | -0.00501<br>(0.00405)  | -0.0258**<br>(0.0115)   | -0.0236**<br>(0.0116)   | -0.0180<br>(0.0114)     |
| Near offers                                   | 0.0105***<br>(0.00147)  | 0.0105***<br>(0.00147) | 0.0181***<br>(0.00229) |   |                         |                         |
| Female $\times$ Near offers                   | 0.00234<br>(0.00179)  | 0.00224<br>(0.00178)   | 0.00246<br>(0.00195)   |   |                         |                         |
| Far offers                                    |   |                        |                        | 0.00834***<br>(0.00130)   | 0.00824***<br>(0.00130) | 0.00280<br>(0.00224)    |
| Female $\times$ Far offers                    |   |                        |                        | -0.00042<br>(0.00071)   | -0.00043<br>(0.00071)   | -0.00037<br>(0.00071)   |
| Adj $R^2$                                     | 0.07  | 0.07                   | 0.08                   | 0.06  | 0.07                    | 0.10                    |
| Observations                                  | 12,531  | 12,531                 | 12,200                 | 12,531  | 12,531                  | 12,200                  |
| <b>Panel B: Humanities</b>                    |   |                        |                        |   |                         |                         |
| Female  | -0.00233<br>(0.00631)   | -0.00064<br>(0.00631)  | -0.00112<br>(0.00676)  | -0.0384***<br>(0.0139)  | -0.0326**<br>(0.0139)   | -0.0348**<br>(0.0148)   |
| Near offers                                   | 0.0200***<br>(0.00090)  | 0.0201***<br>(0.00091) | 0.0240***<br>(0.00168) |   |                         |                         |
| Female $\times$ Near offers                   | 0.00212<br>(0.00155)  | 0.00206<br>(0.00155)   | 0.00156<br>(0.00160)   |   |                         |                         |
| Far offers                                    |   |                        |                        | 0.0155***<br>(0.00096)  | 0.0154***<br>(0.00095)  | 0.00736***<br>(0.00221) |
| Female $\times$ Far offers                    |   |                        |                        | 0.00055<br>(0.00046)  | 0.00051<br>(0.00046)    | 0.00035<br>(0.00048)    |
| Adj $R^2$                                     | 0.17  | 0.17                   | 0.20                   | 0.15  | 0.15                    | 0.17                    |
| Observations                                  | 26,485  | 26,485                 | 26,075                 | 26,485  | 26,485                  | 26,075                  |
| <b>Panel C: STEM</b>                          |   |                        |                        |   |                         |                         |
| Female  | -0.0133**<br>(0.00626)  | -0.0151**<br>(0.00628) | -0.00347<br>(0.00634)  | -0.0301**<br>(0.0120)   | -0.0372***<br>(0.0120)  | -0.0317**<br>(0.0130)   |
| Near offers                                   | 0.0476***<br>(0.00099)  | 0.0476***<br>(0.00099) | 0.0440***<br>(0.00159) |   |                         |                         |
| Female $\times$ Near offers                   | 0.00288**<br>(0.00115)  | 0.00296**<br>(0.00115) | 0.00031<br>(0.00116)   |   |                         |                         |
| Far offers                                    |   |                        |                        | 0.0250***<br>(0.00085)  | 0.0248***<br>(0.00085)  | 0.0210***<br>(0.00192)  |
| Female $\times$ Far offers                    |   |                        |                        | -0.00048<br>(0.00039)   | -0.00048<br>(0.00039)   | -0.00071*<br>(0.00041)  |
| Adj $R^2$                                     | 0.46  | 0.45                   | 0.50                   | 0.50  | 0.41                    | 0.41                    |
| Observations                                  | 37,755  | 37,755                 | 36,987                 | 37,755  | 37,755                  | 36,987                  |
| <b>Panel D: Social Sciences</b>               |   |                        |                        |   |                         |                         |
| Female  | -0.00112<br>(0.0237)  | -0.00822<br>(0.0237)   | -0.0113<br>(0.0232)    | -0.0613<br>(0.0470)   | -0.0606<br>(0.0464)     | -0.0651<br>(0.0514)     |
| Near offers                                   | 0.0478***<br>(0.00235)  | 0.0484***<br>(0.00234) | 0.0409***<br>(0.00449) |   |                         |                         |
| Female $\times$ Near offers                   | 0.00080<br>(0.00295)  | 0.00104<br>(0.00294)   | 0.00105<br>(0.00285)   |   |                         |                         |
| Far offers                                    |   |                        |                        | 0.0290***<br>(0.00219)  | 0.0278***<br>(0.00215)  | 0.0141**<br>(0.00569)   |
| Female $\times$ Far offers                    |   |                        |                        | 0.00001<br>(0.00094)  | -0.00035<br>(0.00092)   | -0.00043<br>(0.00098)   |
| Adj $R^2$                                     | 0.36  | 0.37                   | 0.44                   | 0.28  | 0.30                    | 0.32                    |
| Observations                                  | 6,477   | 6,477                  | 6,262                  | 6,477   | 6,477                   | 6,262                   |
| Controls                                      |   | yes                    | yes                    |   | yes                     | yes                     |
| Fields $\times$ Year FE                       | yes   | yes                    | yes                    | yes   | yes                     | yes                     |
| Fields $\times$ Univ PhD FE                   |   |                        | yes                    |   |                         | yes                     |

*Notes:* The dependent variable is the natural logarithm of the number of applications plus one, separately for nearby job offers ( $\leq 100\text{km}$ ) and distant job offers ( $>100\text{km}$ ). All regressions include controls for age, publication metrics, supervisor gender, and supervisor productivity and number of offers. Each panel restricts the sample to candidates in a specific field. Standard errors are clustered by Discipline  $\times$  Candidate Univ  $\times$  Year. Significance levels: \*  $p < 0.10$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$ .

Table D29: Application Patterns by Geography of Job Offers – Same City vs Same Region

| Panel A: Same City                    |                                      |                                      |                                      |  |  |  |
|---------------------------------------|--------------------------------------|--------------------------------------|--------------------------------------|--|--|--|
| Dependent variable:                   | Applications to Jobs in Same City    |                                      |                                      | Applications to Jobs Outside City            |  |  |
|                                       | (1)<br>$\ln(\text{city apps} + 1)$   | (2)<br>$\ln(\text{city apps} + 1)$   | (3)<br>$\ln(\text{city apps} + 1)$   | (4)<br>$\ln(\text{non-city apps} + 1)$       | (5)<br>$\ln(\text{non-city apps} + 1)$       | (6)<br>$\ln(\text{non-city apps} + 1)$       |
| Female                                | -0.0121***<br>(0.00338)              | -0.0133***<br>(0.00338)              | -0.00472<br>(0.00334)                | -0.0301***<br>(0.00877)                      | -0.0370***<br>(0.00877)                      | -0.0352***<br>(0.00910)                      |
| Same-city offers                      | 0.0357***<br>(0.00108)               | 0.0358***<br>(0.00108)               | 0.0352***<br>(0.00147)               |  |  |  |
| Female $\times$ Same-city offers      | 0.00417***<br>(0.00120)              | 0.00420***<br>(0.00120)              | 0.00140<br>(0.00122)                 |  |  |  |
| Outside-city offers                   |                                      |                                      |                                      | 0.0179***<br>(0.00089)                       | 0.0176***<br>(0.00088)                       | 0.0117***<br>(0.00183)                       |
| Female $\times$ Outside-city offers   |                                      |                                      |                                      | 0.00006<br>(0.00034)                         | 0.00007<br>(0.00033)                         | -0.00009<br>(0.00034)                        |
| Adj $R^2$                             | 0.35                                 | 0.35                                 | 0.40                                 | 0.33   | 0.33   | 0.35   |
| Observations                          | 68,258                               | 68,258                               | 67,617                               | 68,258                                       | 68,258                                       | 67,617                                       |
| Panel B: Same Region                  |                                      |                                      |                                      |  |  |  |
| Dependent variable:                   | Applications to Jobs in Same Region  |                                      |                                      | Applications to Jobs Outside Region          |  |  |
|                                       | (1)<br>$\ln(\text{region apps} + 1)$ | (2)<br>$\ln(\text{region apps} + 1)$ | (3)<br>$\ln(\text{region apps} + 1)$ | (4)<br>$\ln(\text{outside-region apps} + 1)$ | (5)<br>$\ln(\text{outside-region apps} + 1)$ | (6)<br>$\ln(\text{outside-region apps} + 1)$ |
| Female                                | -0.0234***<br>(0.00453)              | -0.0258***<br>(0.00454)              | -0.0146***<br>(0.00474)              | -0.0240***<br>(0.00859)                      | -0.0308***<br>(0.00860)                      | -0.0303***<br>(0.00889)                      |
| Same-region offers                    | 0.0270***<br>(0.00082)               | 0.0271***<br>(0.00082)               | 0.0292***<br>(0.00123)               |  |  |  |
| Female $\times$ Same-region offers    | 0.00419***<br>(0.00099)              | 0.00426***<br>(0.00099)              | 0.00181*<br>(0.00104)                |  |  |  |
| Outside-region offers                 |                                      |                                      |                                      | 0.0174***<br>(0.00081)                       | 0.0172***<br>(0.00080)                       | 0.0114***<br>(0.00153)                       |
| Female $\times$ Outside-region offers |                                      |                                      |                                      | -0.00023<br>(0.00035)                        | -0.00021<br>(0.00035)                        | -0.00033<br>(0.00036)                        |
| Adj $R^2$                             | 0.34                                 | 0.34                                 | 0.37                                 | 0.32   | 0.33   | 0.35   |
| Observations                          | 68,258                               | 68,258                               | 67,617                               | 68,258                                       | 68,258                                       | 67,617                                       |
| Controls                              |                                      | yes                                  | yes                                  |  | yes  | yes  |
| Fields $\times$ Year FE               | yes                                  | yes                                  | yes                                  | yes  | yes  | yes  |
| Fields $\times$ Univ PhD FE           |                                      |                                      | yes                                  |  |  | yes  |

*Notes:* The dependent variable is the natural logarithm of the number of applications plus one. "Same-unit" applications refer to those submitted to jobs in the same city (Panel A) or same administrative region (Panel B) as the candidate's PhD institution. "Outside-unit" refers to all other locations. All regressions include controls for age, publication metrics, supervisor gender, and supervisor productivity and number of offers. Standard errors are clustered by Discipline  $\times$  Candidate Univ  $\times$  Year. Significance levels: \*  $p < 0.10$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$ .