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So Far Away? Hiring Discrimination against Female Commuters

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So Far Away? Hiring Discrimination against Female Commuters*

Abstract

We study gender differences in employers' responses to commuting distance using data from a large-scale correspondence test in Germany, Switzerland, and Austria. A 10 km increase in driving distance reduces women's probability of receiving an interview invitation by 1.8 percentage points, around 9 percent of the mean female invitation rate, while commuting distance has no corresponding effect for men. The gender difference is statistically significant and robust to alternative distance measures and thresholds, firms' rural or urban location, and local labor-market tightness. The female distance penalty does not vary detectably with applicants' reported marital status or the presence of children, providing no support for screening based on these observed indicators of household responsibilities.

JEL classification

C93, J16, J61, J71, R41

Keywords

gender discrimination, commuting, labor market, field experiment, Germany, Switzerland, Austria

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1. Introduction

Women tend to commute shorter distances to work than men, a pattern that has remained consistent over several decades. The trend was first documented in studies focused on the United States (e.g., White, 1977; White, 1986) and has since been corroborated by numerous studies across various regions and time periods.[1] Over time, this "stylized fact" has become a well-established characteristic of commuting behavior, with research consistently indicating that women generally travel less distance for work compared to their male counterparts.

The literature has predominantly offered supply-side explanations for this phenomenon, arguing that women simply *prefer* short commutes (e.g., Le Barbanchon, Rathelot, and Roulet (2021), Mueller-Gastell and Pedulla (2025), Eriksson and Lagerström (2012)). The reason for this, it has frequently been argued, lies in the unequal burden of domestic tasks typically carried out by women in heterosexual families which restrict the time available for commuting (see e.g. Hanson and Johnston (1985), Johnston-Anumonwo (1992)). However, there may also be demand-side explanations related to employer discrimination (Baert (2015), Van Borm and Baert (2022), Brandén, Bygren, and Gähler (2018)) against female distant commuters, possibly due to perceived lower commitment or higher turnover risk, particularly in connection with the presence of children. This distinction between supply-side versus demand-side mechanisms matters, because they call for different policy levers and have different welfare implications: if women commute less because they prefer shorter commutes or face household constraints, the gender commuting gap primarily reflects supply-side choices or constraints; if employers penalize women with longer commutes, the same observed pattern reflects restricted access to geographically broader labor markets.

Demand-side factors have received little attention largely because, in observational data, it is difficult to separate employer behavior from workers' preferences and constraints – that is, to isolate the causal effect of employer discrimination on outcomes by gender and commute distance. To date, only one study (Brandén, Bygren, and Gähler (2018)) has focused on gender-based hiring discrimination with respect to commuting distance, and systematic evidence is still missing. We address this gap by providing, to our knowledge, the most comprehensive assessment to date, leveraging data from a large-scale correspondence study conducted across German-speaking countries (Germany, Switzerland, and Austria). By sending equally qualified fictitious applications to real vacancies and randomly varying applicants' family situation, we test whether employers are less likely to invite candidates to interviews when their residential address indicates a longer commuting distance. The varying distance from our candidates' addresses to those of their potential employers allows us to causally test whether

[1] McLafferty (1997) and Preston and McLafferty (2016) for the New York metropolitan region, Petrongolo and Ronchi (2020) for the UK, Chidambaram and Scheiner (2020) for Germany, Le Barbanchon, Rathelot, and Roulet (2021) for France are representative papers of a vast literature on gender differences in commuting time.

companies invite more distant candidates for job interviews less frequently. In line with observed daily commuting times, we focus on commuting distances of up to 50 km, while confirming the robustness of our analysis to longer distances as well. We further examine whether this potential commuting effect differs by gender and the family characteristics of the applicant.

Our findings show that, while commuting distance does not reduce the interview invitation rate for male applicants, it does so for female applicants. Specifically, a 10 km increase in driving distance reduces callback rates for women by 1.8 percentage points, which amounts to a 9% decline relative to the average interview invitation rate for women in our sample. These results withstand a comprehensive series of robustness checks. Those include comparing interview invitation rates across companies located in rural versus urban areas, controlling for labor market tightness (which could modify how employers perceive the credibility of applicants living farther from the company), checking whether invitation rates vary across advertised jobs for full- or part-time positions and considering different measures of commuting distance pertaining to alternative transportation modes. When we examine whether firm size affects the penalty against female commuters, we find that it is more pronounced in smaller companies (of up to 100 employees). Interestingly, the penalty is not confined to mothers or married women: we find unfavorable treatment for *all* women who live farther away, irrespective of marital status or the presence of children.

Our findings are consistent with stereotypical beliefs that women are generally less spatially mobile (Hanson and Pratt, 1995), as well as with the persistent association between cars and masculinity (e.g., Morgan (2009), Redshaw (2024)). Such gendered perceptions may extend to employers, who may perceive women as generally less willing to undertake commutes. More broadly, the pattern may also align with gendered expectations about reliability, commitment, or retention when long commutes are involved.

2. Literature Review

In the following, we briefly review two strands of literature: (1) research on gendered patterns in commuting distances, abstracting from purely spatial explanations;[2] and (2) research on employer discrimination against long-distance commuters. The most prominent reason proposed for different commuting times of men and women is the unequal division of labor within heterosexual households, which often puts women in a time crunch. As a result, so the argument, women seek work closer to

[2]The spatial discrimination literature studies employer responses to particular postcodes (for respective correspondence tests, see Bunel, L'Horty, and Petit (2016); L'Horty, Bunel, and Petit (2019)) as well as commuting distance irrespective of gender: longer commutes may raise absenteeism and reduce productivity (Van Ommeren and Gutiérrez-i-Puigarnau (2011)), potentially inducing distance "redlining" (Zenou (2002)). Separately, gender gaps can reflect job/residence geography: female-dominated jobs (e.g., service jobs) are more evenly distributed than male-dominated jobs (e.g., production), leading to smaller gender commuting gaps, for example, among workers living in city centers (see Hanson and Johnston (1985), Liu and Su (2024)).

home.

This supply-side factor affecting commuting times is known as the "household responsibility hypothesis" (see e.g. Hanson and Johnston (1985), Johnston-Anumonwo (1992))[3] and has attracted significant interest recently. For example, Bütikofer, Karadakic, and Willén (2025) and Borghorst, Mulalic, and van Ommeren (2024) conducted event studies with Norwegian and Danish register data, respectively, and showed that commuting distances start to differ between men and women right after childbirth. The latter also found that women with long commutes are much more likely to switch jobs upon having a child, an effect not present for men. For Germany, using a fixed-effects model based on the German Socioeconomic Panel (GSOEP), Skora, Rüger, and Stawarz (2020) identified a 33% reduction in commuting distance associated with the transition to motherhood, with no corresponding effect for the transition to fatherhood.[4] Also for Germany, but using administrative social security records, Bergemann, Brunow, and Stockton (2024) found that *single* women's marginal willingness to pay for reducing commuting distance is similar to men's; however, it more than doubles after the birth of a first child and significantly contributes to the motherhood wage gap.

For France, Le Barbanchon, Rathelot, and Roulet (2021) exploited the fact that, in order to register as unemployed, job seekers must report their reservation wage and commuting threshold to the French Public Employment Service (PES). The study shows that gender differences in acceptable commuting thresholds intensify after the birth of a first child and explain about 14% of the residualized gender wage gap. Importantly, the authors explore a rich administrative data set which also includes hiring outcomes. Their results show that firms do not distinguish between women and men when applicants live farther away, suggesting that most of the gender gap in commuting is driven by the supply side of the labor market.[5] Further evidence for a supply-side effect in line with the "household responsibility hypothesis" has been provided by Mueller-Gastell and Pedulla (2025) who examined job applications through the National Longitudinal Study of Job Search (NLSJS) for the US. They found that *partnered* women (unlike women who had never married) are less likely than comparable men to apply for a job that would require a move (see Eriksson and Lagerström (2012) for related evidence from Sweden).[6]

[3]A related hypothesis from the urban geography literature is the "spatial entrapment theory," which highlights how the labor-market spatial structure, under prevailing gender norms, constrains women's job options and commutes (see Rapino and Cooke (2011), Kwan (1999), Hanson and Pratt (1995)).

[4]Mothers who reduced their commuting time also experienced a larger wage reduction than those who did not, partly because of losses in firm-specific human capital and partly because they took jobs less suited to their skills and in smaller firms, as the authors argue. Relatedly, Petrongolo and Ronchi (2020) pointed out that, in the UK, the gender wage gap and the gender commuting gap follow similar life-cycle patterns. See also Liu and Su (2024).

[5]Other evidence for the "household responsibility hypothesis" comes from Giménez-Nadal and Molina (2016), who, using Dutch time-use survey data, found that the effect of home production on commuting time is more than twice as intense for women as for men, and hours devoted to childcare only impact female commuting time. Relatedly, Chidambaram and Scheiner (2020) report, on the basis of German time-use data, that an increase in time spent on unpaid work by the male partner in dual-earner couples decreases the gender commuting gap.

[6]Gender norms appear to play a crucial role in how gender commuting gaps relate to the family status of workers. For example, employing an epidemiological approach, Marcén and Morales (2021) found that parents originating in more gender equal countries display a lower commuting gender gap. See also Farré, Jofre-Monseny, and Torrecillas

Taking stock, the labor supply side of the literature has very much focused on the household responsibilities hypothesis in conjunction with children. Preferences of mothers contribute to the gender commuting gap, possibly as their threshold for the maximal acceptable commute declines after a first birth. While the literature suggests that labor supply aspects quantitatively matter for the gender commuting gap, it is important to examine whether labor *demand* also plays a role.

Only a handful of experimental studies examine how employers react to commuting distances of workers – and only one has an explicit gender focus. For example, Phillips (2020) conducted a correspondence test in the Washington DC low-wage sector and documented unfavorable treatment of applicants with long commutes while holding neighborhood affluence constant (no gender effects reported). Similarly, Baert (2015) found in Belgium that applicants living farther away were less likely to receive interview invitations. Although gender-specific estimates were not reported, the study notes that there was no gender difference. In a vignette study for the US, Van Borm and Baert (2022) showed that hiring chances for applicants with longer commutes (exceeding 50 miles, roughly 80 km) were significantly lower – also irrespective of gender. Brandén, Bygren, and Gähler (2018) explicitly examined gender differences in employer discrimination as a potential mechanism underlying the "trailing spouse" phenomenon, whereby families are more likely to relocate to accommodate men's than women's careers. In a correspondence test conducted in Sweden, they found that callback rates decline with commuting distance, with gender differences emerging only beyond 50 km - likely beyond the range of daily commuting. The fact that couples are more likely to relocate in response to men's career opportunities may provide a plausible rationale for this finding.

While Brandén, Bygren, and Gähler (2018) provide important initial evidence on gender differences in employers' responses to commuting distance, our study extends this literature in several respects. First, we focus on distances within the range of ordinary daily commuting. Second, we use a large correspondence test covering multiple countries, Germany, Austria, and Switzerland. Third, our experimental design, which varies marital status and the presence and ages of children, permits a more nuanced assessment of household responsibilities and tests whether the female distance penalty is concentrated among applicants with higher implied responsibilities. We find no such concentration. More broadly, we show that the gender-specific distance penalty is robust to alternative distance measures and to differences in employer location and local labor-market conditions. Together, these findings provide new evidence that employer-side behavior contributes to the gender commuting gap.

(2023) for the impact of culture on the effects of commuting distance on the labor force participation of married women. Additionally, because gender norms shape household roles in heterosexual but not same-sex couples, gender commuting gaps are smaller among partnered gays and lesbians than among heterosexuals (Oreffice and Sansone (2023)).

3. Experimental Design

To examine whether employers respond differently to commuting distance for female and male applicants, we use data from a correspondence study[7] conducted in Germany, Austria, and Switzerland by Becker, Fernandes, and Weichselbaumer (2019).[8] This experiment, conducted between March 2013 and June 2015, aimed to uncover potential labor market discrimination against women based on specific family profiles, such as marital status and the presence of children. To achieve this, over 8,000 fictitious, matched applications with identical human capital but different family profiles were sent to real firms.

The experiment focused on two female-dominated occupations: accountants and secretaries. These professions were selected because their job tasks are largely the same across companies and industries, with numerous similar job postings available from various employers in different cities. Additionally, the required qualifications are relatively standardized across firms, enabling the use of a single set of application documents for all employers. Furthermore, these jobs allow for email applications as well as the construction of realistic résumés. However, it is important to note that accountants and secretaries are not representative of the entire economy, and therefore, the findings may not generalize to other occupations.

In the German-speaking countries where the study was conducted, it is common for job candidates to include personal details in their résumés, such as marital status and the number of children (see Appendix Figure A1). Leveraging this institutional setting, the study categorized applicants into five "family types": (1) single, no kids (default); (2) married, no kids; (3) married, 2 young kids (ages 3 and 5); (4) married, 2 older kids (ages 7 and 9); and (5) no information provided.[9] These family profiles were designed to signal differences in expected fertility and in household responsibilities associated with children.

All applicants had similar birth dates, around the end of May 1982. The correspondence testing experiment was implemented across several cities in Germany (Berlin, Cologne, Frankfurt, Hamburg, Munich, Stuttgart), Switzerland (Basel, Bern, Zurich), and Austria (Vienna). We carefully prepared two sets of experimental materials—including cover letters, résumés, school reports, and reference letters. These occupation-specific templates, which determined the visual style of the application as well as personal details like birthplace and school attended, were based on real life applications and indicated identical levels of human capital.

In each city, we selected two centrally located addresses and assigned to each address a male and a female applicant sharing the same surname. Each firm received two applications, differing in city

[7]See Baert (2018) for an overview of correspondence studies testing for hiring discrimination.

[8]The correspondence study received ethics approval in the early 2010s before pre-registered field experiments were commonplace. Hence, we cannot provide a link to a pre-analysis plan.

[9]Another distinctive feature of the local customs in German-speaking countries is the inclusion of photographs in the résumé (see Weichselbaumer (2020)). We adhered to this custom and included photos which we controlled for in our analysis.

address/name and template. Gender and family profiles were randomized, with gender sampled at a 2:1 female-to-male ratio. The original experiment over-sampled women because it was designed primarily to study discrimination related to female applicants' family and fertility profiles. Companies could contact the fictitious applicants by email, telephone, or mail. When our candidates received interview invitations, we promptly declined, citing the acceptance of another offer, to minimize any inconvenience or costs to the employer.[10]

4. Data

This paper examines how companies respond to varying commuting distances across different types of applicants. Although in our experiment the applicants' addresses were fixed within each city, the firms could be located anywhere within the city, or beyond, generating substantial variation in commuting distances. We exploit this variation in commuting distance to estimate whether employers' responses to distance differ by applicant gender and family profile. In Germany, roughly 95% of the working population travel under 50 km to get to work (Federal Statistical Office of Germany, 2026). We therefore focus on distances below 50 km, where commuting is typically feasible without a move. We show in our robustness checks that our results are not sensitive to this threshold.[11]

4.1 Measures of commuting distance

For each applicant, we calculated the commuting distance and duration between home and firm addresses using Google Maps for a typical 8 a.m. Monday morning commute. Google Maps calculates the 8 a.m. commute by estimating real-time traffic conditions using a combination of historical traffic data, live traffic conditions, and predictive algorithms. The optimal route is determined based on typical road conditions, including traffic congestion, accidents, and road closures, to provide the most efficient travel time.[12]

In our main results, we focus on driving distance primarily because most people in Germany commute by car (Federal Statistical Office of Germany, 2026). We also use Google Maps' mode-specific

[10]Critics of correspondence studies note the burden that 'fake applications' can place on employers; to minimize this potential problem, we promptly declined any interview invitations. It is crucial to note that the German Federal Antidiscrimination Agency (2010) explicitly affirmed the legality of correspondence testing as a legitimate method for uncovering discrimination.

[11]Note that our dataset is somewhat smaller than that used by Becker, Fernandes, and Weichselbaumer (2019) because many companies did not include workplace addresses in their job advertisements and some large firms listed only their headquarters rather than the worksite location. By dropping these cases, we lose 8.8% of the observations, as detailed in Table A1 in the appendix. Additionally, when restricting distances to be under the 50 km threshold, we lose a total of 19.2% of the original 8,669 observations, leaving us with N=7,004. Appendix A includes additional information about the experimental design and data distributions.

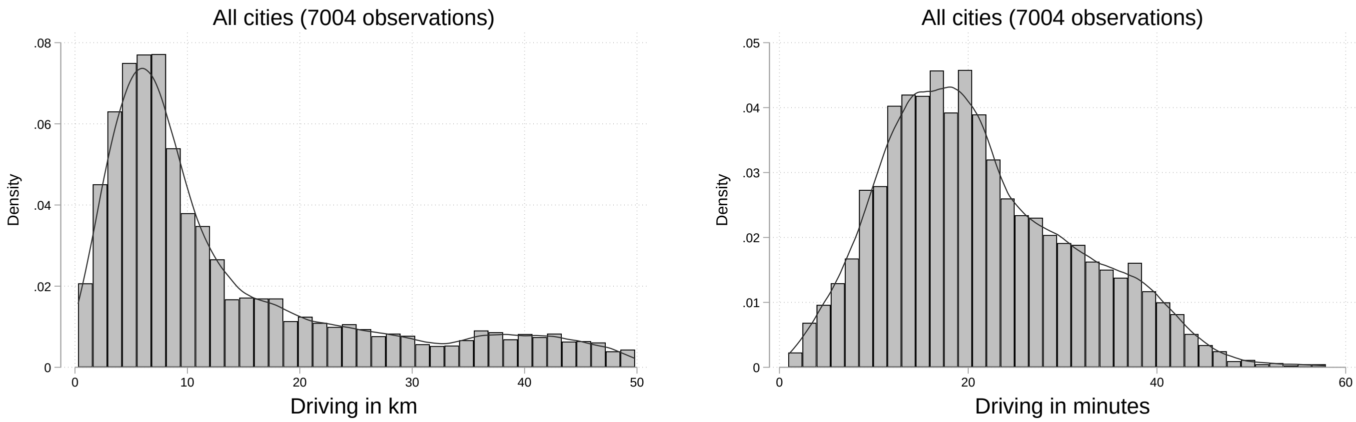
[12]The proposed route and commuting times may vary slightly from day to day due to fluctuating traffic patterns; however, the retrieved values offer a reliable approximation of typical driving distances and durations at 8 a.m.

travel times and distances (driving, cycling, public transport, walking) and the geodesic distance as alternative measures. However, results are very similar across these different metrics.

Figure 1: Histograms of driving distance and duration, for an 8 a.m. commute

(a) Distance driving

(b) Duration driving



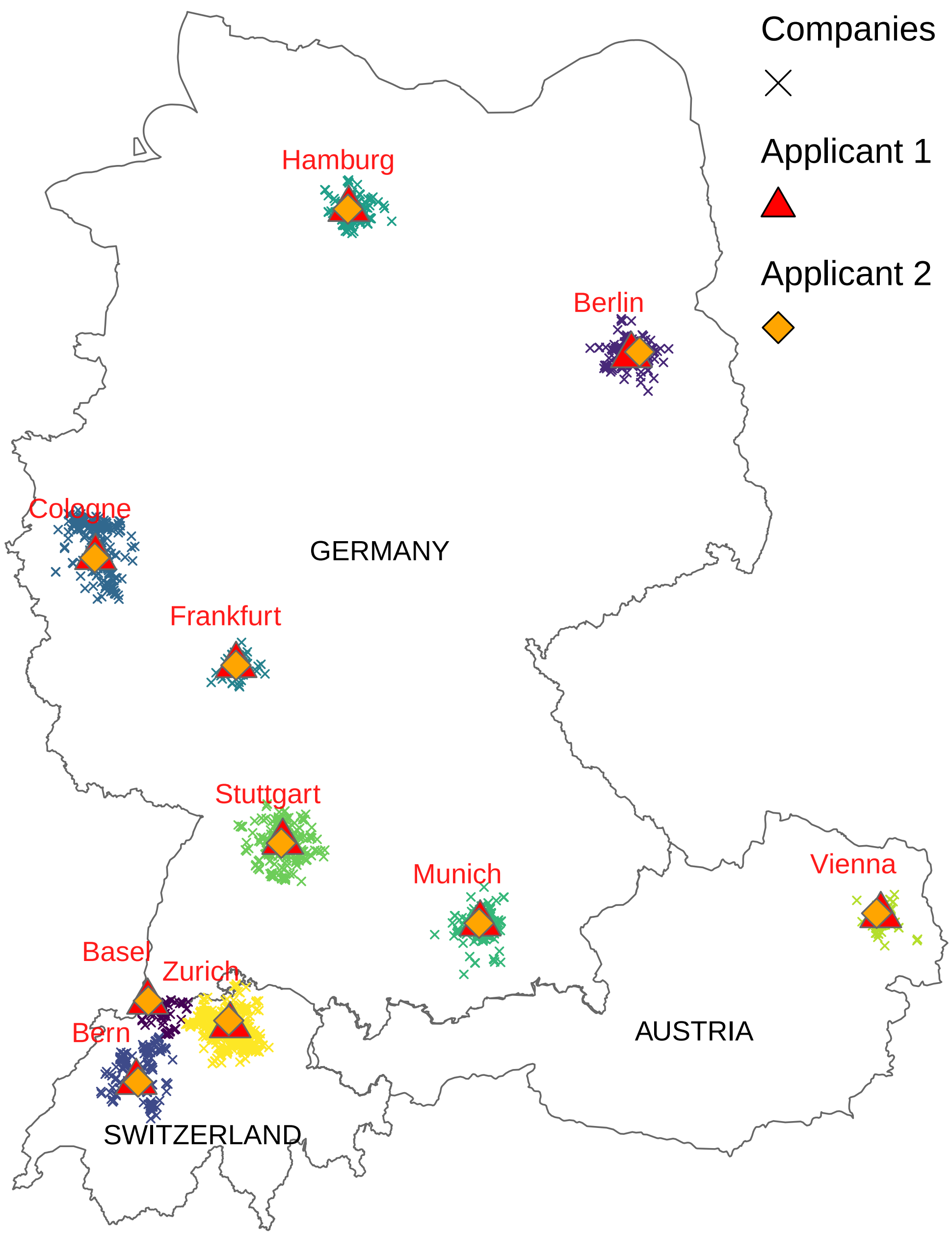
Notes: This figure presents histograms of commuting distance and duration for an 8 a.m. Monday trip. The commuting distance was calculated based on candidates' home addresses and firm locations listed in job advertisements, using Google Maps. Panel (a) displays the histogram of commuting distances in kilometers. The distribution exhibits a rightward skew, with distances of 2-12 km having the highest densities. Panel (b) shows the histogram of commuting durations in minutes. This distribution also has a rightward skew, with durations of 9-25 min having the highest densities.

Figure 1 presents the distribution of commuting distances and durations for the 8 a.m. commute across all cities in the study. Panel (a) displays the histogram of driving distance, measured in kilometers, while panel (b) shows the histogram of driving duration, measured in minutes. Both distributions are skewed, with most job advertisements located within 10 to 20 kilometers of the applicant addresses. However, some firms are located much further away, with distances reaching up to 50 kilometers (or more, if we do not restrict our data). While most advertised jobs are relatively close to the applicant addresses, there is a notable spread, with some firms located in the broader metropolitan area and beyond. The shape of the distributions indicates that commuting distances and durations are not normally distributed but rather exhibit a skew akin to log-normal distributions. In Appendix A, we provide more information by city and mode of transportation.[13]

Figure 2 depicts the applicant and company addresses for the different cities investigated (for driving distances up to 50 km). The red triangle and the yellow diamond represent the two applicant addresses per city (these are typically too close to be visually distinguishable), the colored crosses show the firm addresses. The resulting commuting distances are the focus of this study.

[13]Appendix Figure A2 presents histograms for commuting distance by car for the different cities; Figure A3 displays histograms of commuting duration and distance for cycling, walking, and public transport.

Figure 2: Applicants and firms across countries and cities, driving distance $\leq$50 km



Notes: This map shows the applicant and company addresses for the different cities investigated, up to 50 km. The experiment was carried out in Basel, Bern and Zurich in Switzerland; Berlin, Cologne, Frankfurt, Hamburg, Munich, and Stuttgart in Germany; and Vienna in Austria. In each city, we had two distinct applicant addresses - one shown with a red triangle, the other with a yellow diamond. Crosses (in different colors for different cities) show the firm addresses. Figure A4 provides the respective information for commuting distances up to 100 km. Figures 3 and A5 magnify the perspective on individual cities and show firm and applicant addresses for each city separately.

4.2 Probability of being invited to a job interview

Our outcome variable of interest is the probability of being invited to a job interview. Table 1 shows interview invitation rates by gender for applicants residing up to (and including) 50 km from the company to which they apply. We find that invitation rates are substantially lower for men (11%) than for women (21%) in the female-dominated occupations that we examine. This aligns with the experimental literature, which shows that men often face discrimination in female-dominated fields, while women are frequently discriminated against in male-dominated jobs (Adamovic and Leibbrandt, 2023; Galos and Coppock, 2023; Yavorsky, 2019; Weichselbaumer, 2004). The differential treatment by gender is particularly striking in Austria, where female applicants experience a callback rate of 19% compared to only 6% for men, although Switzerland and Germany also show considerable gender gaps. The data additionally show higher invitation rates for accounting vacancies, at 25% for women and 15% for men, than for secretarial vacancies, at 17% and 7%, respectively. Like in Becker, Fernandes, and Weichselbaumer (2019), the callback rates are very similar for different family types, when we consider all vacancies jointly.

Table 1: Interview invitation rates for the applicants

	Female		Male	
	Callback Rate (in %)	Obs.	Callback Rate (in %)	Obs.
All types, countries, occupations	20.68	4517	10.78	2487
Germany	22.49	2579	12.46	1565
Switzerland	17.93	1461	8.81	647
Austria	19.29	477	5.82	275
Accountant	25.23	2128	15.08	1227
Secretary	16.62	2389	6.59	1260
Single No Kids	20.26	1002	11.5	426
Married No Kids	19.44	993	9.0	411
Married 2 Young Kids	20.35	791	11.84	608
Married 2 Old Kids	22.95	732	12.06	630
No Info on Family Status	20.92	999	8.25	412

Notes: Callback rates represent the percentage of applicants who were invited for an interview in a correspondence testing field experiment conducted between March 2013 and June 2015. Each firm received two applications with identical human capital (work experience and education) and randomized gender and family attributes. Each application package included a cover letter, résumé, reference letter, and educational certificates. Résumé elements such as candidate photo, name, and application template (determining visual style of the application as well as personal details) were randomized.

4.3 Control Variables

In the following, we estimate the probability of an interview invitation as a function of driving distance, for men and women separately. We add controls for family type, city and time, application characteristics, and firm characteristics.

The city controls include indicators for Basel, Zurich, Berlin, Cologne, Frankfurt, Hamburg, Stuttgart, Munich, and Vienna, with Bern as the reference city. They absorb persistent differences across local labor markets and economic environments that may affect interview invitation rates. Time controls account for the quarter and year in which each application was sent.

We also control for application characteristics such as occupation (accountant versus secretary), the template and photo used in a specific application, the quality of the application[14] and the quality of the fit between our applicant's profile and a particular vacancy.[15]

Firm-level controls include the geographical scope of operations – distinguishing among firms active locally, nationally, and internationally – and firm size, ranging from small firms with 1-20 employees to large firms with more than 1,000 employees. We additionally control for the firm's broad field of economic activity, using indicators for the public sector, trade, manufacturing, and services. Finally, we include an indicator for whether the job advertisement explicitly mentions an existing anti-discrimination hiring policy; this helps account for the possibility that firms that publicly signal a commitment to anti-discrimination follow systematically different hiring practices.

5. Results

As pointed out before, the existing literature largely attributes the observed gender commuting gap to supply-side factors, such as women's preferences for shorter commutes or household constraints that limit the distances women are willing to travel. Our experimental design allows us to identify a demand-side component of this gap. Because employers receive applications from fictitious candidates with comparable qualifications, any systematic relationship between applicants' residential distance and interview invitations reflects employer-side discrimination rather than applicants' own job-search behavior. We therefore examine whether employers penalize otherwise comparable applicants for living farther away, and whether this penalty differs by gender.

Table 2 presents the results from a linear probability model estimating the likelihood that an applicant receives an interview invitation as a function of driving distance and family type, with additional control variables being added sequentially from column 2 onward. Panel A shows the results for women. Column 1 of Panel A reports results without controls, showing a coefficient for distance of -0.0029 for females, which is statistically significant at the 1% level. This coefficient represents the distance gradient per km and implies that, for every 10 kilometers a woman lives farther away from the workplace, her chance of being invited to a job interview decreases by 2.9 percentage points. Given that the mean invitation rate for females in our sample is 20.7%, this effect is equivalent to a 14% reduction in invitation rates. Columns (2) through (4) increasingly add different sets of controls. The negative relationship between commuting distance and interview invitations remains statistically significant at the 1% level in all specifications. Including city and time controls (column (2)) reduces the magnitude of the effect, but even with the full set of controls (column (4)) it still amounts to -0.0018, an 8.7%

[14]We considered an application to be of high quality, when it included IT and English language certificates.

[15]Three dummy variables ('good', 'average', and 'bad' fit) capture how well the set of fixed skills possessed by our applicants matched the requirements of each specific job ad answered.

reduction in invitation rates per additional 10 km of commuting distance. Panel B shows the results for male applicants, for whom no statistically significant effect of commuting distance is observed. Appendix Table B1 reports the corresponding pooled specification. The interaction between female gender and driving distance is negative and statistically significant; in the fully controlled specification, the coefficient is –0.0023, with a standard error of 0.0007, confirming that the distance gradients differ by gender. Consistent with Becker, Fernandes, and Weichselbaumer (2019), considering all vacancies jointly, we find no main effect of family status on callback rates for either men or women.

Table 2: Probability of interview invitation by gender

Panel A: Female Applicants

	(1)	(2)	(3)	(4)
Driving distance in km	-0.0029***	-0.0020***	-0.0020***	-0.0018***
	(0.0005)	(0.0005)	(0.0005)	(0.0006)
Married, no kids	-0.0073	-0.0055	-0.0073	-0.0095
	(0.0176)	(0.0176)	(0.0174)	(0.0174)
Married, 2 young kids	-0.0024	-0.0001	-0.0055	-0.0072
	(0.0194)	(0.0193)	(0.0192)	(0.0192)
Married, 2 old kids	0.0270	0.0271	0.0286	0.0267
	(0.0204)	(0.0203)	(0.0202)	(0.0202)
No info on family status	0.0068	0.0047	0.0065	0.0052
	(0.0182)	(0.0182)	(0.0182)	(0.0182)
Mean of dependent variable	0.207	0.207	0.207	0.207
City and time controls		Yes	Yes	Yes
Applicant controls			Yes	Yes
Firm controls				Yes
Observations	4502	4502	4502	4502
R-squared	0.008	0.020	0.040	0.042

Panel B: Male Applicants

	(1)	(2)	(3)	(4)
Driving distance in km	-0.0003	0.0000	-0.0001	0.0003
	(0.0005)	(0.0006)	(0.0006)	(0.0006)
Married, no kids	-0.0251	-0.0251	-0.0220	-0.0234
	(0.0219)	(0.0217)	(0.0214)	(0.0216)
Married, 2 young kids	0.0035	0.0017	0.0051	0.0048
	(0.0208)	(0.0208)	(0.0205)	(0.0205)
Married, 2 old kids	0.0066	0.0074	0.0115	0.0103
	(0.0206)	(0.0205)	(0.0203)	(0.0203)
No info on family status	-0.0327	-0.0342	-0.0282	-0.0308
	(0.0213)	(0.0211)	(0.0208)	(0.0208)
Mean of dependent variable	0.108	0.108	0.108	0.108
City and time controls		Yes	Yes	Yes
Applicant controls			Yes	Yes
Firm controls				Yes
Observations	2480	2480	2480	2480
R-squared	0.003	0.014	0.037	0.044

Notes: Standard errors (clustered at the company level) in brackets. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$. Controls include city (Basel, Zurich, Berlin, Cologne, Hamburg, Frankfurt, Munich, Stuttgart, Vienna, with Bern being the reference city), time (quarter and year sent), application characteristics (template, photo, occupation, application quality, applicant–vacancy fit), and firm characteristics (size, local/national/international, sector, anti-discrimination policy).

Taken together, Panels A and B show that the impact of distance on interview invitations reflects employer-side discrimination rather than applicants' own job-search behavior. Commuting distance is therefore not treated as a general productivity or reliability signal for *all* applicants, but as a penalty that applies specifically to *women*.

In Appendix B, we carry out several important robustness checks on these results. Table B2 shows that the distance effect is robust across alternative distance measures, including travel by public transport, walking, biking, and straight-line (geodesic) distance.[16] Another important check is the robustness of our findings to different distance thresholds. Table B3 shows that the negative impact of commuting distance on women remains quantitatively stable and statistically significant across cutoffs from 25 to 100 km, while it is statistically indistinguishable from zero for men. We also show that in our data, linearity is a good approximation to the commuting penalty.[17] Finally, Table B6 presents a jackknife exercise removing one city at a time, confirming that no single location drives the results, and Table B7 shows that the overall female distance effect remains stable when omitting each sector in turn.

5.1 Observed family status and household responsibilities

As noted above, much of the literature on supply-side factors affecting commuting times has relied on the "household responsibility hypothesis" (Hanson and Johnston (1985), Johnston-Anumonwo (1992)). This hypothesis emphasizes the time constraints women often face in heterosexual households because of the unequal division of domestic work, particularly childcare (e.g., Bütikofer, Karadakic, and Willén (2025), Borghorst, Mulalic, and van Ommeren (2024), Le Barbanchon, Rathelot, and Roulet (2021)). A related demand-side hypothesis is that employers use observed family characteristics to form expectations about how women will cope with a long commute, potentially resulting in statistical discrimination (Arrow (1973), Phelps (1972)), if they anticipate higher absenteeism, lower job satisfaction, or turnover.

Because our applications vary marital status and the presence and age of children, we can test whether the female distance penalty differs by these observed family characteristics. We therefore interact commuting distance with the different family profiles in Table 3.

If employers penalized distant female applicants mainly due to concerns about family responsibil-

[16] Distance remains irrelevant for men across transportation modes. For women, the public-transport coefficient is smallest in absolute value (-0.0013), likely because public transport routes are longer on average than walking, cycling, or driving, as they typically do not follow the shortest path between home and work.

[17] We test linearity by replacing distance with indicators for $0-5$ km (reference), $5-10$ km, $10-20$ km, $20-30$ km, $30-40$ km, and $40-50$ km. Results (Table B4) are approximately linear without controls (col. 1). In the full specification (col. 4), effects are linear up to 30 km and then plateau, implying some concavity. Since over 90% of commutes are under 30 km (Figure 1), a linear specification is a good approximation in our sample. A quadratic term in distance (Table B5) is not significant, further supporting linearity.

ities, we would expect the distance gradient to be strongest for mothers, especially those with young children. In fact, none of the interactions between commuting distance and family profile is statistically significant. We find no detectable variation in the female distance penalty by reported marital status or by the presence and age of children. Even single women (reference group) and women who do not report family information face a negative distance gradient.[18]

Table 3: Distance with family type interaction terms, female applicants

	(1)	(2)	(3)	(4)
Driving distance in km	-0.0036***	-0.0026***	-0.0023**	-0.0022**
	(0.0010)	(0.0010)	(0.0010)	(0.0010)
Driving distance in km × married, no kids	0.0012	0.0013	0.0010	0.0010
	(0.0013)	(0.0013)	(0.0013)	(0.0013)
Driving distance in km × married, 2 young kids	0.0002	0.0003	-0.0001	-0.0001
	(0.0014)	(0.0014)	(0.0014)	(0.0014)
Driving distance in km × married, 2 old kids	0.0023	0.0020	0.0019	0.0019
	(0.0016)	(0.0016)	(0.0016)	(0.0016)
Driving distance in km × no info	-0.0000	-0.0001	-0.0007	-0.0007
	(0.0014)	(0.0014)	(0.0014)	(0.0014)
Mean of dependent variable	0.207	0.207	0.207	0.207
City and time controls		Yes	Yes	Yes
Applicant controls			Yes	Yes
Firm controls				Yes
Family types	Yes	Yes	Yes	Yes
Observations	4502	4502	4502	4502
R-squared	0.009	0.020	0.040	0.043

Notes: Standard errors (clustered at the company level) in brackets. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$. Controls include city (Basel, Zurich, Berlin, Cologne, Hamburg, Frankfurt, Munich, Stuttgart, Vienna, with Bern being the reference city), application characteristics (template, photo, occupation, application quality, applicant–vacancy fit), firm characteristics (size, local/national/international, sector, anti-discrimination policy), and family types. Table B8 in the Appendix presents the same analysis for male applicants, where no significant effects are observed for driving distance or any interaction with family type.

These results do not rule out the household responsibility hypothesis as an explanation for women's *own* commuting choices. Instead, they show that the employer-side distance penalty is not concentrated among women whose applications report being married or having children.

We next examine potential explanations for the observed association between commuting distance and women's callback rates.

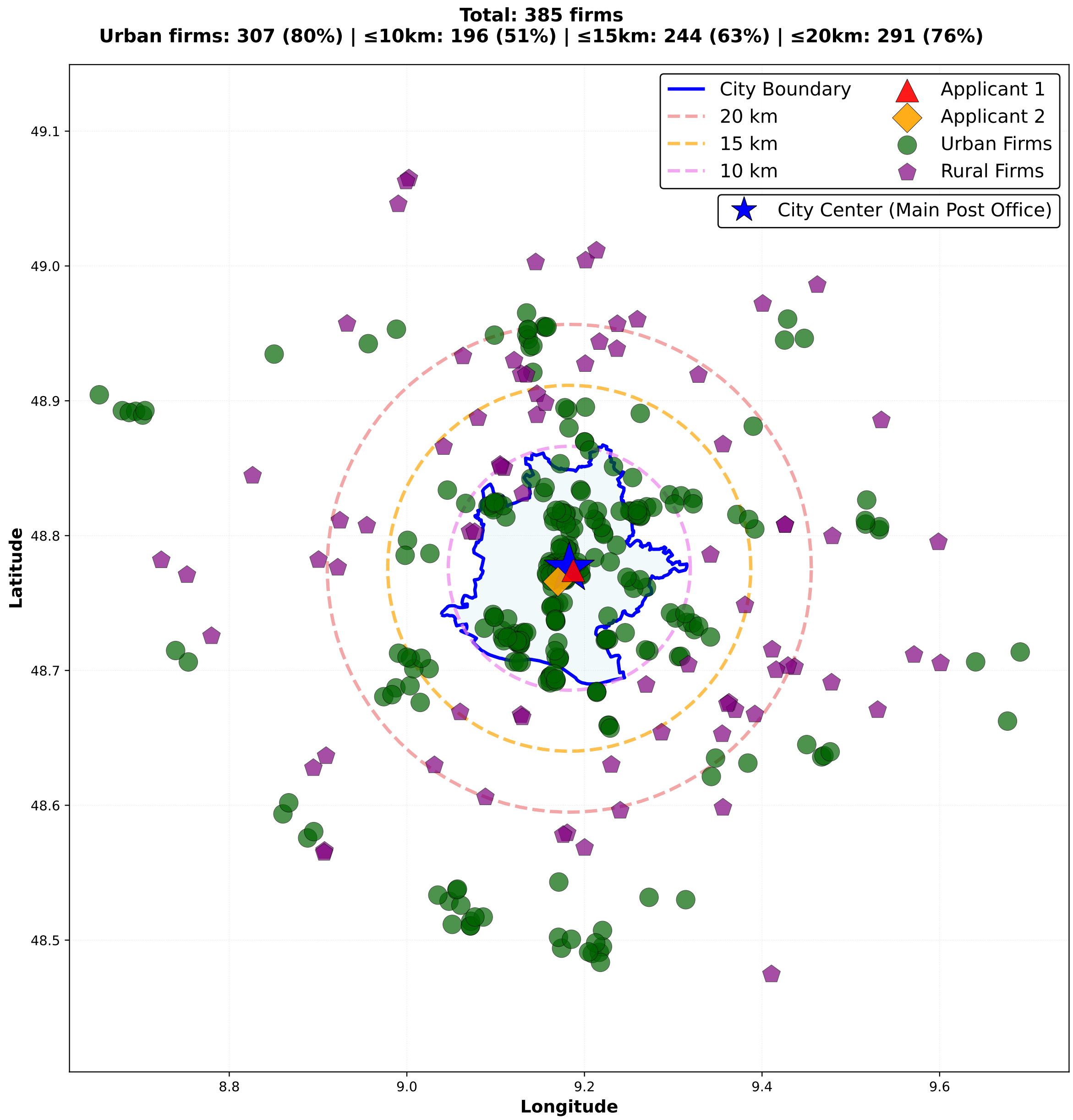
5.2 Employer location: urban and rural firms

Because our applicants' addresses are centrally located within each city, greater commuting distance may be correlated with the employer being based in a rural area. Rural employers may face different labor-market conditions and adopt different hiring practices; they may also hold more conservative views towards women. In that case, what appears as discrimination against female commuters could

[18] Also for male applicants, we find no significant effects of the interaction between driving distance and family type (Table B8).

instead be driven by other mechanisms – for example, rural employers' greater reluctance to hire women, particularly those from the city. It could also be that only rural employers discriminate against female commuters. For that reason, in the next step we disentangle the effect of commuting distance from any effect associated with an employer's rural location.

Figure 3: Employers in urban and rural municipalities in the vicinity of Stuttgart



Notes: This figure depicts the company addresses in Stuttgart and surroundings, distinguishing rural (brown pentagons) from urban locations (green circles). Companies were classified as urban if they were located within the official city boundary (based on administrative shapefiles) or outside the city boundary but in a municipality with at least 20,000 inhabitants. Appendix Figure A5 shows this urban/rural decomposition for the other 9 cities in our data.

Figure 3 distinguishes between employers located in a rural and urban setting for the case of Stuttgart, while Figure A5 in the Appendix shows this distinction for all cities in our data. Brown pentagons show a company located in a rural area, green circles show companies in an urban area.

We classified a firm as urban if it is located within the official city boundary (based on administrative shapefiles) or, if outside the boundary, in a municipality with at least 20,000 residents.[19] All remaining firms – those outside the focal city and in municipalities with fewer than 20,000 residents – were classified as rural. This procedure allows us to distinguish between rural locations and core urban areas, the latter including nearby towns that are functionally urban.

For applicants in Stuttgart (Figure 3), 307 (80%) out of the 385 firms we have contacted are classified as urban. Most of these are located within the city boundary (blue line), but some green circles outside Stuttgart represent firms in nearby urban municipalities like Ludwigsburg (90,000+ inhabitants) or Esslingen (95,000+ inhabitants). Most importantly, we have variation with regard to more distant employers concerning their rural and urban environment, allowing us to separate the effects of distance from those of rurality.

Table 4: Probability of interview invitation for females with urban/rural controls

	(1)	(2)	(3)	(4)
Driving distance in km	-0.0030***	-0.0016**	-0.0015**	-0.0014**
	(0.0006)	(0.0007)	(0.0007)	(0.0007)
Rural location	-0.0171	-0.0161	-0.0210	-0.0185
	(0.0361)	(0.0385)	(0.0376)	(0.0379)
Driving distance × Rural	0.0005	-0.0002	-0.0002	-0.0003
	(0.0013)	(0.0013)	(0.0013)	(0.0013)
Married, no kids	-0.0072	-0.0056	-0.0074	-0.0096
	(0.0176)	(0.0175)	(0.0174)	(0.0174)
Married, 2 young kids	-0.0022	-0.0000	-0.0055	-0.0073
	(0.0194)	(0.0193)	(0.0192)	(0.0192)
Married, 2 old kids	0.0270	0.0268	0.0283	0.0263
	(0.0204)	(0.0203)	(0.0202)	(0.0202)
No info on family status	0.0068	0.0046	0.0064	0.0051
	(0.0182)	(0.0182)	(0.0182)	(0.0182)
Mean of dependent variable	0.207	0.207	0.207	0.207
City and time controls		Yes	Yes	Yes
Applicant controls			Yes	Yes
Firm controls				Yes
Observations	4502	4502	4502	4502
R-squared	0.009	0.020	0.040	0.043

Notes: Standard errors (clustered at the company level) in brackets. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$. Sample restricted to locations $\leq$ 50 km. Controls include city (Basel, Zurich, Berlin, Cologne, Hamburg, Frankfurt, Munich, Stuttgart, Vienna, with Bern being the reference city), time (quarter and year sent), application characteristics (template, photo, occupation, application quality, applicant–vacancy fit), and firm characteristics (size, local/national/international, sector, anti-discrimination policy). Table B9 reports the results for male candidates.

In Table 4 we now include an indicator for the rural location of an employer and its interaction with

[19]For firms outside city boundaries, we extracted the municipality name from their address and matched it to official population data from Switzerland, Germany, and Austria.

commuting distance. The female distance gradient remains negative and statistically significant, while the interaction between distance and rural location is small and statistically insignificant. Our result that female commuters are penalized therefore does not appear to be driven by differential treatment by rural employers.[20]

5.3 Labor market tightness

Another possibility is that employers interpret commuting distance differently depending on local labor-market conditions. In a tighter labor market, employers may expect applicants to have greater opportunities to find work closer to home and therefore to be less likely to accept or remain in a distant job. We examine this possibility by interacting commuting distance with a city-level measure of labor-market tightness.[21]

Table 5: Labor market tightness, female applicants

	(1)	(2)	(3)	(4)
Driving distance in km	-0.0031**	-0.0026*	-0.0030**	-0.0030**
	(0.0012)	(0.0013)	(0.0013)	(0.0013)
Labor market tightness	0.2448	0.3259	0.3027	0.2861
	(0.2871)	(0.5915)	(0.6460)	(0.6450)
Driving distance in km × labor market tightness	0.0015	0.0076	0.0131	0.0153
	(0.0142)	(0.0157)	(0.0158)	(0.0158)
Mean of dependent variable	0.207	0.207	0.207	0.207
City and time controls		Yes	Yes	Yes
Applicant controls			Yes	Yes
Firm controls				Yes
Family types	Yes	Yes	Yes	Yes
Observations	4502	4502	4502	4502
R-squared	0.008	0.019	0.039	0.042

Notes: Standard errors (clustered at the company level) in brackets. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$. Controls include city (Basel, Zurich, Berlin, Cologne, Hamburg, Frankfurt, Munich, Stuttgart, Vienna, with Bern being the reference city), time (quarter and year sent), application characteristics (template, photo, occupation, application quality, applicant–vacancy fit), and firm characteristics (size, local/national/international, sector, anti-discrimination policy). Table B10 presents this table for male candidates.

Table 5 shows that neither labor-market tightness nor its interaction with commuting distance is statistically significant. The negative distance gradient for female applicants remains.[22]

[20] For male applicants, we likewise find no significant distance gradient or differential effect between rural and urban employers; see Table B9.

[21] Labor-market tightness is calculated at a monthly frequency as the number of open positions per city divided by the number of unemployed people. The number of unemployed people is approximated as the product of the city unemployment rate and city population.

[22] For male applicants, neither labor-market tightness nor its interaction with commuting distance is statistically significant, and there is also no significant distance gradient; see Table B10.

5.4 Heterogeneity by part-time status

Previous scholars (e.g., Madden (1981), McQuaid and Chen (2012)) have highlighted that lower wages as well as shorter hours worked by women may play a role in the gender commuting gap. Part-time work (which is particularly prevalent among women in the German-speaking countries) shifts the balance between earnings and commuting costs and therefore may make long commutes less acceptable to workers. As a result, employers may fear that a part-time job that requires long commutes will ultimately be unattractive. In the next step, we therefore differentiate between applications to full- or part-time jobs by including an interaction term "distance×part-time" in our linear probability model. We classify a job as part-time if the advertised workload is at most four days of work ($\leq$ 80% of full-time).

Table 6: Probability of interview invitation, part-time × distance, female applicants

	(1)	(2)	(3)	(4)
Driving distance in km	-0.0024***	-0.0013**	-0.0013**	-0.0011*
	(0.0006)	(0.0006)	(0.0006)	(0.0006)
Driving in km × Part-time	-0.0021*	-0.0023**	-0.0025**	-0.0026**
	(0.0011)	(0.0011)	(0.0011)	(0.0011)
Part-time	0.0235	0.0361	0.0305	0.0326
	(0.0244)	(0.0245)	(0.0242)	(0.0243)
Mean of dependent variable	0.207	0.207	0.207	0.207
City and time controls		Yes	Yes	Yes
Applicant controls			Yes	Yes
Firm controls				Yes
Family types	Yes	Yes	Yes	Yes
Observations	4502	4502	4502	4502
R-squared	0.009	0.020	0.041	0.044

Notes: Standard errors (clustered at the company level) in brackets. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$. Controls include city (Basel, Zurich, Berlin, Cologne, Hamburg, Frankfurt, Munich, Stuttgart, Vienna, with Bern being the reference city), application characteristics (template, photo, occupation, application quality, applicant–vacancy fit), firm characteristics (size, local/national/international, sector, anti-discrimination policy), and family types. Table B11 shows the results for males. Again, we do not observe any distance penalty for males.

Table 6 shows that the distance penalty for female applicants is larger for part-time vacancies. In the fully controlled specification, the distance gradient for full-time positions is -0.0011 per kilometer, and the additional distance gradient for part-time positions is -0.0026. The estimates therefore imply a total distance effect of approximately -0.0037 per kilometer for part-time vacancies. Nevertheless, the penalty is also clearly present among applicants to full-time positions, which represent our reference group.

While in German-speaking countries significantly more women than men hold part-time jobs, in our experimental setting men and women applied to part-time vacancies with equal probabilities. Appendix

Table B11 shows no distance gradient for male applicants applying for either full- or part-time positions. However, men are less likely to be invited for part-time than for full-time positions, potentially because male part-time employment violates the gender norm of the male breadwinner.

5.5 Heterogeneity by firm size

It has sometimes been found that hiring discrimination is larger in small firms (see, e.g., Kaas and Manger (2012)). One possible reason is that larger firms have a human resources department with qualified staff trained not to discriminate. In our case, it could additionally be that employers in small and medium-sized firms are particularly concerned about potential disruptions due to long distance commuters, as they often have only one or two secretaries or accountants, with no possibility of substituting if someone is unable to make it to work or decides to leave the job.

To examine heterogeneity by firm size, we grouped firms into bins as a function of the number of employees. We considered four bins with employment values in the following intervals: $1-20$, $21-100$, $101-500$, or 500+, with the last bin capturing firms with more than 500 employees.

The point estimates in Table 7 are negative and statistically significant among firms with up to 100 employees, but close to zero among larger firms. The largest estimate is found among firms with 1-20 employees, where an additional 10 km of commuting distance is associated with a 3.7 percentage-point reduction in the invitation probability. These estimates suggest that the female distance penalty is concentrated among smaller firms, whereas men do not face a distance penalty at any firm size (Table B12).

Table 7: Probability of interview invitation for females, by firm size (employees)

	1-20	21-100	101-500	500+
Driving distance in km	-0.0037***	-0.0024***	-0.0003	-0.0005
	(0.0013)	(0.0009)	(0.0010)	(0.0014)
Mean of dependent variable	0.209	0.217	0.192	0.206
Applicant, city, time and firm controls	Yes	Yes	Yes	Yes
Family types	Yes	Yes	Yes	Yes
Observations	938	1557	1222	785
R-squared	0.086	0.040	0.073	0.080

Notes: Standard errors (clustered at the company level) in the brackets.
* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$. Controls include city (Basel, Zurich, Berlin, Cologne, Frankfurt, Hamburg, Stuttgart, Munich, and Vienna, with Bern being the reference city), time (quarter and year sent), application characteristics (template, photo, occupation, application quality, applicant–vacancy fit), firm characteristics (local/national/international, sector, anti-discrimination policy), and family types. Appendix Table B12 shows the results for males by firm size.

6. Discussion and conclusion

Using a large-scale correspondence test covering three different countries (Germany, Switzerland, and Austria), we identified a clear gender-specific commuting-distance penalty in hiring. Each additional 10 km of driving distance reduces women's probability of receiving an interview invitation by 1.8 percentage points (approximately 9 percent of the mean female invitation rate), while commuting distance has no corresponding effect for male applicants. The result is robust to alternative distance measures and thresholds, and persists when accounting for employers' rural versus urban location and local labor-market tightness. The point estimates are larger for part-time vacancies and among smaller firms. This concentration among smaller firms is consistent with their potentially greater reliance on informal screening procedures.

The female distance penalty does not vary detectably with applicants' reported marital status or the presence and age of children. It therefore does not appear to be concentrated among women whose family situation may be perceived as entailing greater household responsibilities. This evidence, however, does not rule out the possible importance of household responsibilities as potential drivers of women's *own* commuting choices, nor does it preclude employers from applying broader gender stereotypes about household constraints without conditioning on the family information reported in the application. Employers may also interpret a long commute as a signal of a lower probability of accepting the job, weaker commitment, greater absenteeism, or higher turnover, and apply these beliefs differently to women and men. They may further believe that women are, on average, less spatially mobile than men and endorse stereotypes that associate driving with masculinity.

A further possibility is that employers anticipate offering women lower wages than men (or expect women's reservation wages to be lower) and infer that, at lower pay levels, a long commute is especially unattractive. Under this interpretation, the interaction of low expected pay and long distance reduces the perceived likelihood that distant female applicants will accept or remain in the job, leading employers to discount such applications. This interpretation also aligns with our finding that larger firms — which typically offer generally higher wages — do not exhibit discrimination against female commuters.

Another possibility is that employers use commuting distance as a way to decide among numerous and otherwise comparable applicants, a form of "tiebreaking discrimination." Because the occupations studied are female dominated, employers are likely to receive considerably more applications from women than from men. When faced with a large number of similarly qualified female candidates, employers may therefore have greater reason to rely on secondary characteristics, such as commuting distance, to reduce the cost of screening and ranking applicants. Under this interpretation, distance functions as a tiebreaker rather than as a characteristic that employers regard as inherently undesirable. This mechanism could make distance more salient among female applicants if employers face a larger pool of otherwise similar women. However, a generic tiebreaking mechanism would also tend to reduce the pool of male applicants whenever further ranking among men is required. It therefore does not by itself explain the absence of a male distance gradient. In addition, we do not observe firms' applicant pools, the number of candidates considered suitable, or their selection procedures. We therefore view tiebreaking as one possible interpretation of the gender difference rather than as an identified mechanism.

Whatever the precise mechanisms, the central result is clear: employers screen otherwise comparable female and male applicants differently on the basis of commuting distance, restricting women's access to geographically broader labor markets. Thus, the gender commuting gap reflects not only women's own commuting choices and constraints, but also a demand-side contribution stemming from employers' hiring decisions.

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So Far Away?

Hiring Discrimination against Female Commuters

Appendix

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A. Data Appendix

Figure A1: Example candidate

Notes: This figure shows a stylized, non-identical reconstruction of the résumé header for a fictitious applicant based in Hamburg. The portrait depicted here is AI-generated, and the name, address, telephone number, email address, birth details, and family information are entirely fictional. The figure illustrates the type of personal information included in the experimental applications. In the experiment, résumé elements such as the candidate's photograph, name, family profile, and application template were randomized.

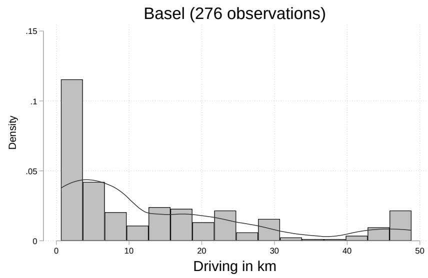
Table A1: Summary of observations, before and after data cleaning

	Female		Male		Total
	Full-Time	Part-Time	Full-Time	Part-Time	
(1) Original sample	4245	1332	2445	647	8669
(2) Observations with company addresses	3873	1210	2228	591	7902
(3) Observations with driving distance $\leq$ 50 km	3416	1101	1961	526	7004
Loss (2) relative to (1)	8.8%	9.2%	8.9%	8.7%	8.8%
Loss (3) relative to (1)	19.5%	17.3%	19.8%	18.7%	19.2%

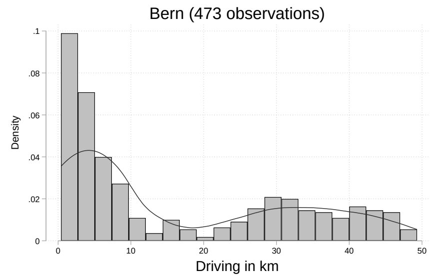
Notes: The table shows the sample size at each stage of data cleaning (starting with the original sample used by Becker, Fernandes, and Weichselbaumer (2019)), with observations categorized by gender and employment type (full-time, part-time). The initial sample was reduced by excluding observations lacking valid company addresses, followed by a further reduction to observations within a 50 km driving distance from the applicant. The final two rows indicate the percentage of observations lost at each stage.

Figure A2: Histograms of driving distance: 8 a.m. commute, by city

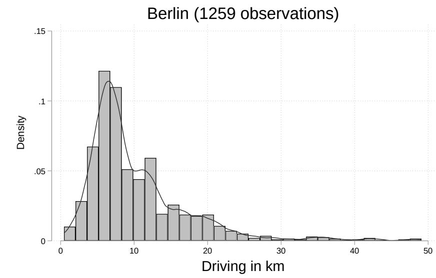
(a) Basel



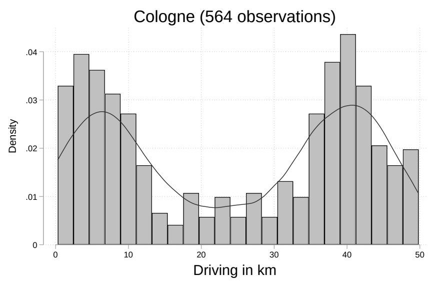
(b) Bern



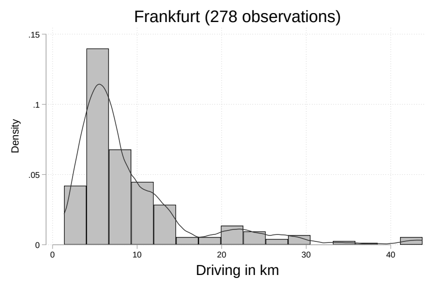
(c) Berlin



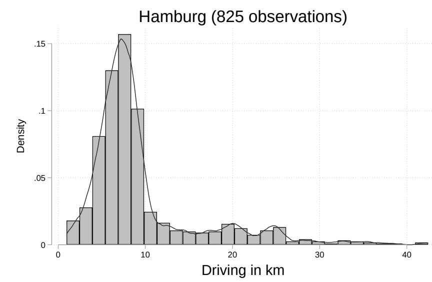
(d) Cologne



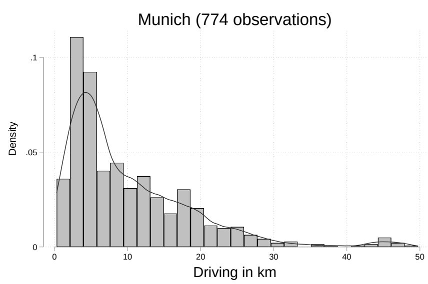
(e) Frankfurt



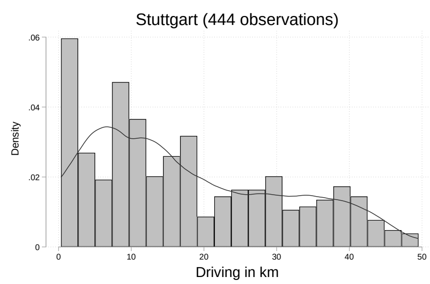
(f) Hamburg



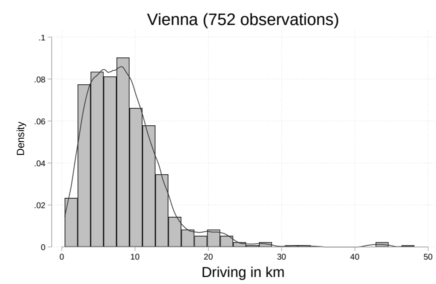
(g) Munich



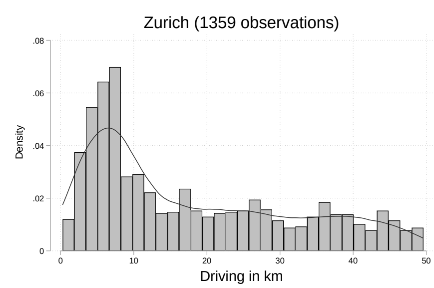
(h) Stuttgart



(i) Vienna



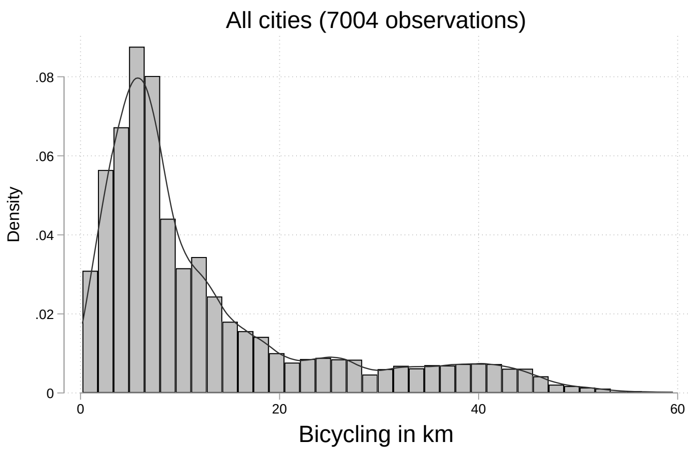
(j) Zurich



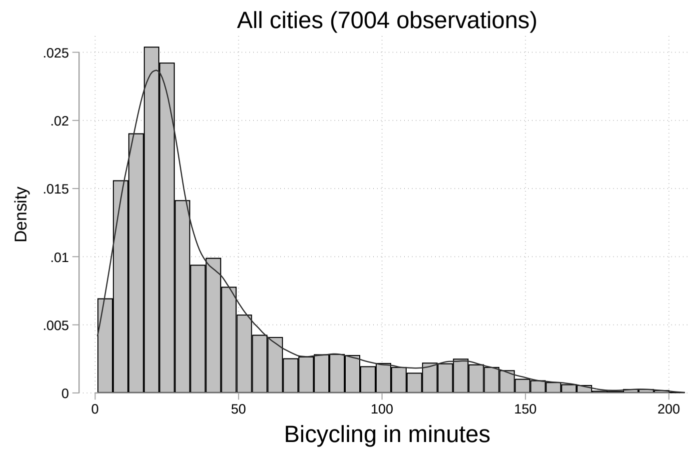
Notes: This figure presents histograms of driving distance for an 8 a.m. Monday trip across various cities. The driving distance was calculated based on candidates' home addresses and firm locations listed in job advertisements, using Google Maps. Panels (a) to (j) display the histograms of driving distances in kilometers for Basel, Bern, Berlin, Cologne, Frankfurt, Hamburg, Munich, Stuttgart, Vienna, and Zurich, respectively. Most cities exhibit a roughly log-normal distribution. However, Cologne has a bimodal distribution, likely due to its location within the Rhein-Ruhr metropolitan area, where firms from nearby cities like Düsseldorf (approximately 40 km away) advertise jobs to applicants in Cologne. Bern, Zurich and Stuttgart are associated with longer commuting distances, possibly due to good local public transportation networks.

Figure A3: Histograms of Distance and Duration by Transportation Type

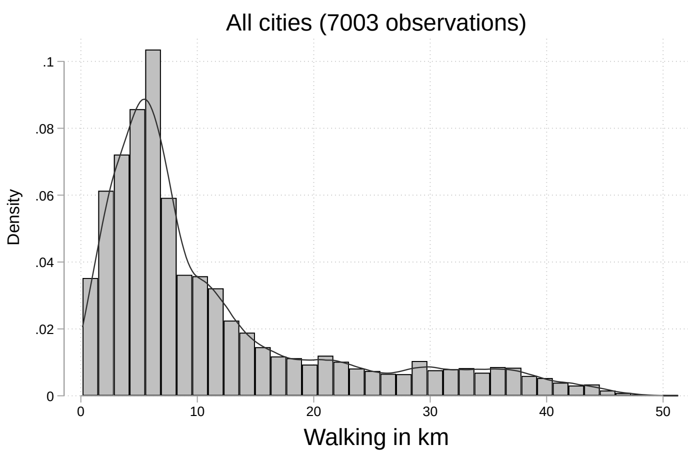
(a) Distance Cycling



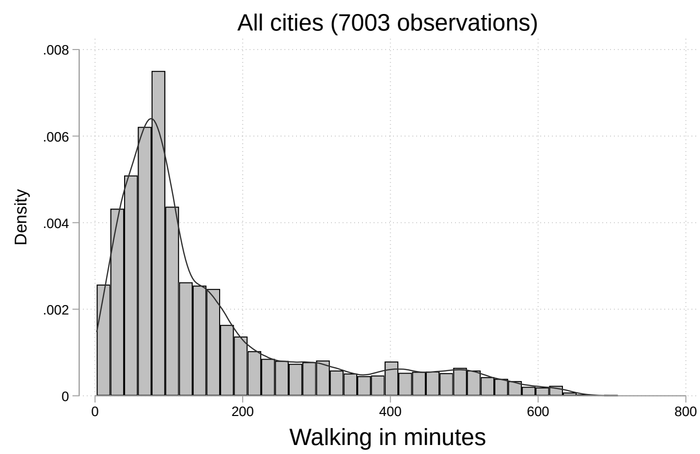
(b) Duration Cycling



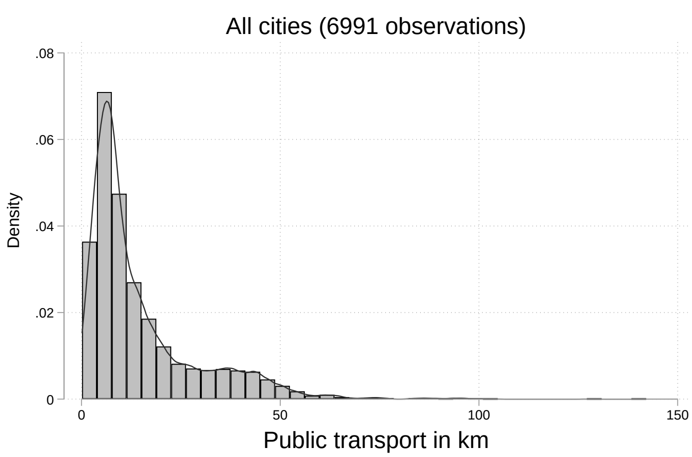
(c) Distance Walking



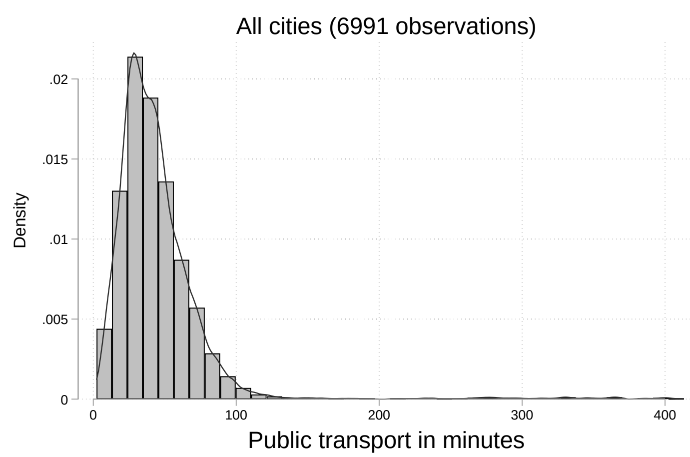
(d) Duration Walking



(e) Distance Public Transport

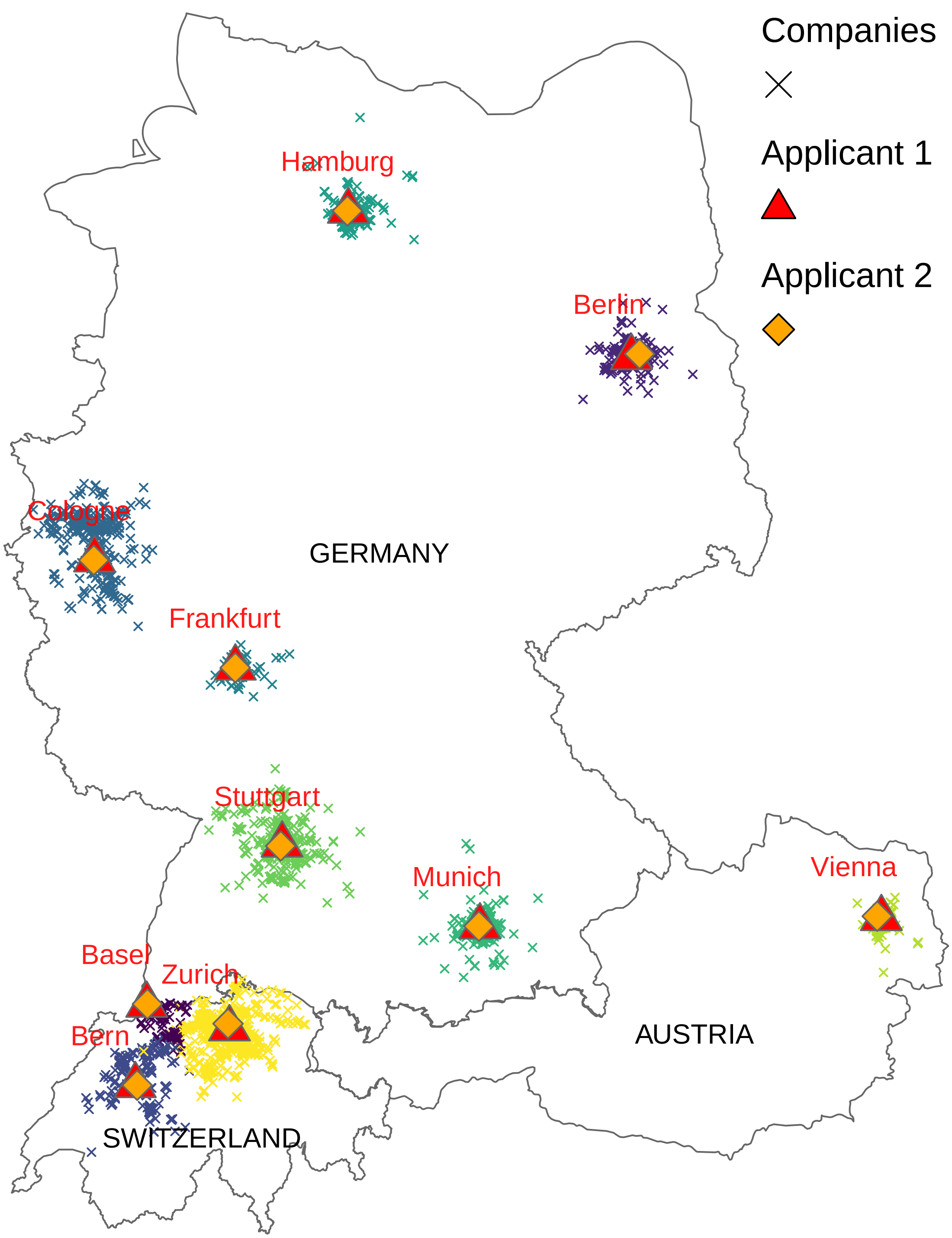


(f) Duration Public Transport



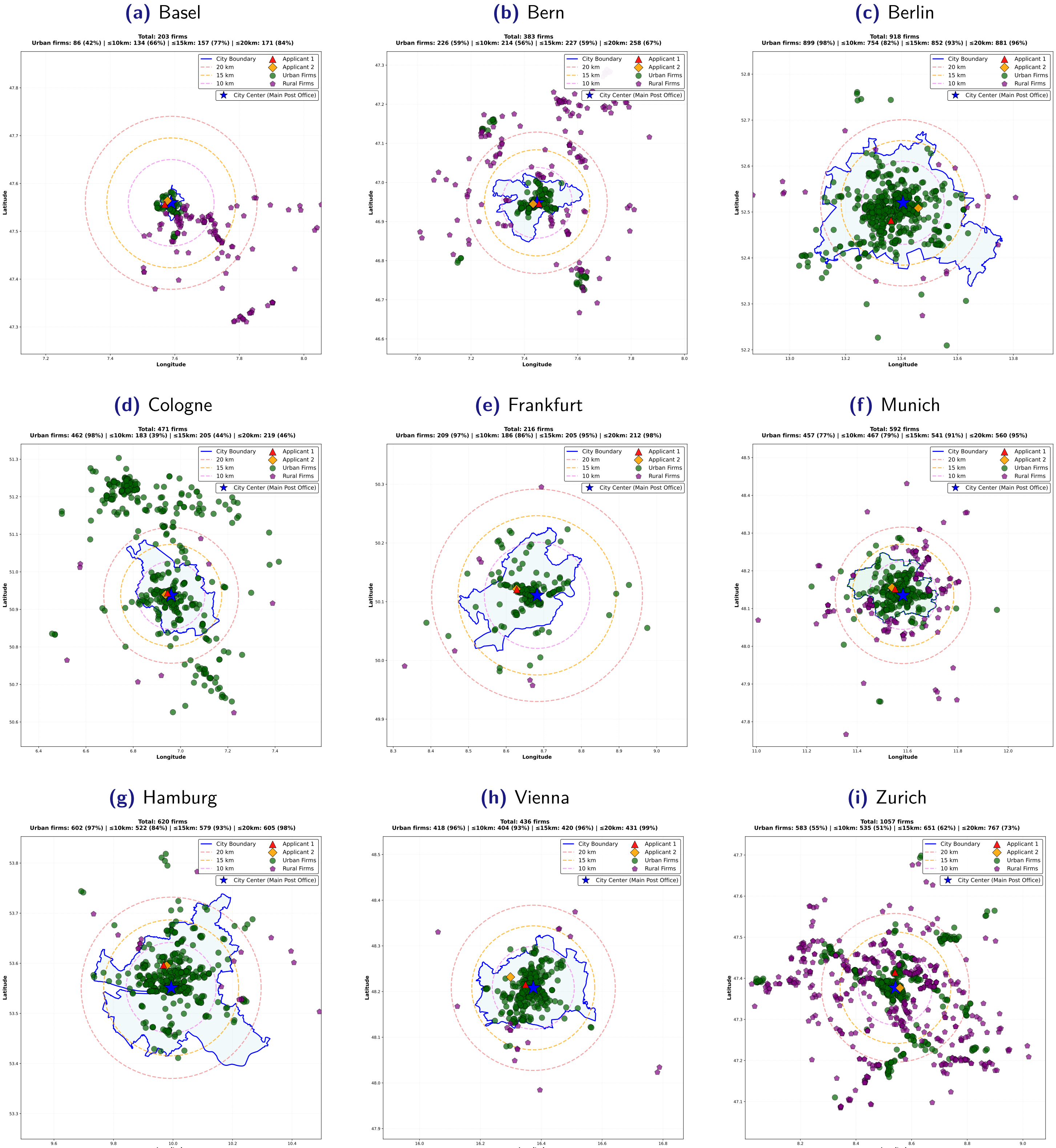
Notes: This figure presents histograms of distance and duration for an 8 a.m. Monday commute. Distances and durations were calculated based on candidates' home addresses and firm locations listed in job advertisements, using Google Maps. Panels (a) and (b) show cycling distance and duration, panels (c) and (d) walking distance and duration, and panels (e) and (f) public transport distance and duration.

Figure A4: Applicants and firms across countries and cities, driving distance ≤100 km



Notes: This map shows the applicant and company addresses for the different cities investigated, up to 100 km. The experiment was carried out in Basel, Bern and Zurich in Switzerland; Berlin, Cologne, Frankfurt, Hamburg, Munich, and Stuttgart in Germany; and Vienna in Austria. In each city, we have two distinct applicant addresses – one is shown with a red triangle, the other with a yellow diamond. Crosses (in different colors for different cities) show the firm addresses. Figure 2 reports the information for commuting distance up to 50 km.

Figure A5: Urban-rural classification: city shapefile boundaries with distance circles



Notes: This figure depicts the company addresses in different cities and surroundings, distinguishing rural (brown pentagons) from urban locations (green circles). Companies were classified as urban if they were located within the official city boundary (based on administrative shapefiles) or outside the city boundary but in a municipality with at least 20,000 inhabitants. Figure 3 shows this for Stuttgart.

B. Additional regression results

Table B1: Probability of interview invitation, gender × distance, all applicants

	(1)	(2)	(3)	(4)
Driving distance in km	-0.0003	0.0004	0.0002	0.0004
	(0.0005)	(0.0006)	(0.0006)	(0.0006)
Driving in km × Female	-0.0026***	-0.0025***	-0.0023***	-0.0023***
	(0.0007)	(0.0007)	(0.0007)	(0.0007)
Female	0.1370***	0.1395***	0.1131***	0.1135***
	(0.0136)	(0.0135)	(0.0159)	(0.0158)
Mean of dependent variable	0.172	0.172	0.172	0.172
City and time controls		Yes	Yes	Yes
Applicant controls			Yes	Yes
Firm controls				Yes
Family types	Yes	Yes	Yes	Yes
Observations	6982	6982	6982	6982
R-squared	0.022	0.032	0.051	0.053

Notes: Standard errors (clustered at the company level) in the brackets.
* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$. Controls include city (Basel, Zurich, Berlin, Cologne, Frankfurt, Hamburg, Stuttgart, Munich, and Vienna, with Bern being the reference city), time (quarter and year sent), application characteristics (template, photo, occupation, application quality, applicant–vacancy fit), firm characteristics (size, local/national/international, sector, anti-discrimination policy), and family types.

Table B2: Probability of interview invitation, all transport types

Panel A: Female Applicants

	(1)	(2)	(3)	(4)	(5)
Walking distance in km	-0.0021***				
	(0.0006)				
Bicycling distance in km		-0.0019***			
		(0.0005)			
Public transport distance in km			-0.0013***		
			(0.0005)		
Driving distance in km				-0.0018***	
				(0.0006)	
Straight line distance in km					-0.0024***
					(0.0007)
Mean of dependent variable	0.207	0.207	0.207	0.207	0.207
Applicant, city, time and firm controls	Yes	Yes	Yes	Yes	Yes
Family types	Yes	Yes	Yes	Yes	Yes
Observations	4492	4492	4492	4492	4492
R-squared	0.043	0.043	0.042	0.043	0.042

Panel B: Male Applicants

	(1)	(2)	(3)	(4)	(5)
Walking distance in km	0.0002				
	(0.0007)				
Bicycling distance in km		0.0002			
		(0.0006)			
Public transport distance in km			0.0002		
			(0.0005)		
Driving distance in km				0.0003	
				(0.0006)	
Straight line distance in km					0.0002
					(0.0008)
Mean of dependent variable	0.108	0.108	0.108	0.108	0.108
Applicant, city, time and firm controls	Yes	Yes	Yes	Yes	Yes
Family types	Yes	Yes	Yes	Yes	Yes
Observations	2476	2476	2476	2476	2476
R-squared	0.044	0.044	0.044	0.044	0.044

Notes: Standard errors (clustered at the company level) in brackets. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$. Controls include city (Basel, Zurich, Berlin, Cologne, Hamburg, Frankfurt, Munich, Stuttgart, Vienna, with Bern being the reference city), application characteristics (template, photo, occupation, application quality, applicant–vacancy fit), firm characteristics (size, local/national/international, sector, anti-discrimination policy), and family types.

Table B3: Probability of interview invitation, alternative driving distance thresholds

Panel A: Female Applicants

	$\leq$ 25 km	$\leq$ 50 km	$\leq$ 75 km	$\leq$ 100 km
Driving distance in km	-0.0033**	-0.0018***	-0.0022***	-0.0021***
	(0.0014)	(0.0006)	(0.0004)	(0.0003)
Mean of dependent variable	0.221	0.207	0.199	0.198
Applicant, city, time and firm controls	Yes	Yes	Yes	Yes
Family types	Yes	Yes	Yes	Yes
Observations	3703	4502	4792	4832
R-squared	0.044	0.042	0.045	0.046

Panel B: Male Applicants

	$\leq$ 25 km	$\leq$ 50 km	$\leq$ 75 km	$\leq$ 100 km
Driving distance in km	-0.0002	0.0003	0.0000	-0.0002
	(0.0013)	(0.0006)	(0.0004)	(0.0004)
Mean of dependent variable	0.109	0.108	0.106	0.105
Applicant, city, time and firm controls	Yes	Yes	Yes	Yes
Family types	Yes	Yes	Yes	Yes
Observations	2071	2480	2650	2674
R-squared	0.045	0.044	0.041	0.041

Notes: Standard errors (clustered at the company level) in brackets. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$. Controls include city (Basel, Zurich, Berlin, Cologne, Hamburg, Frankfurt, Munich, Stuttgart, Vienna, with Bern being the reference city), application characteristics (template, photo, occupation, application quality, applicant–vacancy fit), firm characteristics (size, local/national/international, sector, anti-discrimination policy), and family types.

Table B4: Linearity check, female applicants

	(1)	(2)	(3)	(4)
5-10 km driving distance	-0.0296*	-0.0249	-0.0280	-0.0271
	(0.0177)	(0.0183)	(0.0181)	(0.0182)
10-20 km driving distance	-0.0438**	-0.0422**	-0.0455**	-0.0432**
	(0.0208)	(0.0210)	(0.0207)	(0.0210)
20-30 km driving distance	-0.0872***	-0.0757***	-0.0775***	-0.0735***
	(0.0248)	(0.0249)	(0.0248)	(0.0254)
30-40 km driving distance	-0.1064***	-0.0656**	-0.0655**	-0.0632**
	(0.0262)	(0.0268)	(0.0263)	(0.0270)
40-50 km driving distance	-0.1234***	-0.0807***	-0.0798***	-0.0763***
	(0.0258)	(0.0261)	(0.0260)	(0.0265)
Mean of dependent variable	0.207	0.207	0.207	0.207
City and time controls		Yes	Yes	Yes
Applicant controls			Yes	Yes
Firm controls				Yes
Family types	Yes	Yes	Yes	Yes
Observations	4502	4502	4502	4502
R-squared	0.008	0.020	0.040	0.042

Notes: The commuting distance bin $0-5$ km is the reference category. Standard errors (clustered at the company level) in brackets. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$. Controls include city (Basel, Zurich, Berlin, Cologne, Hamburg, Frankfurt, Munich, Stuttgart, Vienna, with Bern being the reference city), application characteristics (template, photo, occupation, application quality, applicant–vacancy fit), firm characteristics (size, local/national/international, sector, anti-discrimination policy), and family types. Table B5 does an alternative check for linearity by including a quadratic term for distance.

Table B5: Probability of interview invitation, linearity check with quadratic distance term, female applicants

	(1)	(2)	(3)	(4)
Driving distance in km	-0.0039*	-0.0039*	-0.0045**	-0.0043**
	(0.0021)	(0.0021)	(0.0021)	(0.0021)
Driving distance in km^2	0.0000	0.0000	0.0001	0.0001
	(0.0000)	(0.0000)	(0.0000)	(0.0000)
Mean of dependent variable	0.207	0.207	0.207	0.207
City and time controls		Yes	Yes	Yes
Applicant controls			Yes	Yes
Firm controls				Yes
Family types	Yes	Yes	Yes	Yes
Observations	4502	4502	4502	4502
R-squared	0.009	0.020	0.040	0.043

Notes: Standard errors (clustered at the company level) in the brackets. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$. Controls include city (Basel, Zurich, Berlin, Cologne, Frankfurt, Hamburg, Stuttgart, Munich, and Vienna, with Bern being the reference city), time (quarter and year sent), application characteristics (template, photo, occupation, application quality, applicant–vacancy fit), firm characteristics (size, local/national/international, sector, anti-discrimination policy), and family types.

Table B6: Probability of interview invitation, jackknife by **city**

Panel A: Female Applicants

	No Basel	No Zurich	No Berlin	No Frankfurt	No Stuttgart	No Cologne	No Hamburg	No Munich	No Vienna
Driving distance in km	-0.0015***	-0.0018***	-0.0018***	-0.0018***	-0.0019***	-0.0026***	-0.0021***	-0.0016***	-0.0016***
	(0.0006)	(0.0007)	(0.0006)	(0.0006)	(0.0006)	(0.0006)	(0.0005)	(0.0006)	(0.0006)
Mean of dependent variable	0.203	0.221	0.202	0.203	0.207	0.214	0.204	0.199	0.208
Applicant, city, time and firm controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Family types	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	4324	3544	3715	4328	4215	4156	3998	4026	4025
R-squared	0.040	0.038	0.049	0.039	0.043	0.041	0.047	0.043	0.046

Panel B: Male Applicants

	No Basel	No Zurich	No Berlin	No Frankfurt	No Stuttgart	No Cologne	No Hamburg	No Munich	No Vienna
Driving distance in km	0.0003	0.0001	0.0004	0.0004	0.0004	0.0006	0.0002	0.0003	0.0004
	(0.0006)	(0.0007)	(0.0006)	(0.0006)	(0.0006)	(0.0007)	(0.0006)	(0.0006)	(0.0006)
Mean of dependent variable	0.106	0.116	0.101	0.108	0.108	0.109	0.105	0.103	0.114
Applicant, city, time and firm controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Family types	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	2388	2087	2008	2378	2323	2262	2161	2184	2205
R-squared	0.043	0.044	0.055	0.044	0.043	0.044	0.043	0.043	0.044

Notes: Standard errors (clustered at the company level) in the brackets.

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$. Controls include city (Basel, Zurich, Berlin, Cologne, Frankfurt, Hamburg, Stuttgart, Munich, and Vienna, with Bern being the reference city), time (quarter and year sent), application characteristics (template, photo, occupation, application quality, applicant–vacancy fit), firm characteristics (size, local/national/international, sector, anti-discrimination policy), and family types.

Table B7: Probability of interview invitation, jackknife by sector

(a) Panel A: Female Applicants

	No Service	No Manufacturing	No Trade	No Public
Driving distance in km	-0.0018**	-0.0020***	-0.0020***	-0.0017***
	(0.0009)	(0.0006)	(0.0006)	(0.0006)
Mean of dependent variable	0.193	0.213	0.205	0.208
Applicant, city, time and firm controls	Yes	Yes	Yes	Yes
Family types	Yes	Yes	Yes	Yes
Observations	1670	3661	3899	4276
R-squared	0.054	0.045	0.039	0.043

(b) Panel B: Male Applicants

	No Service	No Manufacturing	No Trade	No Public
Driving distance in km	0.0019**	-0.0004	0.0000	-0.0004
	(0.0009)	(0.0007)	(0.0007)	(0.0006)
Mean of dependent variable	0.081	0.114	0.111	0.110
Applicant, city, time and firm controls	Yes	Yes	Yes	Yes
Family types	Yes	Yes	Yes	Yes
Observations	858	2028	2179	2375
R-squared	0.073	0.048	0.036	0.042

Notes: Standard errors (clustered at the company level) in the brackets.
* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$. Controls include city (Basel, Zurich, Berlin, Cologne, Frankfurt, Hamburg, Stuttgart, Munich, and Vienna, with Bern being the reference city), time (quarter and year sent), application characteristics (template, photo, occupation, application quality, applicant–vacancy fit), firm characteristics (size, local/national/international, sector, anti-discrimination policy), and family types.

Table B8: Distance with family interaction terms, male applicants

	(1)	(2)	(3)	(4)
Driving distance in km	-0.0004	-0.0001	-0.0003	-0.0001
	(0.0015)	(0.0016)	(0.0016)	(0.0016)
Driving distance in km × married, no kids	0.0016	0.0016	0.0015	0.0017
	(0.0021)	(0.0021)	(0.0020)	(0.0020)
Driving distance in km × married, 2 young kids	0.0001	0.0001	0.0003	0.0006
	(0.0018)	(0.0018)	(0.0018)	(0.0018)
Driving distance in km × married, 2 old kids	-0.0005	-0.0003	-0.0002	0.0000
	(0.0018)	(0.0018)	(0.0018)	(0.0018)
Driving distance in km × no info	-0.0004	-0.0002	-0.0002	-0.0000
	(0.0019)	(0.0019)	(0.0019)	(0.0019)
Mean of dependent variable	0.108	0.108	0.108	0.108
City and time controls		Yes	Yes	Yes
Applicant controls			Yes	Yes
Firm controls				Yes
Family types	Yes	Yes	Yes	Yes
Observations	2480	2480	2480	2480
R-squared	0.003	0.014	0.038	0.044

Notes: Standard errors (clustered at the company level) in the brackets.

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$. Controls include city (Basel, Zurich, Berlin, Cologne, Frankfurt, Hamburg, Stuttgart, Munich, and Vienna, with Bern being the reference city), time (quarter and year sent), application characteristics (template, photo, occupation, application quality, applicant–vacancy fit), firm characteristics (size, local/national/international, sector, anti-discrimination policy), and family types.

Table B9: Probability of interview invitation for males, accounting for rural employers

	(1)	(2)	(3)	(4)
Driving distance in km	-0.0006	-0.0003	-0.0005	-0.0001
	(0.0006)	(0.0007)	(0.0007)	(0.0008)
Rural location (inc. urban outside key city)	-0.0368	-0.0210	-0.0226	-0.0177
	(0.0353)	(0.0369)	(0.0360)	(0.0363)
Driving distance × Rural	0.0015	0.0011	0.0014	0.0014
	(0.0014)	(0.0014)	(0.0014)	(0.0014)
Married, no kids	-0.0250	-0.0252	-0.0222	-0.0236
	(0.0218)	(0.0217)	(0.0214)	(0.0216)
Married, 2 young kids	0.0030	0.0014	0.0048	0.0046
	(0.0209)	(0.0208)	(0.0206)	(0.0206)
Married, 2 old kids	0.0060	0.0073	0.0114	0.0105
	(0.0206)	(0.0206)	(0.0204)	(0.0203)
No info on family status	-0.0328	-0.0342	-0.0281	-0.0305
	(0.0212)	(0.0211)	(0.0208)	(0.0208)
Mean of dependent variable	0.108	0.108	0.108	0.108
City and time controls		Yes	Yes	Yes
Applicant controls			Yes	Yes
Firm controls				Yes
Observations	2480	2480	2480	2480
R-squared	0.003	0.014	0.037	0.044

Notes: Standard errors (clustered at the company level) in brackets. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$. Sample restricted to locations $\leq$ 50 km. Controls include city (Basel, Zurich, Berlin, Cologne, Hamburg, Frankfurt, Munich, Stuttgart, Vienna, with Bern being the reference city), time (quarter and year sent), application characteristics (template, photo, occupation, application quality, applicant–vacancy fit), and firm characteristics (size, local/national/international, sector, anti-discrimination policy). Table 4 reports the results for female candidates.

Table B10: Labor market tightness, male applicants

	(1)	(2)	(3)	(4)
Driving distance in km	0.0013	0.0009	0.0009	0.0010
	(0.0013)	(0.0014)	(0.0014)	(0.0015)
Labor market tightness	0.3540	0.2843	0.2720	0.1503
	(0.2433)	(0.5174)	(0.5233)	(0.5256)
Driving distance in km × labor market tightness	-0.0199	-0.0109	-0.0123	-0.0081
	(0.0142)	(0.0152)	(0.0153)	(0.0157)
Mean of dependent variable	0.108	0.108	0.108	0.108
City and time controls		Yes	Yes	Yes
Applicant controls			Yes	Yes
Firm controls				Yes
Family types	Yes	Yes	Yes	Yes
Observations	2480	2480	2480	2480
R-squared	0.001	0.011	0.035	0.041

Notes: Standard errors (clustered at the company level) in brackets. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$. Controls include city (Basel, Zurich, Berlin, Cologne, Hamburg, Frankfurt, Munich, Stuttgart, Vienna, with Bern being the reference city), time (quarter and year sent), application characteristics (template, photo, occupation, application quality, applicant–vacancy fit), and firm characteristics (size, local/national/international, sector, anti-discrimination policy). Table 5 presents this table for female candidates.

Table B11: Probability of interview invitation, part-time × distance, male applicants

	(1)	(2)	(3)	(4)
Driving distance in km	-0.0004	-0.0002	-0.0003	0.0001
	(0.0006)	(0.0007)	(0.0007)	(0.0007)
Driving in km × Part-time	0.0004	0.0006	0.0008	0.0008
	(0.0012)	(0.0012)	(0.0012)	(0.0012)
Part-time	-0.0391*	-0.0394*	-0.0518**	-0.0536**
	(0.0218)	(0.0217)	(0.0223)	(0.0225)
Mean of dependent variable	0.108	0.108	0.108	0.108
City and time controls		Yes	Yes	Yes
Applicant controls			Yes	Yes
Firm controls				Yes
Family types	Yes	Yes	Yes	Yes
Observations	2480	2480	2480	2480
R-squared	0.005	0.016	0.040	0.047

Notes: Standard errors (clustered at the company level) in the brackets.
* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$. Controls include city (Basel, Zurich, Berlin, Cologne, Frankfurt, Hamburg, Stuttgart, Munich, and Vienna, with Bern being the reference city), time (quarter and year sent), application characteristics (template, photo, occupation, application quality, applicant–vacancy fit), firm characteristics (size, local/national/international, sector, anti-discrimination policy), and family types.

Table B12: Probability of interview invitation for males, by firm size (number of employees)

	1-20	21-100	101-500	500+
Driving distance in km	0.0021	-0.0002	0.0002	0.0006
	(0.0015)	(0.0011)	(0.0010)	(0.0014)
Mean of dependent variable	0.093	0.123	0.094	0.117
Applicant, city, time and firm controls	Yes	Yes	Yes	Yes
Family types	Yes	Yes	Yes	Yes
Observations	481	843	694	462
R-squared	0.087	0.087	0.096	0.064

Notes: Standard errors (clustered at the company level) in the brackets.
* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$. Controls include city (Basel, Zurich, Berlin, Cologne, Frankfurt, Hamburg, Stuttgart, Munich, and Vienna, with Bern being the reference city), time (quarter and year sent), application characteristics (template, photo, occupation, application quality, applicant–vacancy fit), firm characteristics (size, local/national/international, sector, anti-discrimination policy), and family types.