

DISCUSSION PAPER SERIES

IZA DP No. 15460

**Testing for Discrimination in Rental
Markets:
Experimental Evidence from the UK**

Martin Foureaux Koppensteiner
Tania Oliveira
Nikitha Rohith

JULY 2022

DISCUSSION PAPER SERIES

IZA DP No. 15460

Testing for Discrimination in Rental Markets: Experimental Evidence from the UK

Martin Foureaux Koppensteiner

University of Surrey and IZA

Tania Oliveira

University of Leicester

Nikitha Rohith

Coventry University

JULY 2022

Any opinions expressed in this paper are those of the author(s) and not those of IZA. Research published in this series may include views on policy, but IZA takes no institutional policy positions. The IZA research network is committed to the IZA Guiding Principles of Research Integrity.

The IZA Institute of Labor Economics is an independent economic research institute that conducts research in labor economics and offers evidence-based policy advice on labor market issues. Supported by the Deutsche Post Foundation, IZA runs the world's largest network of economists, whose research aims to provide answers to the global labor market challenges of our time. Our key objective is to build bridges between academic research, policymakers and society.

IZA Discussion Papers often represent preliminary work and are circulated to encourage discussion. Citation of such a paper should account for its provisional character. A revised version may be available directly from the author.

ISSN: 2365-9793

IZA – Institute of Labor Economics

Schaumburg-Lippe-Straße 5–9
53113 Bonn, Germany

Phone: +49-228-3894-0
Email: publications@iza.org

www.iza.org

ABSTRACT

Testing for Discrimination in Rental Markets: Experimental Evidence from the UK*

In this paper we provide novel insights on discrimination against immigrants in the UK rental market. We conducted a randomized-controlled trial close to a real-world setting where inquiries to view a property were made via phone inquiries with rental agencies and immigration background was signalled through non-UK accents. We document substantial discrimination against non-UK applicants with non-UK applicants having a 13 percent lower chance of securing a viewing for a rental. We also document substantial heterogeneous effects, with much more pronounced effects in local areas with a lower share of immigrants. We find that the background of agency managers or the composition of agency staff does not attenuate the effects.

JEL Classification: J15, K37, R30

Keywords: discrimination, rental market, immigration, right-to-rent, UK

Corresponding author:

Martin Foureaux Koppensteiner

University of Surrey

Guildford

GU2 7XH

UK

E-mail: m.koppensteiner@surrey.ac.uk

* We would like to thank Mark Hoekstra, Ingo Isphording, Michael Lovenheim, Francisco Martinez Mora, Jesse Matheson, Philip Oreopoulos, and seminar participants in Leicester, Coventry, and the RES annual meeting for very useful comments. We are grateful for financial support received from the British Academy/Leverhulme grant SG162046. The project also benefited from technical support through a University of Leicester ReSET software engineer position and from seed funding from the University of Leicester. AEA RCT Registry No. AEARCTR-0008426. The usual disclaimer applies.

1 Introduction

In the UK, over the past decade, responsibilities for immigration controls have been outsourced to the private sector or public sector organizations, not normally involved in dealing with such controls and form part of a ‘hostile environment’ intended to deter inwards migration (Crawford et al. (2020)).¹ An example of the private sector obliged to perform immigration controls concerns the UK rental market, where *right-to-rent* checks are required from landlords or their agents before letting a property to prospective tenants.² The law requires landlords to perform right-to-rent checks—which involve checking hundreds of variants of different passports, national IDs and visas, including inquiries with the home office, in case documents are held there, and documenting the checks—of any applicant irrespective of the suspected status. The administrative burden and the risk for heavy fines may introduce incentives for landlords and rental agents that may lead to more subtle forms of discrimination. For example, rental agents may give preference to prospective tenants that they suspect hold a British passport, removing the need for complicated checks and minimizing the risk for mistakes in the process, possibly leading to discrimination of prospective tenants with characteristics linked to immigrants. Housing has been one of the earliest areas studied when measuring discrimination in the economics literature. After the passage of the Civil Rights Act of 1968 in the US, popularly known as the Fair Housing Act, fair housing audits were used to identify racial discrimination in housing opportunities followed recently by a growing number of studies based on experimental settings using written communication, mainly email, to assess potential discrimination in rental markets.

In this paper, we systematically test for discrimination in the UK rental market in a new experimental setting. Different from previous papers, we designed a randomized controlled trial closer to real interactions between prospective tenants and rental agents: rather than relying on email correspondence where variation in the senders name or features in the composition of the inquiry signal different characteristics of the applicant, in our experiment we made inquiries by phone, where we allocated callers with different British English and foreign accents randomly

¹For example, the National Health Service (NHS) has the statutory obligation to establish whether people using their services are normally resident in the UK, and is required to charge ineligibles for any non-emergency treatment. It falls on the NHS trusts to establish eligibility and hence check immigration documentation in the absence of centrally provided ID cards. Similar immigration checks require UK Universities to check eligibility of their students to study in the UK throughout the entire period of their study (‘right-to-study’ checks). Failure to do so may lead to the revocation of the *UK Visa and Immigration Service* sponsor license of the University.

²If an undocumented immigrant is found to live in a property and the landlord failed to carry out sufficient checks, the landlord may be liable for a civil penalty of up to £3,000 or criminal proceedings in case of repeat failure of right-to-rent checks.

across standardized one-bedroom properties (and randomly allocated names consistent with their accent).³ To our knowledge this is the first study to test for (rental) discrimination based on caller accents indicating a migration background in phone inquiries. We independently validated voice samples of our callers in an Ethnicity Identification Survey using crowdworkers in Human Intelligence Tasks, confirming that the accents spoken by our callers were identifiable as native British-English speakers or otherwise. Our approach here is much closer to real inquiries in many cases made via phone to arrange for a viewing of a property, allowing us to test directly how a perceived immigrant status via an accent of the caller affects the chances to secure a viewing of an advertised property. Our callers followed a standardized telephone protocol, ensuring consistency across callers and across different properties inquired. Our callers then collected the response to their inquiry for a viewing and any conditions set for the viewing, as well as the date and time of the viewing. This setting is very close to real interactions between prospective tenants and estate agents, which in the vast majority of cases viewings are booked via telephone. In those calls applicants arrange for a suitable date and time and discuss any requirements for completing a rental contract ahead of the viewing, for example on the documents the agents require to completing the right-to-rent checks.

There is a substantial literature on discrimination in the market for rental properties. Early papers, mostly based on surveys from fair housing audits, concentrated on racial discrimination in the US context. In these audit studies, matched pairs of trained auditors, of different race but otherwise similar characteristics approach the same housing agent as potential tenant inquiring about a the same property. [Yinger \(1986\)](#) found that the rental agents in Boston informed black applicants almost 30 percent less frequently on the availability of housing compared to their white counterparts. [Page \(1995\)](#), [Roychoudhury and Goodman \(1996\)](#), [Ondrich et al. \(1999\)](#), [Choi et al. \(2005\)](#), [Ondrich et al. \(2000\)](#) and [Zhao et al. \(2006\)](#) provide further evidence on discrimination against minority applicants from audit studies across the US. A problem with audit studies is the assumption that auditors paired to the same property only differ in terms of a single characteristics, for example ethnic background, but not in terms of other characteristics, for example socio-economic background potentially signaled through hairstyle, clothes or body language. Furthermore, knowledge of being part of an experiment may also change the behaviour of auditors in lengthy interactions with estate agents, possibly leading to own beliefs about discrimination being

³The only other study that uses phone interaction in audit style settings is [Massey and Lundy \(2001\)](#), who test for discrimination against Black Americans in the US based on the claim of differences in speech patterns specific to race.

reflected in their interactions (Heckman and Siegelman, 1993; Heckman, 1998). With the advent of online platforms to advertise rental property, researchers exploited the opportunity to adjust experimental designs and respond to new forms of interaction between estate agents and potential tenants in email correspondence studies without face-to-face interaction. Mail and email correspondence papers allow to vary specific characteristics of the applicants, while ensuring that other information on the applicants is identical. Interaction via email also reduced cost of experimental settings, ensured a more consistent collection of responses, and allowed to expand testing for discrimination to a wider set of applicant characteristics. Papers have since tested for discrimination against ethnic and religious minorities (Ahmed and Hammarstedt (2008), Carpusor and Loges (2006), Baldini and Federici (2011), Hanson and Santas (2014), Bosch et al. (2010), Carlsson and Eriksson (2015), Gusciute et al. (2022)), sexual orientation (Ahmed and Hammarstedt (2009), Ahmed et al. (2008), Hellyer (2021)) and allowed for more complex experimental designs for example to study the role of information mitigating discrimination (Ahmed et al. (2010), Bosch et al. (2010), Ewens et al. (2014)).

The innovations introduced in the experimental setting in this study have a number of advantages over previous experimental studies on discrimination by combining some features of both methods, i.e. audit studies and email correspondence.

First, by calling rental agencies inquiring directly about a viewing for a property, this provides us with a much more tangible outcome, confirmed booking for a viewing, in contrast to email correspondence methods which use the response rate to an email inquiry as a outcome measure. Callback rates have been shown in the literature to underestimate discrimination compared to more relevant outcomes (Quillian et al. (2020)), hence the results reported in this paper likely better reflect true levels of discrimination. During the calls, we were also able to record any conditions set on the viewing, providing us with a qualitative measure of the strength of the booking, which we can use in the analysis when distinguishing between conditional and unconditional viewings.

Second, in contrast to audit studies, which are often based on very small samples, call inquiries provided us with an efficient way to run an experiment of sufficiently large scale to be able to investigate heterogeneity of results along a number of important margins, while directly addressing concerns with audit studies regarding the experimental setup and possible biases from auditor behavior. This means we can limit the signal about the potential foreign background of a potential tenant to the accents of the caller (and the name briefly mentioned at the beginning on the telephone call), and eliminate any other signals, intentional or unintentional, of the applicant.

Using this novel telephone inquiry method, we document substantial discrimination in the UK rental sector against applicants with a foreign accent. We find that non-UK callers were 8.6 percentage points less likely to be offered a viewing for a one-bed room property in London, compared to their UK counterparts, a 13 percent smaller success rate compared to the mean. This effect is robust to the inclusion of controls and a number of robustness checks. While we find an independent effect of indicators of lower rent (rents lower than the 25th percentile and or lower than the median), we find that the interaction between non-UK and these indicators is small and insignificant, suggesting that discrimination is present across the distribution of the value of rents. Making use of census tract information from the *Office of National Statistics*, which we link to the precise location of the properties inquired for, we document important heterogeneous effects by the composition of the neighborhood. We find much more pronounced effects in neighborhoods with a lower fraction of foreign-born residents, indicating that localized features of the rental market, are important when explaining discriminatory behavior of agents. In this case, this is consistent with rental agencies being more used to dealing with non-UK applicants in areas with higher fraction of non-UK residents. The effects are also more pronounced for inquiries made for properties located in areas with a higher share of highly educated residents, and in areas with a higher fraction of higher skilled workers.

Finally, we use information on the ethnic composition of rental agency staff, which we collected for all rental agencies involved in the experiment, including on agency staff and agency director, and find no evidence that their background matters, when controlling for the background of agency staff and directors. This suggests that discrimination observed is unlikely taste-based, but rather caused by other motivations of rental agencies, possibly related to the complexities of right-to-rent checks imposed on landlords and their agents.

The rest of the paper is organized as follows. In section 2, we provide information on the experimental design. In section, 3 we explain the different datasets collected for the analysis. In section 4, we introduce the empirical strategy and we present the results of the analysis in section 5. Section 6 concludes with some final remarks.

2 Experimental Design

The experimental design chosen in this paper to test for discrimination in the UK rental market, is similar to the audit-style approach in Yinger (1986), Bertrand and Mullainathan (2004), and

Hanson and Hawley (2011), but with marked differences in the implementation. Different from previous studies – conducting the audit by email correspondence or electronic correspondence using contact forms of rental internet platforms – we chose to make inquiries by telephone where any migration status of the potential tenants was signaled via their real accents and names. Different from previous studies which focus on simple response to email inquiries, we focus on booked viewings for the property inquired for, a more tangible and suitable measure for discrimination in rental markets.⁴ To do so, we contrasted native English speakers (with British English accents) with callers with non-British accents in a setting much closer to the real interaction between potential tenants and agency staff. We employed PhD students from varying national backgrounds to keep the group as homogeneous as possible and not signal varying degrees of social background. All our callers spoke English fluently, but with different accents (British English, Italian, Polish, Indian, Nigerian, Arabic and Chinese).⁵ We validated the different accents using voice samples through an Ethnicity Identification Survey (EIS), in which we played voice samples of the callers to crowd-workers using the Qualtrics platform as an on-demand task asking survey participants to identify the origin of callers, as UK- versus foreign-born, overwhelmingly identifying UK- and foreign-born callers correctly.⁶

We used an automated procedure to create a daily pool of one-bedroom properties in London from a leading online property portal. From this pool of standardized properties, we randomly allocated properties to the pool of callers on a daily basis, where we randomized their calling shifts during the day as much as possible.⁷

Over the period from February 2 to June 15 2017, 10,977 one bedroom properties were advertised in London entering the subject pool. From this pool, we randomly chose 1,065 properties and making 1,472 call attempts. Of these 1,472 call attempts, 1,354 calls were answered by agency staff and entered the experiment pool. In Table B.5, we report the mean numbers of attempts required to talk to estate agents about a property advert by immigration status. The number of attempts per successful call answered to UK and non-UK callers is balanced as expected, with only a minimal difference. On average, it took callers just over one attempt, and the difference is small

⁴As the callers firmly booked viewings with estate agents, to minimize the impact this had on estate agents, we canceled those bookings within at most 24h or before the time of the viewing, whichever was smaller, as set out in the ethics application at the Internal Review Board of the University of Leicester. Details of the application can be found in Appendix H.

⁵The choice of different nationalities was based on a combination of availability of PhD students from a variety of countries and the representation of the largest immigrant populations in the UK.

⁶Details on the design of the survey and the results from the exercise can be found in online Appendix F.

⁷In addition, for a subsample of properties, we matched a property to a UK and non-UK caller and randomized the order of the first call enabling us to study the effect for the same property and agent in a matched sample.

and not statistically significant. We take this as evidence that there were no differences across callers regarding their effort or the time of the calls that may have affected the response rates.

We created suitable profiles matching the background of the callers and all callers received detailed instruction with a script and training to ensure consistent standardized calls to the estate agents. Each caller made at least 10 supervised test calls to ensure that the call protocol was followed.⁸

3 Data

The data used in the analysis comes from five sources.

Property information comes from adverts on the online property portal, which we routinely collected for the entire pool of one-bed room properties in London meeting our criteria. In Table B.1 in the appendix we present mean rent for the population of one bedroom properties in different London locations and for the random sample used in the experiment. Mean rents vary substantially across different sub-regions in London⁹ with highest rents in Central London and cheapest rents in South London. In Table B.2 we present additional characteristics of the properties including information on whether the property is furnished/ unfurnished and offered for long/ short-term contracts. In both tables we provide the normalized difference confirming that property characteristics are balanced across population and experiment sample, as expected with a random sample. In Table B.3, we provide a balancing test using these characteristics by treatment status, i.e. UK or non-UK caller, also demonstrating that the random allocation by the algorithm worked. Property characteristics are well-balanced across UK/non-UK treatment, as well as along individual national backgrounds.

The second set of information on neighborhood characteristics comes from the UK population census provided by the *Office of National Statistics* (ONS). We extract information on the resident population at the postcode level linking this information to the properties.¹⁰ We are particularly interested to learn about the socio-economic composition of the postcode districts and collect information on the fractions of rental properties, UK born, UK citizen, and information on occupations

⁸Details on the experimental design, the pilot, the caller script, and the analysis from the validation of accents, can be found in Appendix E.

⁹These are regions as used by the property portal, roughly dividing London in 9 areas.

¹⁰We use the outward code of UK postcodes, which includes the area and district, because we have information on property location at this level, rather than the full postcode, and to ensure we map the information from the population census into corresponding neighborhood characteristics. In London there are 107 postcode districts, which we then link to the corresponding census districts.

and educational attainment. These neighborhood characteristics are summarized in Table B.4.

The third set of information, outcomes for our analysis, booked viewing for the properties advertised, were recorded using a standardized questionnaire during the calls. Our callers were instructed to book a viewing of the property at the earliest available time and record the response by estate agents. We distinguish between *all viewings* booked and *unconditional viewings* that did not require confirmation by the landlord. Overall, 67.9% of all inquiries lead to a booked viewing.¹¹

As a fourth set, we also collected information on the composition of estate agents by extracting information available from estate agent websites, and their local branches. We collected first and last names of all agency staff and information on their role. In particular, we were interested in the background of the director or other leading senior role in each agency and other staff members. We then matched the extracted names with a list of English first and last names and coded matches as *English* and names we couldn't match as *non-English*. Overall, we were able to collect this information on 774 out of 1,354 properties in the sample.

The final set of data we collected from a tailored survey to validate the language background of our callers. For this purpose, we extracted voice samples of 12-14 second duration from recorded calls for all of our callers. We surveyed 209 British nationals between the age of 22 to 45 recruited through the Survey platform *Qualtrics*, where we asked survey participants to judge the language background of our callers. The vast majority of survey participants confirmed the UK/non-UK background of our callers using the voice samples. Details can be found in Appendix E.

4 Estimation

We estimate the effect of non-UK status on confirmed viewings for one-bedroom properties in London using linear probability model, where we consider two dummy variables that take the value 1 if a booking is arranged and 0 otherwise. The first outcome variable considers all bookings arranged during the phone inquiry; the second outcome variable considers only unconditional viewings, that is, viewings that were fully confirmed and did not require any further communication, for instance a final confirmation after consulting the property owner. The main dependent variable, randomly assigned through our automated procedure, takes the value 1 if the caller has non-UK status, signaled by a *foreign* accent, and a value of 0 for a UK-status, signaled by a *British-English* accent.

¹¹All booked viewings were canceled before the viewing by our callers to minimize disruption of the work of the involved estate agents in line with conditions set in ethics protocol as agreed with the Research Ethics Committee at the University of Leicester.

$$y_{ij} = \beta_0 + \beta_1 Immi_{ij} + \beta_2 X_{ij} + \beta_3 Z_{ij} + d_c + \epsilon_{ij} \quad (1)$$

where y_{ij} is the outcome variable (all viewings booked or confirmed viewing only) by candidate i for property j . $Immi_{ij}$ is the indicator variable for immigration status of the candidate, X_{ij} is a vector of call characteristics, Z_{ij} is a vector of property characteristics, d_c denotes a caller fixed effect and ϵ_{ij} is the error term. We estimate equation (1) by OLS as linear probability model for ease of interpretation and computational tractability. Alternatively, we have included the estimates of the Probit regressions in the appendix Table B.6. To investigate whether discrimination against non-UK applicants depends on the amount of rent, we interact immigration status with dummies indicating rents below bottom quartile, below median and above top quartile and estimate:

$$y_{ij} = \beta_0 + \beta_1 Immi_{ij} + \beta_2 X_{ij} + \beta_3 Z_{ij} + \beta_4 R_{ij} + \beta_5 [Immi_{ij} \times R_{ij}] + d_c + \epsilon_{ij} \quad (2)$$

Where R_{ij} are dummy variables for rent which take the value of 1 if the property rent per calendar month is lower or equal to bottom quartile, lower or equal to the median or above the top quartile rent of the sample properties and 0 otherwise and $Immi_{ij} \times R_{ij}$ captures the interaction of rent and immigration status. This allows us to investigate the potential role of very localized market conditions, for example indicating market tightness in the treatment of non-UK applicants to one-bed room properties for any discriminatory behaviour of rental agents.

5 Results

5.1 Main results

We start by looking at the main results, both for all viewings and confirmed (unconditional) viewings only. Table 1 reports the results from equation (1). We find strong evidence for substantial discrimination in the UK rental market, focusing on one-bedroom properties in London. Non-UK callers, signaling a possible immigration status with their original accent, are 8.6 percentage points less likely to book a viewing for the inquired property, compared to callers with a British-English accent. Given a mean rate of booking success of 0.679, this constitutes a 12.7 percent reduction in successful viewings booked. When focusing on confirmed, unconditional viewings (column (2)), we find a very similar effect size of a 9 percentage points reduction in successful bookings. The minimal difference is unsurprising given the small number of conditional bookings of 4.8 percent,

the small difference though may indicate a further qualitative difference of the bookings, with the stronger reduction (a 14.3 percent reduction compared to the mean). The difference between the two coefficients is nevertheless not statistically significant.

We repeat the exercise and add additional controls on the neighbourhood from UK census data. We include information on the fraction of rental properties, the fraction of UK born and UK passport holders, and the fraction of highly educated and higher skilled (white collar/salariat) workers¹² in the census district. The inclusion of this set of controls does not change the estimates in any meaningful way and does not increase precision of the estimates; the inclusion of neighborhood controls slightly increases the R^2 . Alternatively, we estimate the effect of non-UK callers on viewings using Probit regressions. We report the results in appendix Table B6, including marginal effects. The results are very similar to the OLS estimates across outcomes and specifications. For a subsample of properties, we matched properties to a UK and non-UK caller and randomized the order of the first call enabling us to study the effect for the same property and agent in a matched sample. We present the estimates for this exercise in Table C.1 in the appendix. We find more pronounced effects compared to our baseline estimates, possibly due to the fact that for half of those properties, given the random order of callers, non-UK callers will have been preceded by UK callers, possibly leading to more pronounced discriminatory effects in this sample. The estimated effects for discrimination in our paper are similar to the findings elsewhere in the literature, although the different designs and outcomes make a comparison difficult. For example, using email as means of correspondence, in [Ewens et al. \(2014\)](#) applicants with African American-sounding names have a 9.3 percentage point lower positive response than applicants with white-sounding names. [Carlsson and Eriksson \(2015\)](#) find that ethnic minorities have a 11–37 percent lower chance of being invited to a room viewing compared to the ethnic majority. In an audit study, [Zhao et al. \(2006\)](#) provide estimates of discrimination against black applicants, ranging from 5.8 to 11.9 percent, providing similar effect sizes to the ones we find in our experiment.

5.2 Heterogeneous effects

To start with, we are interested in understanding whether results differ by advertised rental values. To ensure a homogeneous pool of properties, we selected one-bed room properties in London for the experiment, limiting the variation of most features of the properties. Still, there is substantial

¹²The individuals working under Class 1 and Class 2 Occupational category. See Appendix D for different occupational classes

variation in rents across one-bed room properties in London. This is confirmed in appendix Table B.1. reporting substantial variation in mean rental values within and across different London locations.¹³ We test whether the effects of immigrant status varies by rental values of properties and do so by interacting our treatment dummy with rental values continuously and separately with a number of dummies indicating rents below the median rental value, and dummies indicating rents below the bottom and above the top quartiles of rents to explore effects along the distribution. We report the results in Table 2. The effect of non-UK status is slightly more pronounced, but the difference is not statistically significant. In column (1) we present the results for the interaction of the non-UK dummy with rent. We find a positive, but insignificant effect of on the interaction term of non-UK status with rent, more than compensating, at the average rent value, for the increase in the non-UK dummy. In columns (2) to (4), we interact the non-UK dummy with indicator variables for rental values below the bottom quartile, below the median and above the third quartile, respectively. Again, we find a positive, insignificant effect for the interaction term. For low rents, we find a similar effect size to the main estimates and with an increasing rental value, taken together, the effect of non-UK status is reduced more and more, and for column (4) almost entirely disappears. We now find that a low rental value independently reduces the chances for a booking of a viewing and this effect disappears when moving to rents in the bottom three quartiles.

To investigate possible heterogeneous effects beyond rental value further, we collected information from the UK population census provided by the ONS at the area and district level of the UK postcode on a number of neighbourhood characteristics possibly relevant for studying discrimination.¹⁴ Similar to looking at the rental value, to start this exercise we collected information at the fraction of rental properties (versus owner occupied and commercial). We then collected census information on the fraction of UK born and UK passport holders to inform about the composition of the neighborhood of the advertised properties with respect to immigration, allowing us to investigate whether the effects on discrimination vary by these margins. Finally, we also look at the general socio-economic composition and collected information on education and occupation. For each of these variables, we split the sample by the median value and estimate the effect separately for *low* and *high* values. For education, we consider *low education* for any educational attainment below degree level (below level 4 qualifications); for occupation, we split the sample largely into *lower skilled* versus *higher skilled* occupations.¹⁵

¹³We also display the distribution of rental values in Figure A.1 in the appendix.

¹⁴In Table B4 in the appendix, we report summary statistics on these neighbourhood characteristics.

¹⁵This categorization is skills based, for example, high skilled occupations include professional, administrative,

Starting with the fraction of rental properties, we find only a minimal difference between low and high rental property areas, in line with the findings on rental values. Next, we investigate the effects by differences in the immigration background (columns (3) and (4)) and document striking differences in the estimated coefficients. In areas with a low fraction of UK-born population, i.e. a larger fraction of inhabitants with a immigration background, we find a very small, insignificant effect. In contrast, in areas above the median fraction of UK-born inhabitants, we find a much more pronounced effects, roughly a 26% reduction in viewings for callers with a non-UK accent. This indicates that the discrimination results we document, are exclusively driven by properties in areas with a low fraction of individuals with an immigration background. This is, for example, consistent with landlords and rental agents being less prepared to dealing with non-UK applicants, having less experience for instance in checking the right-to-rent documentation and checking the right-to-rent status with the Home Office, in case applicants currently do not have their passports available. This might be the case if rental agencies acquire experience in effectively dealing with applicants that are of non-UK origin, for example by developing an understanding of the different visas admissible for right-to-rent checks. The difference in estimated effects, nevertheless, may also be consistent with systematic differences in preferences for UK applicants by landlords and rental agents that differ across postcodes depending on the local composition of residents. In contrast, we do not find a significant difference, when splitting the sample by the fraction of residents by UK passport status. This may in part be explained by the larger fraction of UK passport holders,¹⁶ indicating that many individuals born abroad eventually acquire a UK passport, hence a UK passport may be less indicative of any immigration background. We find a similar discrepancy of the effects—as for the fraction of UK-born—across the socio-economic background variables in columns (3) and (4). The effects are much more pronounced in postcode areas with higher average educational attainment of residents (-0.160, a 23% reduction) and in areas with more high-skilled residents (-0.440). These diverging results point to important heterogeneous effects by local area characteristics. It is difficult though to draw clear conclusions of what is behind those heterogeneous effects, given that these characteristics are likely strongly positively correlated.

and managerial occupations. A description of the occupational classification used in this exercise, can be found in Appendix D.

¹⁶In Table B.4 in the appendix, this difference is apparent, with a median of 0.587 and 0.701 for UK born and UK passport holder, respectively.

5.3 Potential moderating factors

Finally, we engage in a test that allows us to explore further the role of rental agents in the process of discriminating against non-UK applicants. For this exercise, we collected information on the composition of all London estate agents. We extracted this information from the website of each agency/ branch linked to the adverts on the online property portal. We focused on two dimensions: First, we collected information on the names in the lettings team of each agency. Second, we collected information on the directors of each agency. We merged the names to lists of typically English/British names and created a dummy variable taking the value of 0 for names typical for UK background, and 1 otherwise. For staff we recorded a value of 1 (suggesting an immigration background) if there was at least one staff member with a non-UK name. We then interacted the treatment dummy with the immigration status dummy separately for agency staff and for agency director. The results are reported in Table 4. Starting with the immigration status of agency staff in column (1), we find that the coefficient for non-UK status is very similar to the original estimate without the interaction term, slightly more pronounced and less precisely estimated. The coefficient on the interaction term is negative, but small and not significant. We find a very similar pattern for the status of the agency director. The coefficient on non-UK callers is virtually identical to the original coefficient, and we find a moderate negative, but insignificant coefficient on the interaction term. Taken together, this indicates, that the composition of staff in an agency handling our calls or the managers of the agency does not systematically impact discrimination documented in our experiment. Nevertheless, given that we only managed to collect information on the background of staff and managers of the rental agencies for about half of the agencies, we cannot rule out that there the migration background of rental agents has an effect on rental discrimination against non-UK callers. The negative coefficient for both interaction terms indicates, possibly contrary to expectation, that a non-English name – suggesting a migration background – increases rather than reduces the discrimination effect, but the coefficient is not significant.

6 Final Remarks

In this paper, we propose a novel way to test for discrimination in rental markets by designing a randomized controlled trial with trained call handlers with different accents making inquiries for viewings of standardized rental properties in London. This approach is different from previous studies using mail correspondence or internet inquiries and has two main advantages. First, the

telephone inquiries are much closer to how many of the initial interactions with rental agencies happen in practice. Second, different from mail or internet inquiries, the telephone inquiry in this paper allows us to get a more tangible outcome, namely confirmations of bookings for viewings of properties. This contrasts with many previous papers using response rates to the written inquiry as main outcome measure. While we cannot investigate actual offers of a rental contract for practical and ethical reasons, booked viewings are an outcome measure closer to the offer of a rental contract compared to a simple response to an inquiry. Finally, in line with the previous literature, we find very substantial discrimination against non-UK callers inquiring for viewings of one-bed room rental properties in London. We find that callers with non-UK accents had a 12.7 percent lower success rate of viewings booked, compared to the mean.

We also document substantial heterogeneous effects along a number of neighbourhood characteristics. We find much more pronounced effects in areas with a higher fraction of UK born population. In contrast, we find no evidence for discrimination in areas with a low fraction of UK born population in London. This is a striking finding, given that all inquiries made were within London and given our finding that the composition of rental agency staff does not affect the discrimination result. This result is consistent with rental agencies being more used and hence possibly better trained to deal with non-UK applicants in areas with higher fraction of non-UK born individuals, for example reducing the cost and uncertainty of dealing with right-to-rent checks. We cannot rule out though, that the effects reflect taste-based discrimination of landlords. In the absence of information on the immigration background of landlords ultimately owning the properties, this is not something we investigate. While we cannot directly test whether right-to-rent checks contribute to discrimination, descriptive research has outlined how right-to-rent checks pose a burden for the daily operation of rental agencies, with the administrative burden detailed in [Mc-kee et al. \(2021\)](#). Our results indicate substantial discrimination for citizens with non-UK accents reducing their chances to rent in their preferred location. This also indicates that discrimination in rental markets may contribute to segregation in neighbourhoods by migration status, providing an alternative explanation to segregating preferences ([Bayer and McMillan \(2006\)](#)).

References

- Ahmed, Ali M and Mats Hammarstedt**, “Discrimination in the rental housing market: A field experiment on the Internet,” *Journal of Urban Economics*, 2008, *64* (2), 362–372.
- **and –**, “Detecting discrimination against homosexuals: Evidence from a field experiment on the Internet,” *Economica*, 2009, *76* (303), 588–597.
- , **Lina Andersson, and Mats Hammarstedt**, “Are lesbians discriminated against in the rental housing market? Evidence from a correspondence testing experiment,” *Journal of Housing Economics*, 2008, *17* (3), 234–238.
- , – , **and –**, “Can discrimination in the housing market be reduced by increasing the information about the applicants?,” *Land Economics*, 2010, *86* (1), 79–90.
- Baldini, Massimo and Marta Federici**, “Ethnic discrimination in the Italian rental housing market,” *Journal of Housing Economics*, 2011, *20* (1), 1–14.
- Bayer, Patrick and Robert McMillan**, “Racial sorting and neighborhood quality,” *NBER Working Paper Series*, 2006, *11813*.
- Bosch, Mariano, M Angeles Carnero, and Lidia Farre**, “Information and discrimination in the rental housing market: Evidence from a field experiment,” *Regional Science and Urban Economics*, 2010, *40* (1), 11–19.
- Carlsson, Magnus and Stefan Eriksson**, “Ethnic Discrimination in the London Market for Shared Housing,” *Journal of Ethnic and Migration Studies*, 2015, *41* (8), 1276–1301.
- Carpusor, Adrian G and William E Loges**, “Rental discrimination and ethnicity in names,” *Journal of Applied Social Psychology*, 2006, *36* (4), 934–952.
- Choi, Seok Joon, Jan Ondrich, and John Yinger**, “Do rental agents discriminate against minority customers? Evidence from the 2000 Housing Discrimination Study,” *Journal of Housing Economics*, 2005, *14* (1), 1–26.
- Crawford, Joe, Kim McKee, and Sharon Leahy**, “More Than a Hostile Environment: Exploring the Impact of the Right to Rent Part of the Immigration Act 2016,” *Sociological Research Online*, 2020, *25* (2), 236–253.
- Ewens, Michael, Bryan Tomlin, and Liang Choon Wang**, “Statistical Discrimination or Prejudice? A Large Sample Field Experiment,” *The Review of Economics and Statistics*, 2014, *96* (1), 119–134.
- Gusciute, Egle, Peter Mühlau, and Richard Layte**, “Discrimination in the rental housing market: a field experiment in Ireland,” *Journal of Ethnic and Migration Studies*, 2022, *48* (3), 613–634.
- Hanson, Andrew and Michael Santas**, “Field Experiment Tests for Discrimination against Hispanics in the US Rental Housing Market,” *Southern Economic Journal*, 2014, *81* (1), 135–167.
- Heckman, James J**, “Detecting discrimination,” *The Journal of Economic Perspectives*, 1998, pp. 101–116.

- **and Peter Siegelman**, *Clear and Convincing Evidence: Measurement of Discrimination in America*, Urban Institute Press, 1993.
- Hellyer, Joshua**, “Homophobia and the home search: Rental market discrimination against same-sex couples in rural and urban housing markets,” *Journal of Housing Economics*, 2021, *51*, 101744.
- Massey, Douglas S and Garvey Lundy**, “Use of Black English and racial discrimination in urban housing markets: New methods and findings,” *Urban affairs review*, 2001, *36* (4), 452–469.
- Mckee, Kim, Sharon Leahy, Trudi Tokarczyk, and Joe Crawford**, “Redrawing the border through the ‘Right to Rent’: Exclusion, discrimination and hostility in the English housing market,” *Critical Social Policy*, 2021, *41* (1), 91–110.
- Ondrich, Jan, Alex Stricker, and John Yinger**, “Do landlords discriminate? The incidence and causes of racial discrimination in rental housing markets,” *Journal of Housing Economics*, 1999, *8* (3), 185–204.
- , **Stephen L Ross, and John Yinger**, “How common is housing discrimination? Improving on traditional measures,” *Journal of Urban Economics*, 2000, *47* (3), 470–500.
- Page, Marianne**, “Racial and ethnic discrimination in urban housing markets: Evidence from a recent audit study,” *Journal of Urban Economics*, 1995, *38* (2), 183–206.
- Quillian, Lincoln, John Lee, and Mariana Oliver**, “Evidence from field experiments in hiring shows substantial additional racial discrimination after the callback,” *Social Forces*, 2020, *99* (2), 732–759.
- Roychoudhury, Canopy and Allen C Goodman**, “Evidence of Racial Discrimination in Different Dimensions of Owner-Occupied Housing Search,” *Real Estate Economics*, 1996, *24* (2), 161–178.
- Thorat, Sukhadeo, Anuradha Banerjee, Vinod K Mishra, and Firdaus Rizvi**, “Urban Rental Housing Market,” *Economic and Political Weekly*, June 2015.
- Yinger, John**, “Measuring racial discrimination with fair housing audits: Caught in the act,” *The American Economic Review*, 1986, pp. 881–893.
- Zhao, Bo, Jan Ondrich, and John Yinger**, “Why do real estate brokers continue to discriminate? Evidence from the 2000 Housing Discrimination Study,” *Journal of Urban Economics*, 2006, *59* (3), 394–419.

Tables

Table 1: Effect of immigration status on viewings booked and confirmed bookings

	Viewings	Confirmed viewings	Viewings	Confirmed viewings
	(1)	(2)	(3)	(4)
Non-UK	-0.086*** (0.029)	-0.090*** (0.028)	-0.090*** (0.027)	-0.092*** (0.028)
Call and property controls	Yes	Yes	Yes	Yes
All controls	No	No	Yes	Yes
Sample	1,354	1,354	1,354	1,354
Mean	0.679	0.631	0.679	0.631
R ²	0.036	0.050	0.037	0.052

Note: The table reports estimated effects of applicant's immigration status on the viewings (column(1)) and on confirmed viewings (column(2)) with call and property controls and viewings (column(3)) and confirmed viewings (column(4)) with all controls which includes call controls, property controls and neighbourhood characteristic controls. Viewings include all prospective viewings booked including both the viewings booked with and without confirmation required from the landlord by the callers. Confirmed viewings only include those viewings which are confirmed by the estate agent or landlord. Call controls include period of call, day of the week, duplicate call dummies and day elapsed dummies. The property controls include rent per calendar month, dummies for type of furnishing, letting duration and location (boroughs in London). The neighbourhood characteristic controls include the proportion of rented households, proportion of inhabitants born in the UK born, proportion of inhabitants holding UK passport, proportion of inhabitants with level 4 education and the proportion of inhabitants with salaried occupation (Class 1 and 2). See Appendix (D) for different occupational classes. All specification include caller fixed effects. Robust standard errors in parentheses are clustered at caller level for all specification.*** p<0.01, ** p<0.05, * p<0.1.

Table 2: Interaction with rent variable

Viewings	(1)	(2)	(3)	(4)
Non-UK	-0.162*** (0.055)	-0.091*** (0.027)	-0.109*** (0.026)	-0.120*** (0.035)
rent	0.070 (0.041)			
Non-UK \times rent	0.046 (0.036)			
smaller than 25th percentile		-0.097*** (0.030)		
Non-UK \times smaller than 25th percentile		0.021 (0.052)		
smaller than 50th percentile			-0.065** (0.025)	
Non-UK \times smaller than 50th percentile			0.053 (0.040)	
higher than 75th percentile				-0.033 (0.092)
Non-UK \times higher than 75th percentile				0.098 (0.078)
Call and property controls	Yes	Yes	Yes	Yes
Sample	1,354	1,354	1,354	1,354
Mean	0.679	0.679	0.679	0.679
R ²	0.036	0.040	0.037	0.038

Note: The table reports estimated effects of applicant's immigration status interacted with the rent per calendar month, smaller than 25th percentile, smaller than 50th percentile and higher than 75th percentile rent of the properties on the viewings booked in columns (1), (2), (3) and (4) respectively with call and property controls. All specification include caller fixed effects and caller characteristic controls (period of call, day of the week, duplicate call dummies and day elapsed dummies) and property controls include rent per calendar month, dummies for type of furnishing, letting duration and location (boroughs in London). Robust standard errors in parantheses are clustered at caller level for all specification.*** p<0.01, ** p<0.05, * p<0.1.

Table 3: Effect of immigration status on viewing booked by neighbourhood characteristics

	Rental properties		UK born		UK passport		Education		Occupation	
	low	high	low	high	low	high	low	high	low	high
Non-UK	-0.081* (0.040)	-0.091* (0.044)	0.019 (0.044)	-0.184*** (0.035)	-0.042 (0.042)	-0.034 (0.038)	-0.050 (0.043)	-0.160*** (0.036)	-0.029 (0.035)	-0.168*** (0.039)
Call and property controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Sample	678	676	651	703	702	652	662	692	658	696
Mean	0.662	0.697	0.659	0.698	0.684	0.675	0.659	0.699	0.664	0.694
R ²	0.077	0.067	0.066	0.070	0.071	0.096	0.065	0.070	0.069	0.061

Note: The table reports estimated effects of applicant's immigration status on the viewings booked for the properties belonging to neighbourhoods with different proportions of inhabitants occupied in rented households (columns (1) and (2)), proportion of inhabitants who are UK born (columns (3) and (4)), proportion of inhabitants holding UK passport (columns (5) and (6)), proportion of inhabitants with Level 4 education (columns (7) and (8)), proportion of inhabitants with Salarial occupation (Class 1 and 2) given as Occupation (columns (9) and (10)). See Appendix (D) for different occupational classes. The first column of each category shows the proportion less than median and the second column of each category shows the proportion higher than or equal to median respectively, with call and property controls. Call controls include the caller identification, period of call, day of the week, duplicate call dummies and day elapsed dummies. The property controls include rent per calendar month, dummies for type of furnishing, letting duration and location (boroughs in London). All specification include caller fixed effects. Robust standard errors in parentheses are clustered at caller level for all specification. *** p<0.01, ** p<0.05, * p<0.1.

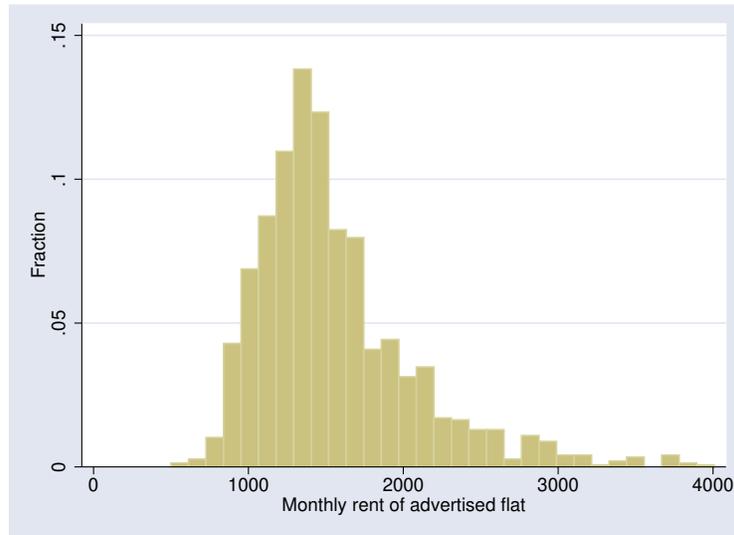
Table 4: Effect of ethnicity on viewings booked immigrant status of the agency staff

Viewings	(1)	(2)
Non-UK	-0.095* (0.045)	-0.084* (0.048)
Non-English (Staff)	0.018 (0.037)	
Non-UK \times Non-English (Staff)	-0.024 (0.050)	
Non-English (Director)		0.052 (0.047)
Non-UK \times Non-English (Director)		-0.051 (0.068)
Call and property controls	Yes	Yes
Sample	1,354	1,354
Mean	0.679	0.679
R ²	0.036	0.037

Note: The table reports estimated effects of applicant's ethnicity on the viewings booked interacted with the presence of at least one immigrant as the estate agency's staff (column (1)) and interacted with the presence of at least one immigrant as the estate agency's director (column (2)) with call and Property controls. The agency staff includes the agency director. The interaction with the term used for indicating no information available on the agency staff or the ones we couldn't merged due to lack of available data are excluded from the table. All specification include caller fixed effects and caller characteristic controls (period of call, day of the week, duplicate call dummies and day elapsed dummies) and property controls include rent per calendar month, dummies for type of furnishing, letting duration and location (boroughs in London). Robust standard errors in parentheses are clustered at caller level for all specification.*** p<0.01, ** p<0.05, * p<0.1.

A Appendix Figures

Figure A.1: Rent per calendar month



Note: The figure depicts the distribution of rent per calendar month for the sample properties. The x-axis shows the monthly rent for the advertised properties and the y-axis shows the fraction. The rent per calendar month is truncated at £4,010.

B Appendix Tables

Table B.1: Summary statistics of rental values for population and sample by location

Location	Population			Sample			Diff.	ND
	Obs.	Mean Rent	SD	Obs.	Mean Rent	SD		
Central London	1,587	2,375.82	908.85	140	2,333.94	884.66	41.88	0.033
East London	1,675	1,470.37	387.51	164	1,409.03	325.68	61.34	0.121
North East London	1,071	1,348.41	407.21	100	1,326.79	395.78	21.62	0.038
North London	1,362	1,584.15	3,508.77	160	1,490.51	410.16	93.64	0.027
North West London	747	1,403.20	355.96	76	1,421.95	337.17	-18.74	-0.038
South East London	1,485	1,434.27	456.38	145	1,369.17	367.76	65.10	0.111
South London	769	1,332.77	556.13	70	1,202.60	345.98	130.17	0.199
South West London	737	1,454.82	355.15	62	1,499.61	348.30	-44.80	-0.090
West London	1,544	1,840.58	678.89	148	1,785.15	619.69	55.43	0.060
All	10,977	1,635.28	1,390.18	1065	1,574.60	601.86	60.68	0.040

Note: The population consists of total number of property advertisements posted during the experiment along with the mean rent and standard deviation of rent for each location in London. The sample advertisements are the advertisements to which Telephone Inquiry has been made. The properties for which more than one calls were made has been omitted. The total number of observations (columns (1) and (4)), mean rent (columns (2) and (5)), standard deviation of rent (columns (3) and (6)) along with the mean difference (Diff.) in rent (column (7)) and normalised difference (Norm.Diff.) (column (8)) are given in the table.

Table B.2: Summary statistics of property characteristics for population and sample by location

Location	Population			Sample			Diff.	ND
	Obs.	Mean	SD	Obs.	Mean	SD		
Unfurnished	1,440	0.17	0.38	146	0.17	0.38	0.00	0.008
Furnished	6,854	0.83	0.38	716	0.83	0.38	0.00	-0.008
Long Term	5,254	0.94	0.24	495	0.95	0.21	-0.01	-0.041
Short Term	342	0.06	0.24	25	0.05	0.21	0.01	0.041

Note: The population consists of total number of property advertisements posted during the experiment for London area. The sample advertisements are the advertisements to which Telephone Inquiry has been made. The properties for which more than one calls were made has been omitted. The property characteristics included here are furnishing-furnished/unfurnished, letting type-long term/short term and rent per calendar month. The total number of observations (columns (1) and (4)), mean (columns (2) and (5)) and standard deviation (columns (3) and (6)) of property characteristics for population and sample advertisements along with the mean difference (Diff.) (column (7)) of the property characteristics and normalised difference (ND) (column (8)) of the property characteristics and normalised are shown in the table.

Table B.3: Summary statistics of sample property characteristics used for the experiment

Immigration Status/ <i>Immigration Status</i>	Unfurnished			Furnished			Long Term			Short Term			Rent		
	Mean	SD	ND	Mean	SD	ND	Mean	SD	ND	Mean	SD	ND	Mean	SD	ND
UK	0.18	0.39		0.82	0.39		0.95	0.22		0.05	0.22		1,595.62	600.48	
Non-UK	0.16	0.37	0.036	0.84	0.37	-0.036	0.96	0.21	-0.028	0.04	0.21	0.028	1,559.69	602.88	0.042
<i>Ethnicity</i>															
British	0.17	0.37		0.83	0.37		0.94	0.24		0.06	0.24		1,588.93	603.55	
Arabic	0.19	0.39	-0.041	0.81	0.39	0.041	0.98	0.14	-0.151	0.02	0.14	0.151	1,583.58	830.73	0.005
Chinese	0.19	0.40	-0.045	0.81	0.40	0.045	0.97	0.17	-0.114	0.03	0.17	0.114	1,625.52	562.79	-0.044
Indian	0.21	0.41	-0.082	0.79	0.41	0.082	0.95	0.23	-0.021	0.05	0.23	0.021	1,453.29	460.17	0.179
Italian	0.14	0.35	0.053	0.86	0.35	-0.053	0.95	0.21	-0.042	0.05	0.21	0.042	1,578.84	533.47	0.013
Nigerian	0.12	0.33	0.102	0.88	0.33	-0.102	0.94	0.24	-0.017	0.06	0.24	0.017	1,510.60	434.34	0.105
Polish	0.16	0.37	0.017	0.84	0.37	-0.017	0.96	0.19	-0.085	0.04	0.19	0.085	1,572.53	529.39	0.020

Note: The sample advertisements are the advertisements to which telephone inquiry has been made. The properties for which more than one calls were made has been omitted. The property characteristics included here are furnishing-furnished/unfurnished, letting type-long term/short term and rent per calendar month. The mean (columns (1), (4), (7), (10) and (13)), standard deviation (columns (2), (5), (8), (11) and (14)) of all the properties along with the normalised difference (ND) for the mean (columns (3), (6), (9), (12) and (15)) are shown in the table.

Table B.4: Summary Statistics of Neighbourhood characteristics

	Mean	Median	SD	Min	Max
Rental Property Prop.	0.286	0.288	0.011	0.059	0.515
UK Born Prop.	0.583	0.587	0.010	0.363	0.936
UK Passport Prop.	0.687	0.701	0.007	0.500	0.892
Occupation Prop.	0.400	0.377	0.016	0.148	0.667
Education Prop.	0.434	0.413	0.015	0.173	0.692

Note: Table reports the summary statistics of the neighbourhood characteristics (given in proportions) of the sample properties. Columns (1) to (5) shows the mean, median, standard deviation, the maximum and minimum values respectively.

Table B.5: T-test: Difference in mean between number of call attempts made to estate agents by immigration status

	UK		Non-UK		Diff.	Std. Error	t-value	ND
	Mean	SD	Mean	SD				
All Calls								
No.of call attempts made	1.033	0.252	1.029	0.206	0.004	0.012	0.352	0.012
Observations	635		835		1,470			
Conditional on calls attended								
No.of call attempts made	1.020	0.142	1.025	0.156	-0.004	0.008	-0.550	-0.024
Observations	588		764		1,352			

Note: Table shows the two sample t-test with unequal variance between the no.of call attempts by immigration status made with the estate agency. It also shows the two sample t-test with unequal variance between the no.of call attempts by immigration status conditional on the call being attended by the estate agent. The first two columns show the mean and standard deviation (SD) of call attempts made by the UK callers respectively. The second and third columns show the mean and standard deviation of call attempts made by Non UK callers respectively. The fifth column (Diff.) shows the mean difference between the UK and Non UK call attempts. The sixth and seventh columns represent the standard error and t-values respectively. The final column shows the normalised mean difference between the UK and Non-UK calls.

Table B.6: Probit Regression: Effect of immigration status on viewings booked and confirmed bookings

	Viewings		Confirmed viewings		Viewings		Confirmed viewings	
	Coef.	dy/dx	Coef.	dy/dx	Coef.	dy/dx	Coef.	dy/dx
Non-UK	-0.246*** (0.085)	-0.084*** (0.028)	-0.259*** (0.078)	-0.092*** (0.027)	-0.262*** (0.082)	-0.089*** (0.027)	-0.269*** (0.079)	-0.096*** (0.027)
Call and property controls	Yes		Yes		Yes		Yes	
All controls	No		No		Yes		Yes	
Sample	1,353	1,353	1,353	1,353	1,353	1,353	1,353	1,353
Mean	0.679		0.630		0.679		0.630	
Pseudo R ²	0.029		0.038		0.030		0.040	

Note: Table reports probit estimates for the effects of applicant's immigration status on the viewings (columns (1) and (2)) and on confirmed viewings (columns (3) and (4)) with call and property controls and viewings (columns(5) and (6)) and confirmed viewings (columns(7) and (8)) with all controls which includes call controls, property controls and neighbourhood characteristic controls. The columns on Coef. indicates the probit coefficient and dy/dx columns show the marginal effect of the probit model. Viewings include all prospective viewings booked including both the viewings booked with and without confirmation required from the landlord by the callers. Confirmed viewings only include those viewings which are confirmed by the estate agent or landlord. Call controls include period of call, day of the week, duplicate call dummies and day elapsed dummies. The property controls include rent per calendar month, dummies for type of furnishing, letting duration and location (boroughs in London). The neighbourhood characteristic controls include the proportion of rented households, proportion of inhabitants born in the UK born, proportion of inhabitants holding UK passport, proportion of inhabitants with level 4 education and the proportion of inhabitants with salariat occupation (Class 1 and 2).See Appendix (D) for different occupational classes. All specification include caller fixed effects. Robust standard errors in parenthesis are clustered at caller level for all specification. *** p<0.01, ** p<0.05, * p<0.1.

Table B.7: Type of Estate Agency

Agency Type	Obs.	Percent
Branch	726	49.32
Headquarters	26	1.77
Independent	425	28.87
Not available	5	0.34
Cannot merge	290	19.70
Total	1,472	100.00

Note: Table shows the estate agency staff information available online for the sample of properties used for the study. The table rows report the different range of agency information available online on the type of estate agency. The information on the type of estate agency include whether the estate agency is a branch, headquarters, whether a small independent estate agency, the information not available online and finally those properties for which the data collected could not be merged due to unavailability of relevant data. Column (1) shows the number of agencies and column (2) shows the percentages.

Table B.8: Estate agency staff information availability online

Information Availability	Obs.	Percent
Available	638	43.34
Only photo available	17	1.15
Not available	217	14.74
Others	310	21.06
Cannot merge	290	19.70
Total	1472	100.00

Note: Table shows the estate agency staff information available online for the sample of properties used for the study. The table rows report the different range of agency information available online on the estate agency staff. The information about the staff, in our case, the name and position were either available, only photograph of the team was available, not available on the website, others include the testimonials where the names of the staff were mentioned and finally those properties for which the data collected couldn't be merged due to unavailability of relevant data. Column (1) shows the number of agencies and column (2) shows the percentages.

Table B.9: Robustness check using different samples

	Sample 1	Sample 2	Sample 3	Sample 4
	(1)	(2)	(3)	(4)
Non-UK	-0.086*** (0.029)	-0.071** (0.032)	-0.089*** (0.027)	-0.076** (0.032)
Controls	Yes	Yes	Yes	Yes
Sample	1,354	1,221	1,220	1,087
Mean	0.679	0.695	0.673	0.690
R ²	0.036	0.034	0.043	0.039

Note: The table reports estimated effects of applicant's immigration status on the viewings booked for the properties including every property to which calls were made(column(1)), excluding the lowest 10 percentile (column(2)),excluding highest 10 percentile (column(3)) and both lowest and highest 10 percentiles respectively (column(4)) with call and property controls. All specification include caller fixed effects and caller characteristic controls (period of call, day of the week, duplicate call dummies and day elapsed dummies) and property controls include rent per calendar month, dummies for type of furnishing, letting duration and location (boroughs in London). Robust standard errors in parentheses are clustered at caller level for all specification.*** p<0.01, ** p<0.05, * p<0.1.

C Matched Data

Table C.1: Effect of ethnicity on viewings booked and confirmed bookings for matched calls

	Viewings (all)	Viewings (confirmed)
	(1)	(2)
Non-UK	-0.265** (0.115)	-0.223** (0.090)
Controls	Yes	Yes
Sample	706	706
Mean	0.670	0.619
R ²	0.678	0.670

Note: The table reports estimated effects of applicant's ethnicity on the viewings booked (column (1)) and on confirmed bookings (column (2)) with call and property controls. All specification include caller fixed effects, property fixed effects and caller characteristic controls (period of call, order of the call made, day of the week and day elapsed dummies). Robust standard errors in parentheses are clustered at caller level for all specification.*** p<0.01, ** p<0.05, * p<0.1.

D Occupational Classification

Class 1: Large employers, higher grade professional, administrative and managerial occupations: ‘the higher salariat’

Class 2: Lower grade professional, administrative and managerial occupations: higher grade technician and supervisory occupations: ‘the lower salariat’

Class 3: Intermediate occupations: ‘higher grade white collar workers’

Classes 4 and 5: Small employers and self-employed in non-professional occupations: ‘petit-bourgeoisie or independents’

Class 6: Lower supervisory and lower technician occupations: ‘higher grade blue collar workers’

Class 7: Lower services, sales and clerical occupations: ‘lower grade white collar workers’

Class 8: Lower technical occupations: ‘skilled workers’

Class 9: Routine occupations: ‘semi- and unskilled workers’

Class 10: Never worked and long-term unemployed: ‘unemployed’

Source: <https://www.iser.essex.ac.uk/archives/esec/user-guide/detailed-category-descriptions-and-operational-issues>

Note: For the purpose of analysis in Table 3 (columns (9) and (10)), the proportion of inhabitants with Salariat occupation was used. The Salariat occupation includes Class 1 and Class 2 of the Occupation categories given above which include professional, administrative and managerial occupations.

Appendix for Online Publication

E Detailed Experimental Design

For the purpose of conducting the experiment, we created a daily pool of advertised one-bed room properties meeting our requirements and we created a bespoke computer algorithm to automatically create the pool of daily properties (from all properties meeting the required characteristics newly advertised on the portal within the prior 24 hours) and draw a random sample from this pool. The development, testing and the implementation of the algorithm was facilitated through a software engineer position via the University of Leicester IT ReSET post.

E.1 The Pilot Study

Prior to implementing the telephone survey on the London rental housing market, we undertook a pilot study with the aims to act as training for the callers and to test and amend the survey questionnaire and telephone procedures. In order to avoid contamination of the future subject pool and the agencies involved for the actual experiment, we selected the sample rental properties from outside the London area for the pilot study. We made a total of 100 calls for the pilot study across our callers as part of their training. This was also meant to ensure consistency in calls for the actual experiment. All bookings for viewings were canceled within 24 hours of making the call to minimize cost on the part of estate agents. The callers were given a set script to follow during the telephone inquiries and they were asked to strictly follow the script throughout the inquiry. The registration form sent out by some estate agents as part of the booking process during the pilot helped us to amend the inquiry questions and script. The pilot also gave us more insight into additional questions that the estate agents asked during the calls (that were not part of the pilot questionnaire). These were later included in the script for the actual experiment.

The detailed experimental design process was organized as follows: (i) definition of properties for experiment, (ii) creating identities of fictitious applicants, (iii) automated selection of population and sample and (iv) telephone inquiries.

E.2 Selection of Property Advertisements

For the selection of the real estate advertisements, we used a leading internet platform which publishes advertisements of available rental apartments in England. The portal carried property advertisement by real estate agents as well as individual property owners along with the contact details of the landlord/estate agent. Our algorithm extracted the full advertisement details along with the contact numbers of the estate agents which appeared on the website within the last 24 hours. The extraction was done on 00:00 am everyday for

the entire duration of the experiment. This data was later used for making the calls.

E.3 Creating Identities of Fictitious Applicants

We created fictitious details that the caller would use while making the phone calls to the estate agents. One of the major factors that signals the ethnicity in the case of telephone inquiry was the identifiable accent. To make the inquiries more convincing we were required to create fictitious identities for the applicants. Identities included specific pieces of information regarding background of the callers, including names, current address, and professional details. We created ethnicity indicating names, email addresses, postal address, phone number, salary, employer name, marital status etc. We divided the identities of fictitious applicants into two regions: UK, non-UK. For the non-UK, we had callers belonging to Italy, Poland, Indian, Nigerian, Arabic and Chinese nationalities. As mentioned before, each caller was trained individually, and they ran at least 10 pilot calls before the actual survey.

The selection of nationalities under each region was mainly based on immigration statistics, from which we chose the nationalities with highest number of immigrants to the UK first followed by the second highest and so on.

The second step was the creation of fictitious names and surnames for each ethnicity. For this purpose, we selected some of the most commonly used names and surnames in each country under consideration from official country statistics. We then generated their email addresses. We created the email IDs with combination of names, surnames and numbers using a popular email provider. We also created postal addresses and phone numbers for each of the fictitious identities. For the address generation, we used randomly chosen addresses from the same borough in London. We randomly picked postcodes for this borough and using the selected postcodes, we generated addresses via a random address generator website. We used unique mobile phone numbers we procured from a popular mobile network for individual applicants.

E.4 Population and Sample

The population for the telephone survey included all London property advertisements posted on the website which met the property criteria for selection. The criteria for selection of property advertisements were the following: the properties had to be one bedroom properties, no shared accommodation, properties that entered the market for first time and were not readvertised properties (for example, after a price reduction). The sample for our telephone survey were randomly selected each day from the pool of properties that was advertised on the market over a specified period (last 24 hours). The same property could be applied for twice per day, by a UK caller and one by a non-UK caller for our matched sample. From a population of 10,977 advertised properties, we randomly selected 1,472 sample properties to make the calls.

E.5 Advertisement Inquiry

After samples were randomly selected from the pool, each caller was provided with an excel sheet with property details including telephone numbers of the estate agents to make inquiry calls. Everyday an equal number of hours were allocated for UK and non-UK callers to make the calls. Each day, a UK caller was paired with a non-UK caller randomly (subject to their availability) and they used the same property details to make the calls. As the number of calls made by each individual likely varied per hour, we used both, matched and unmatched samples in our data set. All the individually matched calls were made on the same day. This means, the majority of the estate agents under our sample received two calls for the same property during a particular day. We also made sure that order of the applications from UK and non-UK interchanged for every set of excel sheet per day through out the experiment. Telephone calls were made by both male and female trained callers representing UK (British) and non-UK (Polish, Italian, Arabic, Nigerian, Chinese and Indian) identities. Every answer except the basic identity information like name and contact details were kept identical. Out of 1,472 calls made to the 1,065 sample properties, 1,354 calls were answered by the estate agents/landlords.

E.6 Caller Instructions for the Telephone Survey

- You will need to make all the calls from the landline provided.
- First create Gmail ID with the identity provided to you.
- As soon as you enter the work, switch on the computer, and open Audacity.
- Before dialing any number from the landline, PRESS ** (double star) to make the number private and to be able to call out.
- You need to make sure you start recording via audacity before starting any phone calls.
- After each call, stop and save audacity and place the audio file in a folder which should be submitted via drop box /one drive after you finish your slot.
- Along with the audio files, you should submit the summary of the task you performed, during that session.
- You need to use the specific identity given to you to answer the agent's queries during the calls. The identity will include a name, address, email id and other details.
- After each call, you must fill out the questionnaire given to you based on the call made.
- At the end of your session submit all the documents before leaving.

E.6.1 Script to be used for the Telephone Calls

Hello,

My name is (Name will be specified in respective RA's .doc)

I'm interested in the flat on (Mention the flat address from the list given to you)

Could you please tell me if the flat is still available?

If the agent says no,

Say: Thank you. And cut the call and move on to the next telephone number

If yes, please proceed

Is it possible to view the flat?

The following are the details they might need from you

Name:

Surname:

Current Address:

Postcode:

Contact Number:

Email Id:

Employment: IT Consultant

Full Time or Part Time: Full Time

Company: Beta IT Solutions

Pay Scale: £46,000; £52,000; £54,000 per year [The first pay should be used for first call, second for the second and so on. The order will vary for each session so make sure to confirm it before starting the calls]

Pets: No

Marital Status: Single

Do you Smoke? No

Possible date for viewing: Two days from the date of your call

Possible moving date: Flexible

Type of Contract: Long Term

Could you please tell me the deposit amount and agency fee?

Do I need to bring any documents for the viewing?

Could you please tell me the documents I need to submit if I decide to take the flat?

Thank You.

F Ethnicity Identification Survey (EIS)

In order to validate our assumption that the voice or accent we used in our survey to book viewings with estate agents conveyed information about the candidate’s ethnicity, we conducted an independent Ethnicity Identification Survey (EIS). The EIS was conducted as an online survey using the *Qualtrics* platform via multiple choice question on identifying the accent from the voice clips. The voice clips excerpts used were the recorded real-time application calls made by our trained callers. From the start of the telephone survey, we recorded all applications made by callers from the caller’s end .i.e., the call recordings were one-sided without capturing the voice of estate agents. This was done to test for caller consistency of calls made as well as for the purpose of this survey. The voice clips excerpts used for EIS were 12-14 seconds long. We omitted the section where applicant says his/her fictitious name in the voice clips used for EIS to avoid the potential bias in identification of ethnicity from the names and surnames used. The online survey was conducted amongst British nationals belonging to the age group of 22 to 45 years in full employment.

As mentioned before, the EIS was created using *Qualtrics* platform, which allowed for the distribution of survey link to participants falling under the prescribed category. The survey was compatible for opening in mobile application as well as in computers. Once a participant receives a link to complete the survey, they could click on it and it will take them to a page with participant information for the survey, which provided them with the details of the survey and what they are expected to do. It will be followed by a consent form which they have the option to agree if they wish to continue with the survey or disagree and opt out. As the survey was designed to include only British nationals, full-time employed, belonging to 22-45 years of age, those who did not meet the requirements, were automatically excluded from taking part in the survey. At the end webpage of the survey, participants were thanked for their time.

The sample size for EIS was 209. For accent identification, two voice clips of British and six voice clips of non-British callers (2 voice clips of EEA callers and 4 voice clips of non-EEA callers) were used for the survey. The respondents were asked to identify the ethnic region of the person based on voice clips excerpts they heard by clicking on the options given. They could only select one from the three options provided. The options were British, EEA, non-EEA. The options selected by the participants formed the data for EIS. For each question, we specified which all countries came under the category of EEA to avoid confusion. To ensure that all the participants read and completed the survey by reading through each question and options before answering, we restricted our sample to only those data which took the participant at least 200 seconds to complete (which was the minimum required time to go through them as per the observation from our pilot survey of EIS). For the purpose of our analysis, we have combined EEA and non-EEA to one category called non-British.

Table F.1 summarises the result for the voice identification part of the survey. The overall proportion of the respondents indicating how each voice clip is perceived is given in Table F.1. The rows of the table represent the ethnicity of trained caller (voice clip ethnicity) and columns represent the ethnicity identified for the

respective voice clips by the respondents. From Table F.1 results it is clear that 83.49 percent of the voice clips for British callers were correctly identified as British (column 2) and 81.02 percent of the voice clips of non-British callers were correctly identified as non-British. Only 16.51 percent of the British voice clips were wrongly perceived as non-British and 18.98 percent of the non-British voice clips were perceived as British. From this we can conclude that the respondents were largely able to identify the applicant’s ethnicity from the voice clips alone without even mentioning their name or surname. The trained telephone callers we used for our survey were good representation of the ethnicity we wanted to indicate to the estate agents. And justifies the use of accent or voice as one of the measure we used (the other being the name and surname of the caller we shared with the agents and at times they asked the caller from which country they belonged to) to indicate the ethnicity of the applicant and later to test discrimination in the rental housing market.

Table F.1: Accent identification of trained callers from the experiment via EIS

Voice Clip Ethnicity	Identified Ethnicity			
	British		Non-British	
	(1)	(2)	(3)	(4)
British	349	83.49	69	16.51
Non-British	238	18.98	1016	81.02

Note: Table shows the results of EIS on voice clip excerpts of the trained callers’ actual calls to the estate agents recorded during the telephone survey. The voice clip ethnicity indicates the ethnicity represented by the trained caller. Columns (1) and (3) indicate the number of people identifying the voice clip as that of a British and non-British person respectively. Columns (2) and (4) indicate the respective percentages.

G Agency Data Collection

To investigate the heterogeneous effects of the staff composition of estate agencies on the response rate, we collected and compiled a unique dataset on the staff details of the estate agents including their names and job titles for over 5,822 estate agencies in the UK. The agency details collected from the pool of advertisements of the experiment formed the basis for this data collection. The data was collected via online search on the estate agent’s website to extract details of the staff composition of the particular letting agency. We focused on the staff primarily handling lettings department. We collected the full names and job titles of the staff including the managing directors in the letting departments of the estate agencies under consideration. The data collected has a maximum of 8 individual estate agency staff details. In general, the estate agencies can be categorised into large/medium estate agencies having a number of branches through out England, small letting agencies with only a single office functioning locally and other individual landlords. When we collected the data for estate agencies from their web portals, we categorised them as follows: (i) head office (head office

of a large letting agency), (ii) branch (branch of a large letting agency), (iii) independent (small independent letting agency) and (iv) not applicable (no information available on the type of the letting agency). We also created a variable for the range of availability of staff data on specific web portal. We indicated it as (i) available: if the full name and position held is given on the web portal, (ii) not available: if no information is available, (iii) only photo available: for agency web portals where only photos of the estate agency staff were given without their names and positions held.

H Internal Review Board (IRB) Approval

The research method/protocol of the main experiment has been reviewed and approved by the University of Leicester Research Ethics Committee under the application number 7782-nr141-economics in June 2016 and registered with the AER RCT registry, under AEARCTR-0008426 Registry number. The research protocol for the Ethnicity Identification survey was also reviewed and approved by the University of Leicester Research Ethics Committee under the application number 14265-nr141-ss/bu:economics in Dec 2017.

For the main experiment where randomly allocated callers with or without foreign accents contacted estate agents and asked for a viewing of advertised properties meeting predefined criteria, no informed consent from the subjects were sort. The primary reason for this is that declaring to subjects (landlord and their agents) that they were part of an experimental study (on discrimination in the rental market) would severely bias their way the act upon the researchers making contact and would render the results of the study useless. We conduct the experiment in line with a rich history of very similar studies using the same experimental design (Thorat et al., 2015; Ahmed and Hammarstedt, 2008; Baldini and Federici, 2011; Bosch et al., 2010; Hanson and Santas, 2014; Ondrich et al., 2000; Page, 1995; Massey and Lundy, 2001).

We remain in full compliance with the Data Protection Act, under section 33, as:

- Data will not be used to support measures or decisions with respect to specific individuals. The information collected will be stored anonymously and will not be used for any other purpose or stored beyond the length of this project.
- Use of the data will not cause substantial damage or distress to specific individuals. The experiment itself will mean minimal interruption of individuals involved and will be designed such that the share of the very slight burden on rental agents will be distributed equally among agents in England, Wales and Scotland.
- The research is in the substantial public interest.

There is not yet any credible evidence on the effect of the ‘right-to-rent’ scheme on discrimination in the UK rental market and this study will aim at filling this gap and provide policy makers, landlords and agents,

and the public with credible evidence on the existence of discrimination in the UK rental market. As we will contact rental agents with fictitious contact details there will be a minimal burden associated with these requests regarding the workload of rental agents. The number of calls we will be making is nevertheless minimal compared to the overall number of requests these agents receive on a daily basis. Furthermore, as we are spreading out the telephone calls across the entire UK and randomly select adverts by agents, no particular agent or agents in a particular area will be subject to a higher burden in dealing with these requests. In line with standard practice we called back the subject within 48 hours or before the fixed viewing time (whichever is the earliest) to cancel the viewing or send a text to their contact number with a polite message turning down the offer.

As for the Ethnicity Identification Survey, it was conducted via the University of Leicester Ethics approved *Qualtrics* platform. We used the platform for recruiting our panel of participants as well as running the survey. Our *Qualtrics* panel only include British nationals, aged 22-45 and in full-time employment. The *Qualtrics* panel was asked for consent to take part in the survey and they are also informed of the nature of the questions before proceeding with the survey. No individual data was collected for the research. Only general information on the participants were collected. The data collected will not identify individuals and therefore will maintain confidentiality and privacy of all participants. The voice calls that will be used for the survey are from the telephone callers we used to conduct the experiment for which prior consent was gained from the telephone callers. The following participant information sheet and consent form was provided to the subjects

H.1 Participant Information Sheet

You are being invited to participate in a research study titled “Who has the Right to Rent? Testing for Discrimination in the English Rental Market”. This study is being done by Dr Martin Foureaux Koppensteiner, Dr Tania Oliveira and Ms Nikitha Rohith from the University of Leicester.

This online survey is part of a larger academic project we are running to test for ethnic discrimination in rental housing market in England. The purpose of this questionnaire is to understand the ethnic soundness of the applicant names we used as part of our online experiment for the above mentioned project.

This survey comprise of 12 questions. For each question, you will be provided with a set first names and surnames of people from ethnicities representing different EEA and non-EEA countries or voice recordings of people from ethnicities representing different EEA and non-EEA countries . You will be asked to identify the names/voice belonging to a particular region/countries specified in the question.

It will take you approximately 5-10 minutes to complete the survey.

Your participation in this study is entirely voluntary and you can withdraw at any time. You are free to omit any question.

We believe there are no known risks associated with this research study; however, as with any online related

activity the risk of a breach is always possible. To the best of our ability all the information that we collect about you during the course of the research will be kept strictly confidential. You will not be able to be identified in any reports or publications. The data collected during the course of the project might be used for additional or subsequent research.

H.2 Consent form

By selecting agree,

I agree that I have read and understood the Participant Information Sheet and have agreed to take part in this project.

I understand that my participation is voluntary and that I am free to withdraw at any time without giving a reason.

I understand that the information provided by me in this questionnaire will be archived, and re-used for future research if needed and will not be used in any manner which would allow identification of my individual responses.

Agree

Disagree