# A Field Experiment on Discrimination against Foreigners in the Rental Housing Market in Japan Examining the 23 Wards of Tokyo

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## Abstract

Discrimination against foreigners in rental housing markets has been recognized mainly in the U.S. and European countries. In Japan, the difficulties experienced by foreigners' moving into rental housing have been reported only by media or government questionnaire surveys, but quantitative evidence is lacking. We conduct a correspondence study to observe discrimination against foreigners in rental housing markets in Tokyo's 23 wards during December 2019 and February 2020. Our results show that using a Chinese or Korean name decreases the probability of receiving affirmative responses to the desire to move into rental housing by approximately 13% compared with inquiries using Japanese names. In addition, we find that the COVID-19 crisis increased the discriminatory behaviors of rental housing owners and realtors. To solve the moral issues related to correspondence studies, we asked people who were actually planning to move to Tokyo's 23 wards to cooperate in the survey.

## Keywords

Real Estate Economics, Discrimination against Foreigners, Rental Housing Markets, Field Experiment, Correspondence Study, COVID-19.

# **Classification Codes**

R310 Housing Supply and Markets,

#### 1. Introduction

Japan has been affiliated with the International Convention on the Elimination of All Forms of Racial Discrimination (ICERD), which forbids members from discriminating based on race, ethnicity or tribe, since 1996. Although ICERD also prohibits discrimination against foreigners' moving into residences, there are many reports of discriminatory behaviors against foreigners in rental housing markets in Japan. Ministry of Justice of Japan (2017) studied 2,044 foreign people looking for residences over last five years and found that 804 (39.3%) foreigners have experienced rejection based on their racial characteristics.

In Japan, there is an increase in immigrants despite this situation. Between 1995 and 2015, the foreign population increased from approximately 1.14 million (0.9% of the population) to approximately 1.75 million (1.4%) according to the national census (2015). In addition, the Revised Immigration Control and Refugee Recognition Law came into force in April 2019, which aimed to eliminate shortages in the working population. Based on the law, the Japanese government plans to accept up to 345 thousand foreigners until 2024. The demand for residences will increase as the foreign population increases.

However, discrimination against foreigners in rental housing markets could prevent the smooth inflow of foreign laborers in Japan. Moreover, if there is irrational (for instance, taste-based) discrimination against foreigners, the housing market will become inefficient as the number of foreigners increases.

Theoretical economic studies have divided the definitions of discrimination into two ways. First, "taste-based discrimination" is irrational discrimination caused by conscious or unconscious prejudices (Becker, 1957), while "statistical discrimination" is more rational, being based on supplementing missing information about objects with statistics (Aigner and Cain, 1977; Arrow, 1973; Phelps, 1972). Since tastebased discrimination causes decreases in market efficiency, eliminating such discrimination is desirable. However, statistical discrimination is the result of rational decisions and does not present an issue regarding market efficiency. We need to distinguish statistical discrimination from taste-based discrimination to evaluate the impacts of discrimination on markets.

We focus on the rental housing markets of Tokyo's 23 wards and conduct a correspondence study to observe differences in realtors' responses to Japanese and foreign (Chinese and Korean) applicants. To the best of our knowledge, this is the first study that empirically quantifies the difficulties experienced by foreigners in moving into rental housing in Japan. We focus on Chinese and Korean people as foreigners, as these two ethnicities occupy a large share of the foreign population ratio in Japan.<sup>1</sup>

We sent 1,136 inquiries via e-mail to 568 randomized realtors in Tokyo's 23 wards between 4 December 2019 and 20 February 2020. Every realtor received two inquiries, one from Japanese applicant and the other from a foreign applicant. We performed a regression analysis of the 962 valid responses. The results of the analysis revealed that writing a foreigner's name in an inquiry reduces the probability of receiving a positive response from the realtor by 13% compared to using a Japanese name. This result does not largely change even when we control the percentage of foreigners in the area served by the realtors or where the rental housing was located. In addition, we also find that the COVID-19 pandemic (after January 2020) decreases the

<sup>&</sup>lt;sup>1</sup>According to the national census (2015), the Chinese population of Japan is approximately 511 thousand (29.2% of total foreign population), and the Korean population is approximately 377 thousand (21.5%). If discrimination exists against Chinese and Korean applicants, the impact would be serious in the rental housing market.

foreign applicants' probability of receiving a response from realtors and that the received responses were more often not affirmative.

Because the correspondence study method creates fictional inquirers, it has ethical issues from compelling the targeted realtors or owners to invest opportunity costs in the form of their time although the researchers do not plan on signing leases.<sup>2</sup> To solve the problem, we worked with individuals who were actually considering moving into Tokyo's 23 wards at the time our study was conducted. Because we did not create fictional inquirers, our sample size was decreased, and we less strictly controlled the timing with which inquiries were sent to realtors compared previous studies. We controlled the timing of the sent inquiries as much as possible by randomizing each realtor in terms of whether the foreign applicants sent an e-mail earlier than the Japanese applicant.

The structure of this paper is as follows. The next section introduces previous studies focusing on discrimination in the rental housing market. Section 3 describes our estimation models, the variables used and the structure of our correspondence study. Section 4 discusses the results of our analyses. Section 5 presents the conclusion.

#### 2. Previous Studies

This section describes the previous studies related to field experiments focusing on discrimination in rental housing markets. An audit study is a method of conducting field experiments allowing observation of discriminatory behaviors in markets. Audit studies ask a pair of individuals with the same characteristics, experiences and behaviors to engage in face-to-face negotiations with realtors or landowners. The pair of collaborators only differ in the focal characteristic (ethnicity, age, gender, etc.), allowing the researchers to observe the impact caused by the difference on results (Fix and Struyk, 1993). Ayres and Siegelman (1995) focus on 153 new-car dealers in Chicago to observe discriminatory behaviors based on race and genders. Their results indicate that white males tend to receive higher discount rates on cars than white females or Blacks. As an example of research focusing on Japanese rental housing markets, Nakagawa (2004) conducts an audit study to observe discrimination by realtors against the elderly in Osaka. Nakagawa finds with statistical significance that elderly apartment seekers are introduced to less rental housing by realtors than those younger.

The audit study method is a strong approach to observing discriminatory behaviors in markets, but it has limitations. Turner et al. (1991) point out that explaining or training for experiments could make the auditors more aware, consciously or subconsciously, of discrimination, leading them to change their behavior. Heckman and Siegelman (1993) maintain that audit study methods cannot eliminate characteristics (for instance, height, style of dress, body shape, and so on), which have an impact on results even if researchers conduct training or randomization. For these reasons, audit studies in which the auditors conduct face-to-face negotiation with a realtor or landowners cannot control heterogeneity-related auditor impressions. A correspondence study can solve those issues of audit studies. Correspondence studies commonly create fictional applicants. The pair of fictional applicants sends inquiries to realtors, and each inquiry has the same text content except for the focal characteristics. If researchers are focusing on the impact of ethnicity on

<sup>&</sup>lt;sup>2</sup> In Japan, in particular, a correspondence study creating fictional inquirers can be regarded as a chargeable offence. *Fraudulent obstruction of business*. Article 233 of Penal Code defines the crime as follows,

<sup>&</sup>quot;A person who damages the credit or obstructs the business of another by spreading

false rumors or by the use of fraudulent means shall be punished by imprisonment with work for not more than 3 years or a fine of not more than 500,000 yen."

markets, one of the pair will have a name typical of the ethnic majority, and the other will have a name typical of an ethnic minority. Correspondence studies have advantages over audit study methods because they have strict control over the communication text including the content being examined for causing discrimination. Moreover, the correspondence study method can decrease experiment costs, such as recruiting or training research supporters, and makes it easier to acquire a large sample. Bertrand and Mullainathan (2004) pioneered the correspondence study, using it to observe discriminatory behaviors against minority races in labor markets. They created fictional resumes with matching characteristics except for the applicants' names and sent two resumes to recruiting firms (their categories are restricted to sales, administrative supports, clerical services, and customer services) in Boston and Chicago. Bertrand and Mullainathan used names typical for white and African Americans as a signal of race to estimate the impact of information about race on recruiting processes. They found that resumes with African American names were less likely to proceed to the next step of the recruiting process than resumes with a name typical for white Americans.

The correspondence study method has also been adopted to observe discriminatory behaviors in rental housing markets. Bertrand and Duflo (2017) introduce nine correspondence studies focusing on discrimination based on ethnicity in rental housing markets. In rental housing markets of the United States, white Americans tend to receive more affirmative responses from landowners than Middle Eastern or Black Americans (Carpusor and Loges, 2006; Ewens et al., 2014). Hanson and Hawley (2011) conducted a correspondence study controlling regional racial structures around the housing inquiry. They found that using names typical of White Americans increases the probability of receiving affirmative responses by 12% compared to using names typical of African Americans, and the magnitude reaches its maximum in regions where the population shares of the two races are comparable.

For European countries, Bartoš et al. (2016) conducted correspondence studies in Czech rental housing markets. They found that using Czech names increased the likelihood of receiving an affirmative response from the landlord by 27% compared to using Roma or Asian names. Baldini and Federici (2011) and Bosch et al. (2010) focused on discriminatory behaviors against immigrants in rental housing markets. Baldini and Federici (2011) studied Italian rental housing markets and found that individuals with typical Middle Eastern and East European names faced greater difficulties receiving affirmative responses from landlords compared to those with Italian names. Bosch et al. (2010) focused on the case of Spain and found that inquiries using Spanish names received 44% more affirmative responses than those using Moroccan names. They also found that additional positive information about applicants could decrease discriminatory behaviors against Moroccans. There are also several correspondence studies about Swedish cases focusing on discrimination against people of Middle Eastern descent (Ahmed et al., 2010; Ahmed and Hammarstedt, 2008; Carlson and Eriksson, 2014). Those studies show that Swedes (especially Swedish males) have advantages over Middle Eastern apartment seekers in Swedish rental housing markets. Oh and Yinger (2015) surveyed field experiments in Canada and European countries and observed discrimination in rental housing markets. Hogan and Berry (2011) conduct a correspondence study on rental housing markets in Toronto and find that ethnic minorities receive fewer affirmative responses than Canadian minorities (12% in Middle Eastern cases, 7% in Asian cases, and 5% in Black cases). In Norway, inquiries from people with typical Middle Eastern names receive 13% fewer affirmative responses than those using Norwegian names.

Previous studies have mainly focused on the United States and European countries, and discriminatory behaviors in Japanese rental housing markets have not been explored. This research is a pioneering correspondence study in the rental housing market of Tokyo's 23 wards aiming to observe discrimination

against Chinese and Korean apartment seekers. Distinct from most previous studies, which sent inquiries to landlords, we sent inquiries to realtors to conduct the correspondence study.<sup>3</sup>

## 3. The Estimation Model and Experimental Design

#### 3.1. The Estimation Model

This chapter describes the estimation model used to test for discriminatory behaviors against foreigners in rental housing markets. The linear probability model is as follows:

$$R_i = \alpha_I + \alpha_F F_i + E_i + u_i. \tag{1}$$

where  $R_i$  is a dummy variable that identifies the behaviors of the realtors for property *i*. There are two types of dummy variables that identify the behavior of a realtor. The first dummy variable represents a response from the realtor; it is 1 if the realtor responds, and 0 otherwise. The second dummy variable captures the content of that response; if there is an affirmative response from the realtor to their interest in the rental property, it is 1, and 0 otherwise. Each of the two dummy variables is used as the dependent variable in each estimation.  $F_i$  is a dummy variable that equals 1 if the applicant is Chinese or Korean.  $E_i$  is a variable used to see if the experimental design affects the response rate of the realtor and is a vector composed of dummy variables. The experimental design issue that may affect the results of the analysis is whether the Japanese or the foreign applicant was the first to contact the realtor about property *i*. There are two different texts used for the inquiry. Thus, one dummy variable takes 1 if the collaborator contacted property *i* first and 0 otherwise. The other dummy variable identifies which text was used in the inquiry.  $u_i$  is the error term. Based on the results of previous studies, we expect that foreigners have a lower probability of receiving affirmative responses from realtors than Japanese applicants ( $0 > \alpha_F$ ).

#### 3.2. The Experimental Design

This section describes the design of our experiment. In this study, two inquiries are made to randomized realtors in the 23 wards of Tokyo with the same content via the Internet. One inquiry is from a Japanese person, and the other is from a foreigner (Chinese or Korean). We observe whether a response is received and its content, with content being either affirmative regarding their inquiry or not.

For the selection of realtors for rental housing, 568 realtors were randomly selected from the realtors registered with LIFULL HOME'S who could be contacted by email or inquiry form.<sup>4</sup> Therefore, realtors that do not operate via the Internet were excluded from the survey. In recent years, the use of the Internet to provide housing information has become mainstream for rental housing brokerage services. Therefore, we believe that extracting realtors registered with LIFULL HOME'S does not deviate from actual market

<sup>&</sup>lt;sup>3</sup> In Japan, landlords in the rental housing market commonly consign advertising and rental contracts to realtors. Therefore, sending inquiries to realtors conforms to the customs of the Japanese rental housing markets.

<sup>&</sup>lt;sup>4</sup>LIFULL HOME'S is one of the most popular services supplying rental housing information. It includes 2,988 realtors and 4,070,093 rental housing listings as of 17<sup>th</sup> April 2020. The number of included realtors changes daily.

conditions.<sup>5</sup> In addition, we exclude realtors without an e-mail address or Internet inquiry form from our sample. The randomly selected realtors had published their available rentals on the Internet, and we randomly selected only one property for rent from among those available for each of the selected realtors and sent an inquiry.

As mentioned earlier, correspondence studies have an ethical issue from creating fictitious inquiries that represent opportunity costs to realtors and property owners. To address this issue, we identified people who were planning to move into rental housing in Tokyo's 23 wards at the time of the experiment and asked them to make the inquiries to realtors. In addition, we checked that they were interested in the rental houses they were inquiring about before they sent their inquiry to the realtor.

We assigned our experimental collaborators the text and the date of their inquiries, and they reported to us whether a response was received from the realtor and its content.<sup>6</sup> There was a total of 67 experimental collaborators, 47 Japanese, 13 Chinese and 7 Koreans,<sup>7</sup> all of whom were male. We chose to have all male collaborators because it was not possible to obtain an efficient sample size to discriminate between the sexes due to the high cost of recruiting collaborators. For each property, we also randomly specified whether a Chinese or a Korean collaborator would make the inquiry.

Two texts were prepared for the inquiries to the realtors. The text used by the Japanese collaborators was randomly selected for each property, and the foreign collaborators then used the other text for their inquiries. The inquiry asked if the property was vacant and if it was available for viewing, and the text was designed so that there would be little difference in content and Japanese language level between the two inquiries. The race of the inquirer was used as a signal to the realtors by including the name of the inquirer at the beginning and end of the inquiry text. This is a common approach adopted in previous correspondence studies.

One of the adverse effects of employing people to conduct correspondence studies is that we cannot strictly control the timing when the inquiries are sent. It is difficult to send two inquiries at the same time, unlike in the correspondence studies sending fictional inquiries. There is a possibility that the realtors would give priority to the inquiry sent earlier, and the time lag between inquiries could affect the results of our experiments. To reduce this impact, we controlled it as best as possible by randomly assigning whether the Japanese or foreign collaborator would contact each realtor first and specifying to all collaborators when the inquiry should be sent (e.g., on the night of December 10). The experiment was conducted between December 4, 2019, and February 20, 2020.

## 3.3. Data

<sup>&</sup>lt;sup>5</sup> The Ministry of Land, Infrastructure and Transport (2019) surveyed 310 individuals and found that 74.5% of the respondents used Internet services to search rental housing information (http://www.mlit.go.jp/common/001320850.pdf).

<sup>&</sup>lt;sup>6</sup> The collaborators reported to us that they received a response and the text of that response from realtors. We did not follow up on the results after the first reply or on whether the collaborators ultimately moved into one of the rental houses.

<sup>&</sup>lt;sup>7</sup> The number of inquiries per collaborator is different between the ethnicities. On average, the Japanese collaborators sent 10 inquiries, the Chinese collaborators sent 26 inquiries, and the Korean collaborators sent 17 inquiries.

This section describes the sources of our data. To calculate the ratio of foreign residents in the vicinity of each realtor and property, we used the Tokyo Statistical Yearbook 2018.<sup>8</sup> We refer to LIFULL HOME'S to collect data about rental housing (rent, address, footprint).

Table 1 shows the descriptive statistics. We find that 67% of the Japanese collaborators received responses to their inquiries from realtors, and this rate is higher than that for the foreign collaborators (59%). In addition, 49% of the responses to the Japanese collaborators were affirmative regarding the availability and the willingness to show the rental housing, which is a higher probability than that of the foreigners (36%). We observe whether these differences are statistically significant by using an estimation model.

	·	N	Mean	Sd	Max	Min
Japanese	Response	481	0.67	0.47	1	0
	Affirmative response	473	0.49	0.50	1	0
	Text a dummy	481	0.48	0.50	1	0
	First inquiry sent	481	0.49	0.50	1	0
Foreigners	Response	481	0.59	0.49	1	0
	Affirmative response	473	0.36	0.48	1	0
	Text a dummy	481	0.52	0.50	1	0
	First inquiry sent	481	0.51	0.50	1	0
Common	Response	962	0.63	0.48	1	0
	Affirmative response	946	0.43	0.49	1	0
	Text a dummy	962	0.5	0.50	1	0
	First inquiry sent	962	0.5	0.50	1	0
	Rent (yen)	960	81,550	28,322	198,000	28,000
	Footprint (m <sup>2</sup> )	962	24.07	6.31	40	7
	Foreign population share of ward where realtor is located	948	0.057	0.027	0.122	0.025
	Foreign population share of ward where housing is located	922	0.052	0.025	0.122	0.025
	Foreign population share of area where realtor is located	950	0.049	0.045	0.319	0.007
	Foreign population share of area where housing is located	950	0.036	0.033	0.387	0.005

 Table 1. Descriptive statistics

Table 2 describes the number of realtors and properties in our study by ward. Since there are cases in which realtors are located in wards other than the focal property, the number of realtors and that of properties are not equal. In our sample, the Setagaya ward has 37 realtors, and it is the largest, while the Sumida ward with 5 realtors is the smallest. The Oota ward has the most (42) rental properties, while the Chiyoda ward has the fewest (5) properties. Table 2 also describes the number of realtors and households in each of Tokyo's 23

<sup>&</sup>lt;sup>8</sup> We adopt "2-4 FOREIGN RESIDENTS BY DISTRICT AND NATIONALITY (2015-2019)". The statistic describes the foreign population by district and nationality as of January 1, 2019.

wards. Comparing these ratios, no large difference is found between the number of properties we surveyed and the number of households in each ward. However, there are differences between the number of realtors in our sample and the actual number of realtors in each of Tokyo's 23 wards. This could reflect regional bias in the registration tendency of realtors.

	The Number of Estate Agents in our Sample	The Share of Estate Agents in our Sample (%)	The Total Number of Estate Agents	The share of Estate Agents (%)	The Number of Rental housings in our Sample	The Share of Rental Housings in our Sample (%)	The Number of Households	The Share of Households (%)
Chiyoda ward	16	3.3	860	9.9	5	1.0	37,152	0.7
Chuo ward	11	2.3	879	10.1	7	1.5	94,807	1.8
Minato ward	36	7.5	820	9.4	17	3.5	147,693	2.8
Shinjuku ward	35	7.3	723	8.3	26	5.4	221,720	4.2
Bunkyo ward	11	2.3	247	2.8	14	2.9	123,849	2.4
Taito ward	7	1.5	505	5.8	10	2.1	121,489	2.3
Sumida ward	5	1.0	157	1.8	8	1.7	153,656	2.9
Koto ward	11	2.3	160	1.8	17	3.5	270,818	5.2
Shinagawa wara	23	4.8	250	2.9	20	4.2	225,190	4.3
Meguro ward	15	3.1	170	2.0	17	3.5	158,223	3.0
Ota ward	28	5.8	330	3.8	42	8.7	396,961	7.6
Setagaya ward	37	7.7	282	3.2	41	8.5	487,174	9.3
Shibuya ward	35	7.3	522	6.0	20	4.2	139,725	2.7
Nakano ward	20	4.2	114	1.3	23	4.8	207,909	4.0
Suginami ward	26	5.4	200	2.3	34	7.1	325,606	6.2
Toshima ward	28	5.8	353	4.1	17	3.5	180,595	3.4
Kita ward	19	4.0	122	1.4	14	2.9	198,711	3.8
Arakawa ward	11	2.3	59	0.7	8	1.7	117,228	2.2
Itabashi ward	20	4.2	134	1.5	33	6.9	314,492	6.0
Nerima ward	20	4.2	160	1.8	23	4.8	377,837	7.2
Adachi ward	22	4.6	195	2.2	26	5.4	352,835	6.7
Katsushika ward	17	3.5	111	1.3	16	3.3	236,600	4.5
Edogawa ward	21	4.4	126	1.4	22	4.7	345,833	6.6
Sum	481		8,708		481		5,236,103	

 Table 2: Wards Share of the Estate Agents and the Housings

We refer Basic Resident Register (2020), recording the number of households at Jan 1 2020, to observe the number of households in each wards.

We refer Economic Sensus for Business Activity (2016) to observe the number of estate agents in each Tokyo 23 wards

## 4. Estimation Results and Discussion

## 4.1. The Probability of Receiving a Response from Realtors

This section describes and discusses the estimation results. Table 3 shows the results of the estimation using the existence of responses from realtors as the dependent variable. We use robust standard error clustered by the wards where the rental housing is located.

Table 3: The Estimation Result_The Existence of Responses from Estate Agents									
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	
Eastign of Dummy	-0.0769***	-0.0769***	-0.0763***	-0.0763***	-0.0764***	-0.0816***	-0.0730***		
Foreigner Dummy	(-3.863)	(-3.776)	(-3.837)	(-3.750)	(-3.736)	(-3.989)	(-3.491)		
Jananese Dummy								0.0734***	
Japanese Dunniy								(3.209)	
Korean Dummy								-0.0407	
Korean Dummy								(-0.959)	
log Rent					0.0846				
log_lont					(1.690)				
Foreign Population Share of						0 704			
Areas where Inquired Estate						(1.360)			
Agents Locate in									
Foreign Population Share of							-0.513		
Housings Locate in							(-0.861)		
			0.0296	0.0286	0.0295	0 0 2 8 8	0.0202	0.0210	
Text A Dummy			(1 173)	-0.0280	(1.126)	(1.102)	(1.185)	(1.257)	
			(-1.175)	(-1.140)	(-1.130)	(-1.195)	(-1.103)	(-1.257)	
Earlier Inquire Dummy			(0.541)	(0.520)	(0.535)	(0.759)	(0.540)	(0.444)	
Ward where Estate Agents locate	N	v	(0.341) N	(0.329) V	(0.555) V	(0.759) V	(0.340) V	(0.444) V	
Ward where Housings locate in	N	ı v	N	v	v	v	v	v	
ward where mousings locate in	0 660***	0 613***	0.678***	0.621***	-0.315	1 0 590***	1 0 664***	1	
Constant	(26.36)	(7, 278)	(26.07)	(7.400)	(-0.515)	(7.091)	(7.616)	(6 5 6 6)	
	(20.50)	(7.278)	(20.07)	(7.400)	(-0.585)	(7.091)	(7.010)	(0.500)	
Observations	962	962	962	962	960	950	950	962	
R-squared	0.006	0.088	0.007	0.089	0.090	0.088	0.090	0.091	

Table 3: The Estimation Result\_The Existence of Responses from Estate Agents

Robust t-statistics in parentheses

Columns (1)-(7) show that using a foreign name decreases the probability of receiving a response from the realtors with statistical significance at the 1% level. Column (1) shows the magnitude of the baseline estimation result: using a foreign name in inquiries decreases the probability of receiving a response from realtors by approximately 7.7% compared with using a Japanese name. Columns (2) and (4)-(7) use the ward dummy variables to control the effects of wards where the realtors or properties are located. Columns (3)-(7) use the dummy variables controlling the text used and whether the inquiry was the first or second sent to the realtor. According to columns (2)-(7), using a foreigner name in the inquiry decreases the probability of receiving a response from realtors by 7.3-8.2% compared to using a Japanese name. These results are consistent with our hypothesis that foreign people experience difficulty obtaining responses in rental housing markets. In addition, we find that the text used and the order with which the inquiries were sent do not have significant effects on the probability of receiving a response from realtors. The result suggests that randomized texts and the order of inquiries do not affect our estimation results. We add the logarithmic rents of the inquiry properties to column (5), the foreign population share of the area where the realtor is located to column (6) and the foreign population share of the area where the rental property is located to column (7), but none of these have a significant impact on the likelihood of receiving a response from realtors.

Column (8) uses the dummy variables identifying the ethnicity, Japanese or Korean, of the collaborators as explanatory variables. Chinese is the baseline for ethnicity and is compared with Japanese or Korean. Realtors could distinguish the ethnicity of the person making the inquiry based on the name used in the inquiry text.<sup>9</sup> The result in column (8) shows that using a Japanese name increases the probability of receiving a response from realtors at the 1% level of statistical significance. However, there is no significant difference in the probability of receiving a response between inquiries using a Chinese or Korean name. The coefficient shows that Japanese inquirers have an approximately 7.3% greater opportunity to receive responses from realtors than Chinese inquirers.

Table 4 adopts the dummy variable identifying whether an affirmative response was received about the availability and willingness to show the rental properties as the dependent variable. Columns (1)-(7) use the foreigner dummy variable as an explanatory variable. We find that the foreigner dummy has significant negative effects on the probability of an affirmative response to the inquiry. The coefficients show that using a foreign name in inquiries decreases the probability of receiving an affirmative response by 12.5-13 percent, which is a larger magnitude than that shown in Table 3. We control logarithmic rents in column (5), foreign population share of the area where the realtor is located in column (6) and the foreign population share of the area where the realtor is located in column (6) and the foreign population share of the area where the negative impact of using a foreign name for the inquiry on the probability of receiving an affirmative response from realtors. Column (8) estimates the impact of using a Japanese or Korean name in inquiries on the result. The result shows that the Japanese dummy has positive effects on the probability of receiving an affirmative response at a 1% significance level, whereas using a Korean name does not significantly affect the result. The coefficients show that using Japanese names in inquiries increases the probability of receiving affirmative response at a 1% significance level, whereas using a Korean name does not significantly affect the result. The coefficients show that using Japanese names in inquiries increases the probability of receiving affirmative responses from realtors by approximately 11.9 percent compared with

<sup>&</sup>lt;sup>9</sup> We asked our collaborators to write their Chinese name in Chinese characters or their Korean name in Katakana characters, a type of Japanese phonetic syllabaries, to express their ethnicity. The notations abide by the broadcast guideline of NHK (2015) and are common writing methods for identifying Chinese and Korean names in Japan.

using Chinese names. Since there is no significant difference between using a Chinese or Korean name, realtors and owners of rental properties do not have high interest in the specific ethnicity of foreign inquirers.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Foreigner Dummy	-0.127***	-0.127***	-0.126***	-0.126***	-0.129***	-0.130***	-0.125***	
Poreigner Dunning	(-8.802)	(-8.606)	(-8.593)	(-8.401)	(-8.050)	(-8.394)	(-8.215)	
Jananese Dummy								0.119***
sapanese Dunning								(4.615)
Korean Dummy								-0.0400
Rorean Dunniy								(-0.716)
log Rent					0.127*			
log_kent					(1.741)			
Foreign Population Share of						6 860 05		
Areas where Inquired Estate						(-0.646)		
Agents Locate in						. ,		
Foreign Population Share of							-6.03e-05	
Areas where Inquired Rental Housings Locate in							(-0.547)	
Housings Locate in			0.01.40	0.01.40	0.0116	0.0110	0.0100	0.0150
Text A Dummy			-0.0140	-0.0140	-0.0116	-0.0119	-0.0122	-0.0176
			(-0.600)	(-0.586)	(-0.474)	(-0.546)	(-0.518)	(-0.749)
Earlier Inquire Dummy			-0.00877	-0.00877	-0.00633	-0.00655	-0.0106	-0.0112
			(-0.404)	(-0.395)	(-0.287)	(-0.293)	(-0.451)	(-0.483)
Ward where Estate Agents locate	N	Y	N	Y	Y	Y	Y	Y
Ward where Housings locate in	N	Y	N	Y	Y	Y	Y	Y
Constant	0.490***	0.456***	0.502***	0.467***	-0.941	0.475***	0.493***	0.353***
	(24.02)	(15.39)	(25.94)	(16.32)	(-1.169)	(13.14)	(12.75)	(9.076)
Observations	946	946	946	946	944	934	936	946
R-squared	0.016	0.091	0.017	0.091	0.096	0.092	0.094	0.092

Table 4: The Estimation Result\_Receiving Affirmative Responses to introduce inquired housings

Robust t-statistics in parentheses

There are two types of discriminatory behavior based on ethnicity or gender: taste-based discrimination is based on individual (irrational) tastes, while statistical discrimination revises incomplete information about objects using statistics related to ethnicity or gender. Since statistical discrimination is caused by incomplete information about the inquirers, it could decrease if additional information was supplied to realtors. To observe the impact of positive information on the responses from realtors, we divide our sample based on the median of the inquired properties' rents. For inquiries about housing with higher rents, there is potential to reduce statistical discrimination by signaling that the person making the inquiry is earning a higher income. In Table 5, columns (1) and (2) show the results of the analyses using samples divided by the median of rents. Column (1) uses the sample below the median rent, and Column (2) uses the sample with abovemedian rents. Both columns (1) and (2) show that the foreigner dummy has a negative effect on the probability of receiving affirmative responses from realtors with statistical significance. We focus on the coefficients and find that using a foreign name for the inquiry decreases the probability of receiving an affirmative response by 13.5% in column (1) and 11.5% in column (2). We interpret the results as indicating that inquiring about more expensive housing serves as positive information about the person making the inquiry and diminishes discriminatory behaviors in rental housing markets. However, using a foreign name still has negative impacts on the results, even in column (2). It is not clear whether the effects are caused by statistical discrimination or taste-based discrimination.

Tuble 51 The Ebimation Result_Receiving Thinmative Responses to infordate infanta neusings								
	Lower than Higher than Median Rents Median Rents		Lower than Median Foreign Populatoion Share of areas where Estate Agents Locate in	Higher than Median Foreign Populatoion Share of areas where Estate Agents Locate in	Lower than Median Foreign Populatoion Share of areas where Rental Housings Locate in	Higher than Median Foreign Populatoion Share of areas where Rental Housings Locate in		
	(1)	(2)	(3)	(4)	(5)	(6)		
Foreigner Dummy	-0.135***	-0.115***	-0.145***	-0.109***	-0.133***	-0.117***		
Poleigner Dunning	(-5.048)	(-3.852)	(-4.440)	(-3.320)	(-4.387)	(-3.813)		
Tart & Demonst	-0.00628	-0.0223	-0.0505*	0.0208	0.0174	-0.0451		
Text A Dummy	(-0.225)	(-0.501)	(-1.824)	(0.638)	(0.476)	(-1.301)		
Fastian In anting Demonstra	-0.0123	-0.00353	0.00292	-0.0190	-0.00625	-0.0128		
Earner Inquire Dummy	(-0.541)	(-0.107)	(0.0979)	(-0.654)	(-0.174)	(-0.554)		
Ward where Estate Agents locate in	Y	Y	Y	Y	Y	Y		
Ward where Housings locate in	Y	Y	Y	Y	Y	Y		
Creativet	0.410***	0.823***	0.405***	0.514***	0.351***	0.548***		
Constant	(10.53)	(3.934)	(6.925)	(12.53)	(5.650)	(10.01)		
Observations	496	450	470	476	460	486		
R-squared	0.135	0.145	0.159	0.168	0.133	0.208		

Table 5: The Estimation Result Receiving Affirmative Responses to introduce inquired housings

Robust t-statistics in parentheses

It is possible that the percentage of the population that is foreign at the location of the realtor or property affects discriminatory behaviors. To observe the effects, columns (3) and (4) divide the sample by the median of the foreign population share for areas where realtors are located; columns (5) and (6) separate the sample by the median of the foreign share in the area where the rental properties are located. Columns (3)-(6) show that using a foreign name decreases the probability of receiving an affirmative response to the housing inquiry. We focus on the magnitudes and find from columns (3) and (5) that a smaller foreign share tends to mean that the foreigner dummy has greater negative effects on discriminatory behaviors. We interpret this tendency to indicate that an increase in the percentage of foreigners in the vicinity will reduce the avoidance of foreigners by realtors and property owners. The results suggest that increases in the foreign population of surrounding areas make acceptance of foreign population inflow more likely through increased and more accurate information about the risks of doing business with foreigners. However, the estimation does not control for reverse causality in which areas showing less discriminatory behavior toward foreigners would tend to increase the foreign population share, and we only observe the correlation.

#### 4.2. Estimation with the Sample Limited to Responding Realtors Only

The dummy variable used in Tables 4 and 5 as the explained variable becomes zero not only when the responses are not affirmative but also when there are no responses from realtors. For this reason, the results of Tables 4 and 5 show the probability that the inquirers could advance to the next step of screening processes for moving into rental properties. The analyses enable us to estimate whether foreigners have the same opportunities to move into rental properties as Japanese people. However, we cannot observe whether there are differences in the content of the responses between Japanese and foreign collaborators.

We limit our sample to the 236 realtors replying to both Japanese and foreign inquirers to observe the difference in the content of responses received by Japanese versus foreign people. Realtors will decide whether to respond to inquiries, but a response indicating that the property is available and can be showed should not depend on the preferences of realtors. In addition, if the rental property has been already rented, the realtors would send a response rejecting the inquiry to both Japanese and foreign people even though we limit our sample, these differences in the responses received by Japanese and foreign people even though we limit our sample, these differences would reflect the intent of the owners of the rental properties. As the explained variable, we use the dummy variable, which is one if the realtor gives an affirmative response. Table 6 shows the estimation results.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Foreigner Dummy	-0.131***	-0.131***	-0.131***	-0.131***	-0.136***	-0.126***	-0.132***	
rorongnor Dummy	(-5.216)	(-4.971)	(-5.117)	(-4.876)	(-4.813)	(-4.594)	(-4.870)	
Japanese Dummy								0.140***
, i i i i i i i i i i i i i i i i i i i								(3.277)
Korean Dummy								0.0171
								(0.184)
log Rent					0.160			
0_					(1.495)			
Foreign Population Share of						-0.000162		
Areas where Inquired Estate						(-0.692)		
Agents Locate in								
Foreign Population Share of							0.000324	
Housings Locate in							(0.915)	
			0.00765	0.00765	0.0110	0.0120	0.00020	0.00400
Text A Dummy			0.00765	0.00765	0.0119	0.0120	0.00839	0.00480
			(0.311)	(0.296)	(0.434)	(0.469)	(0.323)	(0.186)
Earlier Inquire Dummy			-0.00561	-0.00561	-0.000827	-0.0100	-0.00632	-0.00606
			(-0.203)	(-0.193)	(-0.0295)	(-0.341)	(-0.216)	(-0.205)
Ward where Estate Agents locate in	N	Y	N	Y	Y	Y	Y	Y
Ward where Housings locate in	Ν	Y	Ν	Y	Y	Y	Y	Y
Constant	0.750***	0.785***	0.749***	0.784***	-0.977	0.818***	0.735***	0.646***
Contraint	(31.48)	(6.565)	(31.58)	(6.505)	(-0.826)	(6.505)	(5.744)	(4.635)
Observations	472	472	472	472	470	470	466	472
R-squared	0.020	0.139	0.020	0.140	0.149	0.145	0.155	0.141

Table 6: The Estimation Result\_Receiving Affirmative Responses to Introduce Inquired Housings

Robust t-statistics in parentheses

Columns (1)-(7) suggest that using a foreign name in the inquiry has negative effects on the probability of receiving an affirmative response regarding the rental property inquiry at a 1% significance level. Focusing on the magnitudes, we find that sending an inquiry using a foreign name decreases the probability of obtaining an affirmative response by approximately 12.6-13.6%. The results are not very different from the those shown in Table 4 (decreases in the probability by 12.5-13%).

Column (8) shows that the inquiries using Japanese names more frequently receive affirmative responses than the inquiries using Chinese names with statistical significance. However, there is no significant difference between using a Chinese or a Korean name. The coefficients suggest that using a Japanese name increases the probability of receiving an affirmative response from the realtor by approximately 14%.

We find that ethnicity affects the probability of receiving an affirmative response with statistical significance even though we limit the sample to only those realtors replying to inquiries from both Japanese and foreign people. The results suggest that rental property owners consider the ethnicity of inquirers and engage in discriminatory behaviors against foreign inquirers. However, we cannot distinguish whether the observed discriminations are caused by considering the risks of accepting inquiries from foreigners (rational discrimination) or reflect the irrational discriminatory taste of the owners.

Table 7 shows the results of estimations using the limited sample divided on the basis adopted in Table 5. Columns (1) and (2) use the sample divided by the median of rents. In columns (3) and (4), we separate our sample using the median for the foreign population share of the areas where the realtor is located. Columns (5) and (6) show the results for the estimations adopting the sample classified by the median of the foreign population share of the areas where the housing is located. As is the case with the results shown in Table 5, columns (1)-(6) with statistical significance suggest that foreigners find it more difficult to receive an affirmative response from realtors than Japanese people.

Table /: The Estimation Result_Receiving Ammative Responses to Introduce Inquired Housings									
	Lower than Median Rents	Higher than Median Rents	Lower than Median Foreign Populatoion Share of areas where Estate Agents Locate in	Higher than Median Foreign Populatoion Share of areas where Estate Agents Locate in	Lower than Median Foreign Populatoion Share of areas where Rental Housings Locate in	Higher than Median Foreign Populatoion Share of areas where Rental Housings Locate in			
	(1)	(2)	(3)	(4)	(5)	(6)			
Foreigner Dummy	-0.163***	-0.0872*	-0.139***	-0.121**	-0.146***	-0.118***			
	(-4.554)	(-1.946)	(-2.894)	(-2.714)	(-3.262)	(-3.064)			
Text A Dummy	0.0520	-0.0378	-0.00195	0.0106	0.0240	-0.0179			
	(1.302)	(-1.143)	(-0.0694)	(0.240)	(0.600)	(-0.357)			
Farlier Inquire Dummy	-0.0402	0.0334	0.0312	-0.0447	0.0217	-0.0357			
Eurier Inquite Builling	(-1.198)	(0.841)	(0.872)	(-1.168)	(0.498)	(-0.932)			
Ward where Estate Agents locate in	Y	Y	Y	Y	Y	Y			
Ward where Housings locate in	Y	Y	Y	Y	Y	Y			
Constant	0.807***	0.823***	0.565***	0.943***	0.507**	0.974***			
contraint	(6.194)	(3.289)	(4.445)	(7.131)	(2.372)	(8.860)			
Observations	244	228	248	224	234	238			
R-squared	0.191	0.217	0.157	0.317	0.257	0.310			

Table 7: The Estimation Result\_Receiving Affirmative Responses to Introduce Inquired Housings

Robust t-statistics in parentheses

The points observed in Table 7 are the results of columns (1) and (2). Column (1) uses the sample composed of rental properties with rents below the median. The result shows that using a foreign name decreases the probability of receiving an affirmative response at a 1% significance level. However, the statistical significance decreases to 10% in column (2), which uses the sample with rents above the median. The coefficient of column (1) suggests that using a foreign name in inquiries decreases the likelihood of receiving an affirmative response by 16.3%. However, the magnitude decreases to 8.7% in column (2). The differences between the coefficients (approximately 7.9 percentage points) is larger than those between columns (1) and (2) in Table 5 (approximately 2 percentage points). These results suggest that the owners facing the risk of accepting foreigners as renters react more acutely to an affirmative signal from inquirers than the realtors. These results imply that sending additional positive information to owners would increase the probability of receiving affirmative responses to rental inquiries.

## 4.3. The Impacts of the COVID-19 Crisis on Discriminatory Behaviors against Foreigners

The correspondence study was conducted between December 4, 2019, and February 20, 2020. In this period, COVID-19 spread from Wuhan, China, worldwide starting on December 8, 2019. In Japan, the first carrier of COVID-19 (the person was Chinese) was identified on January 15, 2020, and the COVID-19 pandemic had huge impacts on economic activities in Japan. To control the spread of COVID-19, on March 5, 2020, the Japanese government invalidated visas granted to Chinese and Korean citizens and restricted visits to Japan. Although is measure was taken after our experiments were completed, it is possibility that the responses of realtors or rental housing owners to foreign apartment seekers were influenced due to reports about COVID-19 even during the periods when we conducted our experiments.

We divide our sample by the median of the date on which the inquiries were sent (January 9, 2020) to control for the impacts of the COVID-19 pandemic on discriminatory behaviors in rental housing markets. COVID-19 began to be recognized early in January 2020.<sup>10</sup> Table 8 shows the estimation results.

(https://www.niid.go.jp/niid/ja/diseases/ka/corona-virus/2019-ncov/2488-idsc/iasr-news/9525-483p01.html). In addition, the Ministry of Health, Labor and Welfare first informed people of the occurrence and epidemic of COVID-19 as "Pneumonia of unknown cause in Wuhan, China" on January 6, 2020 (https://www.mhlw.go.jp/stf/newpage\_08767.html). The discovery of the first person positive for

<sup>&</sup>lt;sup>10</sup> In Japan, the first report of COVID-19 was announced as a cluster of serious acute pneumonia of unknown cause in China by National Institute of Infectious Diseases on January 3, 2020

COVID-19 was reported on January 15, 2020. The patient had stayed in Wuhan in China. These reports would have impacts on the discriminatory behaviors of realtors and owners in Japaneserental housing markets.

Columns (1) and (2) use the dummy variable that is assigned the value 1 if the realtor responds to the inquiry as the explained variable. Column (1) is the result of the estimation with the sample composed of only inquiries sent to realtors before January 9, 2020. We observe in column (1) that using a foreign name does not have significant effects on the probability of receiving responses. On the other hand, column (2) uses the sample that contains only inquiries after January 9, and shows that a foreigner name has negative effects on the probability of receiving a response at a 1% significance level. We focus on the coefficients and find that using a foreign name in inquiries decreases the probability of receiving a response by approximately 10.8% compared with using a Japanese name.

Columns (3) and (4) adopt the dummy variable identifying whether the responses from realtors are affirmative as the explained variable. According to columns (3) and (4), the foreigner dummy has negative impacts on the probability of receiving an affirmative response from realtors at a 1% significance level regardless of whether the inquiry was received before or after January 9, 2020. The coefficient of column (3) suggests that using a foreign name decreases the probability of receiving an affirmative response by approximately 9.6% compared with using a Japanese name. In column (4), the coefficient increases to approximately 15.7%. Columns (5) and (6) limit the sample to only those realtors replying to both Japanese and foreigners. As is the case with columns (3) and (4), the foreigner dummy significantly affects the probability of receiving an affirmative response from realtors in columns (5) and (6). The coefficient of column (5) shows that using a foreign name decreases the likelihood of receiving an affirmative response from realtors by approximately 10.1%. In column (6), the coefficient becomes approximately 16.6% when we use the sample limited to the inquiries sent after January 9.

Table 8 indicates that there is no significant difference in the probability of receiving responses between Japanese and foreigners before January 9, whereas the probability of receiving affirmative responses is negatively affected by foreign dummy with statistical significance even before January 9. One reason could be that there is a difference in the risks recognized regarding inquirers between realtors and rental housing owners.

In the Japanese rental housing market, some owners ask their realtors to reject foreign applicants. These discriminatory behaviors can reflect rational discriminations caused by considering the risks of the interested foreign residents and irrational discriminations based on the taste of owners. Rational discrimination could be based on the risk that foreigners are not aware of the manner of living in Japan, etc., whereas irrational discrimination can be thought of as discriminatory beliefs that the property owner holds against foreigners. Among these factors, rational risks, such as considering the possibility that foreigners may not comply with the manner of living in Japan, are factors that exist independently of the COVID-19 pandemic. For this reason, we consider the increase in magnitude of the foreigner dummy from columns (5) to (6) is caused by increases in owners' taste-based discrimination against foreigners from observing COVID-19 problems.

However, a realtor can refer a foreigner who is inquiring about housing to other available housing if the owner refuses to rent to a foreigner. Since these realtors can maximize their profits by introducing other rental housing to foreign applicants, there are no differences in the probability of receiving responses from realtors between Japanese and foreigners before January 9, the result of column (1) in Table 8. However, the occurrence of COVID-19 would increase the risk awareness of realtors regarding face-to-face interactions with foreigners, especially with Chinese people. The increases in the risk awareness of realtors would appear in column (2) in Table 8 as the significant negative effects of foreigner dummy on the probability of receiving a response from realtors. From the above discussions, we consider the increases in the negative impacts of the foreigner dummy shown in columns (3) and (4) to reflect increases in realtors' risk awareness around interacting with foreign applicants and an increase in taste-based discriminatory behaviors by owners caused by the COVID-19 pandemic. In addition, we also conduct the estimations with the sample divided by the date when the first person positive for COVID-19 was identified in Japan (January 15); there are not large differences in the results of Table 8.

Table 8: The Impacts of COVID-19 epidemic									
	Receiving Re	sponses or not	Receiving Affirmative Responses or not						
	Total S	Sample	Total S	Sample	Only Estate Agents Sending Responses to both Japanese and Foreigners				
	(1) Before Median of Experiment Dates	(2) After Median of Experiment Dates	(3) Before Median of Experiment Dates	(4) After Median of Experiment Dates	(5) Before Median of Experiment Dates	(6) After Median of Experiment Dates			
	-0.0443	-0.108***	-0.0961***	-0.157***	-0.101***	-0.166***			
r oreigner Dummy	(-1.647)	(-3.218)	(-3.843)	(-4.896)	(-2.837)	(-3.253)			
	-0.0298	-0.0276	-0.0193	-0.00827	0.00454	0.00912			
Text A Dummy	(-0.907)	(-0.694)	(-0.684)	(-0.198)	(0.129)	(0.211)			
Radia In ania Daman	0.0214	0.00540	-0.00466	-0.00872	0.000483	-0.00262			
Earlier inquire Dummy	(0.853)	(0.164)	(-0.174)	(-0.284)	(0.00986)	(-0.0571)			
Ward where Estate Agents locate in	Y	Y	Y	Y	Y	Y			
Ward where Housings locate in	Y	Y	Y	Y	Y	Y			
Constant	0.737***	0.534***	0.639***	0.369***	0.974***	0.688***			
Constant	(5.922)	(7.524)	(11.50)	(8.971)	(10.95)	(7.514)			
Observations	486	476	478	468	256	216			
R-squared	0.119	0.168	0.157	0.190	0.324	0.293			
Robust t-statistics in parentheses									

\*\*\* p<0.01, \*\* p<0.05, \* p<0.1

## 5. Conclusion

We conduct a correspondence study focused on rental housing markets in the 23 wards of Tokyo to observe the existence and magnitude of discriminatory behaviors by realtors and owners against foreign (Chinese and Korean) applicants. We sent 962 inquiries to 481 realtors and find that using a foreign name decreases the probability of receiving an affirmative responses to an inquiry regarding the availability of rental housing by approximately 13% compared with inquiries using Japanese names. Our results suggest that there are discriminatory behaviors against foreigners in Japanese rental housing markets. The results are consistent with previous studies performed in other countries on discrimination against foreign people in housing markets.

In addition, we control for the impacts of the COVID-19 pandemic on the probabilities of receiving a response from realtors and of receiving an affirmative response. We find that there are no differences in the probability of receiving responses between Japanese and foreigners before the occurrence of the COVID-19 pandemic. However, the probability of receiving an affirmative response for writing the name of a foreigner was significantly reduced even before the COVID-19 crisis, and the magnitude increased after the pandemic. The results reflect increases in the risk awareness of realtors regarding face-to-face interactions with foreign applicants and the increases in taste-based discriminatory behaviors of owners caused by COVID-19.

One of the problems in our study is that we do not control for the heterogeneity of gender and ethnicity except for examining Chinese and Korean populations due to a shortage in the sample. Ayres and Siegelman (1995) and Carlson and Eriksson (2014) find that gender has a significant impact on the services in housing markets, and gender heterogeneity may also affect the probability of receiving affirmative responses in Japanese rental housing markets. In addition, there are increases in other foreign populations beyond Chinese and Korean populations and including Vietnamese, Philippine, and American. There could be a difference in the responses of rental housing markets between using Asian and non-Asian names. Future research should increase the sample size and check the effects of the various ethnicities on discriminatory behaviors.

The Japanese government is increasing immigration to solve a labor shortage. The discriminatory behaviors shown in our study could prevent Japanese society from smoothly receiving foreign laborers. Our main contribution is to supply quantitative evidence of discrimination against foreign applicants in Japanese rental housing markets. In Japan, there has been insufficient quantitative evidence for discriminatory behaviors, so additional empirical studies are needed.

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