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**ETHNIC DISCRIMINATION IN THE RENTAL HOUSING MARKET:
AN EXPERIMENT IN NEW CALEDONIA**

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Ethnic Discrimination in the Rental Housing Market: An Experiment in New Caledonia

Mathieu BUNEL¹, Samuel GOROHOUNA², Yannick L'HORTY³, Pascale PETIT⁴, Catherine RIS⁵

Abstract

This study focuses on the links between ethnic discrimination, housing discrimination, and the ethnic composition of neighborhoods at a specific spatial level, that of the city quarter. Our goal is to determine whether discrimination exacerbates residential segregation. We measure discrimination and access to housing in Greater Nouméa, the capital of New Caledonia, by ethnic background, distinguishing between the people of Kanak (the indigenous people) and those of European descent. Between October 2015 and February 2016, four applicants individually responded to 342 real estate rental ads, made a total of 1,368 responses. Two of the applicants made their Kanak origin known through their surnames, while two others similarly made their European origin known. In each pairing, an applicant signaled financial and professional stability by explicitly indicating that he was a civil servant. A particularity of the study was to analyze this data statistically by crossing it with the ethnic distribution of neighborhoods. Severe discrimination regarding access to private rental housing for Kanak applicants in all neighborhoods was found. Signaling stability strongly reduced discrimination against Kanak applicants. This discrimination is linked to the behavior of landlords and, to a lesser extent, to the actions of real estate agencies. The difficulties accessing housing are solely due to discrimination linked to the social precariousness of Kanaks in neighborhoods where Kanaks are most represented. They are also linked to ethnic discrimination against Kanaks in neighborhoods dominated by Europeans. Housing providers thus play an active role in residential segregation.

Keywords: Discrimination; Rental Market; Field experiment; New Caledonia

JEL Classification: J15 R23 C93

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Introduction

Works on urban segregation generally pay little attention to the issue of discrimination in terms of access to housing. However, while urban segregation is often a consequence of residential choices of populations, segregation is problematic when it is an outcome of housing market discrimination. Understanding the processes of discrimination in the housing market is useful both to analyze the determinants of spatial fractures that organize the territorial separation of social groups and also to define the most relevant public policies.⁶

Discrimination in terms of access to housing has been widely studied in the United States and more recently in various European countries and beyond.⁷ All works highlight that religious or ethnic minorities are victims of differences in treatment by the real estate market. Overall, applicants from these minorities are less frequently contacted and the number and quality of properties presented to them is lower.

Research indicates that the extent of discrimination in the housing market varies according to time and place. It can depend on the characteristics of the lessor, the type of property being rented, the neighborhood where the property is located, and the integration and/or economic stability signal transmitted by the applicant. However, as of yet, little work has focused on the spatialized aspect of discrimination in terms of access to housing by studying the role, in a local context, played by the real estate market.

Is there a link between the ethnic composition of a particular neighborhood and discrimination and access to housing on the basis of origin? Do lessors in the most segregated neighborhoods welcome minority applicants? If there is a link between the ethnic composition of a neighborhood and who lessors select? How should this link be interpreted?

In the United States, the first studies undertaken that took into account the ethnic environment at a disaggregated level are those by Yinger (1986), Page (1995), and Roychoudhury et al. (1996). Since then, Ondrich et al. (2003), followed by Hanson and Santas (2014), using larger samples, have clarified the relationship between the proportion of white people in a neighborhood and the extent of discrimination. The results obtained by

⁶ Kain (1968) “*The means by which racial segregation in housing has been maintained are amply documented. They are both legal and extra-legal; for example: racial covenants; racial zoning; violence or threats of violence; preemptive purchase; various petty harassments; implicit or explicit collusion by realtors, banks, mortgage lenders and other lending agencies.*”

⁷ For the United States, see in particular publications by Yinger (1986), Choi et al. (2005), Page (1995), Choi et al. (2005), Ondrich et al. (2003), Hanson and Hawley (2011 and 2014); for Sweden, those by Ahmed et al. (2008 and 2010), Bengtsson et al. (2012), and Carlsson and Eriksson (2014); for France Bonnet et al. (2015); for Spain, the publication by Bosch et al. (2010); for Italy, the publication by Baldini and Federici (2011); for Greece, the publication by Drydakis (2011); for Belgium, publications by Heylen et al. (2015a, 2015b); for Australia, the publications by Nelson et al. (2015) and Galster et al. (2016); and for India, those by Thora et al. (2015) and Datta and Pathania (2016).

these studies seem to indicate the existence of local threshold effects in the distribution of discrimination which leads to a tipping point on the effect of neighborhood composition on discrimination. Ondrich et al. (2003) demonstrate that discrimination is lower in neighborhoods where minorities are overrepresented, and Hanson and Santas (2014) show that discrimination is most prevalent in relatively mixed neighborhoods. In a compilation, Oh and Yinger (2015) emphasize that real estate agents play a central role in the racial and ethnic steering of applicants towards neighborhoods where their ethnic group is most represented.

In Europe, this neighborhood issue was addressed by Bengtsson et al. (2012) in the Greater Stockholm Area and by Baldini and Federici (2011) in various Italian regions. In France, Acolin et al. (2016) found that there is more discrimination in areas with more immigrants. These results, which are based on highly aggregated data, show that the share of minorities in the surroundings of the offer tested increases in proportion to the extent of discrimination. However, these results remain tenuous because they do not take into account neighborhood tipping and modifiable areal unit⁸ that must be identified and controlled.

In Australia, Galster et al. (2016) assessed whether variation in discriminatory incidences across agents, home seekers, dwellings, and neighborhoods in Sydney was similar to that previously observed in the U.S. and Western European markets. They found that differences in geographic context and in the circumstances surrounding the home seekers and the dwellings sought jointly contributed to the likelihood that Anglos will receive favorable treatment from agents.

In this study, we propose to explore the relationship between discrimination and access to housing and local environment based on an experimental measure of discrimination in housing in a French territory according to community of belonging. We use a signal of stability, which makes it possible to distinguish discrimination based on information from discriminations based on preferences. Moreover, we take into account the local socio-ethnic composition at a specific level, that of the city quarter.

From October 2015 to February 2016, we conducted an access to private rental housing test in the Greater Nouméa area (the main agglomeration of New Caledonia) using a discrimination test method for two ethnic groups: Kanaks and Europeans. These communities represent respectively 26% and 33% of the population in the area studied.⁹ The high level of segregation in the Nouméa agglomeration means that it is perfectly suited for studying the link between ethnic environment and discrimination. In the southern part of this agglomeration, the share of the Kanak population is only 5%, whereas in the

⁸ The modifiable areal unit problem (MAUP) is a source of statistical bias that can alter the results of statistical hypothesis tests. When point-based measures of spatial phenomena are aggregated into districts, the resulting summary values can be influenced by both the shape and scale of the aggregation unit.

⁹ In New Caledonia as a whole, Kanaks and Europeans represent respectively 39% and 27% of the population.

northern part of the agglomeration, which is only 10 kilometers away, this proportion reaches 50%.

Moreover, as in this geographical area the two ethnic groups studied are non-minorities, it is possible to clearly distinguish two phenomena: applying for housing as an applicant from an ethnic minority and applying for housing in a neighborhood in which one's ethnic group is underrepresented.

Beyond this spatial dimension, our study protocol also identifies the origin of this discrimination by distinguishing between discrimination resulting from the preferences of the housing providers and that which stems from the social situation and stereotypes regarding tenants' ability to pay. To this end, two profiles for each community were created, i.e., those who sent a signal of financial stability and those who did not. Lastly, in line with the work by Zhao (2005), Zhao et al. (2006), Bosch et al. (2010), and Heylen and Van den Broeck (2016), our analysis clarifies the impact of real estate agents on the process of discrimination and steering of applicants.

The results show that there is strong discrimination regarding access to housing against Kanak applicants in all neighborhoods of the agglomeration of Nouméa. However, sending a stability signal greatly reduces discrimination against them. The most notable result is that the community environment where housing is being offered strongly affects the scale and especially the nature of the discrimination. In districts where Kanaks are most represented, the difficulties of access to housing are essentially linked to discrimination stemming from their social precariousness, while such difficulties are linked to ethnic discrimination against Kanaks in neighborhoods highly dominated by Europeans. Housing providers thus play an active role in residential segregation.

The structure of the article is as follows. The first section contextualizes the social environment of the Nouméa agglomeration. The second provides an overview of the literature on discrimination in terms of access to housing, focusing in particular on interactions between ethnic environments and the extent of discrimination. The third describes the method and construction of data. The fourth presents the results of testing and discusses the links between discrimination and urban segregation.

1. Segregation and the housing market in the Nouméa agglomeration

Located in the Pacific, New Caledonia is a French territory that enjoys a special status of broad autonomy, which is very different from the other French overseas communities. This island territory is characterized by severe inequalities based on ethnic background. Despite a proactive and relatively old policy aimed at promoting a more equitable distribution of resources, opportunities, and powers between communities, i.e., the so-called rebalancing (*rééquilibrage*) policy pledged in the Matignon Agreements (1988) and strengthened by the Nouméa Agreements (1998), Kanaks, the indigenous people, remain socially disadvantaged (Gorohouna and Ris., 2013). While these inequalities have tended to decline in recent years, they remain significant in many socio-economic areas.¹⁰ Table A3 in the annex provides, based on data from the 2014 census, the differences in average socio-professional status by community of membership for the chosen field in our study (men aged 25-55 from the south province). It appears that the proportion of unemployed Kanaks out of the job market is double that of Europeans and their unemployment rate is seven times higher. Among the jobs held by Kanaks, 16.9% have a fixed term contract; 70% have a permanent contract in the private sector; and 13.1% a permanent contract in the public sector. For Europeans, these percentages are respectively 9.8%, 58.7%, and 31.9%. In terms of socio-professional situations, the discrepancies are also very large, as only 14.9% of employed Kanaks hold managerial positions or are mid-level professionals, while 48.1% of Europeans fall into this category.

Beyond these inequalities, New Caledonia is also characterized by a high level of ethnic and social segregation, in particular in the Greater Nouméa agglomeration, which includes the four most populated municipalities of New Caledonia's south province: Nouméa, Mont Dore, Païta, and Dumbéa. Some 60% of the population and 73% of the jobs in the archipelago are concentrated in this area. The southern neighborhoods, predominantly European and residential where well-to-do populations are clustered, sharply contrast with the northern neighborhoods, which are predominantly Kanak, poorer, and sometimes trapped in a process of ghettoization¹¹ (Pestana et al. 2014). To measure the degree of segregation, we applied the usual Duncan and Duncan index of dissimilarity for the two groups, European and Kanak, in the urban area of Nouméa. Based on the census and by using a division of 78 neighborhoods, we obtained an index of 50.8. That means one have to change of neighborhoods more than 50% of Kanak in order to produce a distribution that matches that of the European. According to Lichter, Parisi, and de Valk (2017), in the US the estimated segregation indexes

¹⁰ According to the *Institut de statistique de New Caledonia* (New Caledonia Institute of Statistics, or ISEE), the employment rate was 49% for Kanaks and 71% for non-Kanaks; unemployment according to the census was 27% for Kanaks as opposed to 10% for other natives; 5% of Kanaks have a higher education degree, as opposed to 28% of non-Kanaks; conversely, only 3% hold managerial positions and 16% are mid-level professionals, as opposed to respectively 7% and 24% for other natives.

¹¹ This is especially the case for the Rivière Salée neighborhood.

vary substantially across metropolitan areas (13) ranging from 32.8 to 54.5. In Europe, this index ranges from 19 to 31 for four capitals.

The agglomeration's housing stock can be described using census data. In 2014, Greater Nouméa had more than 60,000 housing units. Among them, 51% were occupied by their owners, 26% by tenants of private housing, 18% by tenants of social housing, and 5% could be characterized as unplanned housing (slums). There are notable differences between the city of Nouméa and the other areas in the agglomeration. In the latter, nearly two-thirds of the population own their lodgings compared to two-fifths for Nouméa. Social housing is concentrated mainly in the neighborhoods of Nouméa and Dumbéa, where they represent 21% of the housing stock, as opposed to 8% in other areas. There are notable spatial differences in the city of Nouméa depending on the neighborhoods. The northern neighborhoods are characterized by a relatively high proportion of unsanitary housing¹² and social housing.¹³ Conversely, in the southern neighborhoods of the city, only a very small proportion of housing is social housing and rental housing is of very good quality and significantly more expensive.¹⁴

2. Discrimination regarding access to housing and the ethnic environment: an overview of the literature

The testing method most commonly used to measure both discrimination and access to housing and access to employment is also the method that is predominant in the international literature (Bertrand and Duflo 2017). In the United States, following the Fair Housing Act (1968), a great number of studies used this methodology to analyze discrimination and access to housing. A number of testing campaigns were carried out in more than 30 American agglomerations over several successive waves (1977, 1989, 2000, and 2012) under the auspices of the Department of Housing and Urban Development. Experimental evidence of discriminatory behavior against Black, Hispanic, Asian, and Native Americans minorities was found to be widely practiced (see Oh and Yinger 2015 for a recent overview of these studies). In European countries, these tests, although more recent, also exist and confirm the presence of ethnic discrimination.¹⁵ In France, Alcolin et al. (2017), after having tested 300 offers, found strong evidence of ethnic discrimination in the housing market, while Bonnet et al. (2015), from a telephone test responding to 250 real estate ads, showed that being of North African origin had no significant discriminatory effect when applicants first indicated that they lived in a deprived suburb.

¹² According to the IEOM (2008), 4.2% of the housing units of the downtown neighborhoods are unsanitary; this rate reaches 9% in the Vallée du Génie, Quartier Latin, Vallée du Tir, Nouville, and Presqu'île de Ducos neighborhoods.

¹³ The Tina sur mer neighborhood located north of Nouméa is an exception.

¹⁴ According to a 2007 study, prices per m² of apartments available for rent are 50% higher in the southern neighborhoods of Nouméa than in the rest of the agglomeration (IEOM, 2008).

¹⁵ See note 7.

Three variants of discrimination tests coexist: a test based solely on an item of correspondence (a request for information sent by e-mail); a test based on a telephone call; and a test involving the physical presence of potential tenants.¹⁶ Articles by Heckman (1998) and Heckman and Siegelman (1993) identified and discussed the limitations associated with this third method, several of which may also apply to the telephone method.

Overall, the objective of these three methods is to compare the success rates of fictitious applicants who are meant to be similar in all aspects with the exception of the characteristic tested. For each of the preceding methods, two variants may exist: the first aims to randomly select a single profile (Carpusor and Loges, 2006) for each offer tested, while the second is based on sending all profiles to the same ad (Ahmed and Hammarstedt 2008). The advantage of the first strategy is to reduce the risk of being detected, but its main disadvantage is that it does not control the effect of unobservable fixed variables on the response rate. The second strategy offers the opposite advantages and disadvantages.

The results obtained by these various studies converge to emphasize that ethnic and religious minorities are discriminated against in most of the countries and cities studied. However, these studies demonstrate, given their great heterogeneity, that differences in response rates to the same housing offer vary between 0 and 30 percentage points. This is why most recent studies attempt to characterize and explain the elements that affect these differences.

In order to identify the role played by statistical discrimination (as Arrow, 1973, did) a number of authors crossed the ethnic or religious signal with a signal suggesting a high social level (speaking in a standardized, formal manner), a high level of integration (mastery of the language), or greater employment stability (elevated professional status). Overall, regardless of its form, a signal of quality greatly reduces the extent of discrimination without completely eliminating it (Massey and Lundy, 2001; Ahmed et al. 2010; Bosch et al. 2010; Baldini and Federici 2011); Drydakis 2011).

The role played by real estate agencies is more ambiguous. According to a test conducted in Belgium by Heylen and Van den Broeck (2016) that measured the proportion of agencies agreeing to exclude applicants of foreign origin when renting housing, real estate agencies seem to be a major channel of their clients' discrimination. Previous results by Ahmed and Hammarstedt (2008) confirm this conclusion for Sweden. However, the findings of Carpusor and Loges (2006) for the city of Los Angeles, indicate that agencies do not discriminate more than private owners, while those of Bosch et al. (2010) regarding different Spanish cities demonstrate that agencies can in fact have a moderating influence in this regard. For Australia, Galster et al. (2016) investigated the relationship between discrimination and neighborhood crime and

¹⁶ Thorat et al. (2015) and Bosch et al. (2010) are among the few references to combine two approaches simultaneously. The former demonstrated that when fictitious applicants are sent by email, discrimination is stronger than when initial contact is made by telephone. The latter demonstrated that there are no differences between emailed applications and making contact by telephone.

demonstrated that rental agents in Sydney, regardless of their ethnicity, exhibited the most variation in discriminatory behaviors when the dwellings they were trying to rent were located in neighborhoods classified by differences in safety and tenure; agents were substantially more likely to favor Anglos in neighborhoods that were more desirable. They found that discriminatory behavioral patterns for Anglo and non-Anglo agents often were diametrically opposite in their responses to identical contexts.

One point that is little explored is the link between discrimination and the local ethnic environment of the housing offer. The question is whether discrimination against a given population segment can be linked to the size of this group within the local populace. This is an important question to address in order to understand the urban segregation process and its persistence over time. If the populations targeted for discrimination are a local minority, discrimination in the real estate market amplifies and maintains the phenomena of urban segregation, whereas if the populations represent a majority, the opposite is the case.

The studies do not seem to come to clear conclusions regarding the United States. Works by Yinger (1986), conducted in the city of Boston, by Page (1995), in 25 American cities, and by Roychoudhury and Goodman (1996), in Detroit, directly or indirectly examined the link between ethnic environment and the extent of discrimination. However, due to the size of their samples and/or the small differences in existing ethnic distributions in the areas studied, these studies were limited to a pair of neighborhood categories or to considerations at the level of neighborhoods.

Using larger bases (about 2,000 housing offers), Ondrich et al. (2003), Hanson and Hawley (2011), and Hanson and Santas (2014) produced more sophisticated analyses. They studied the extent of discrimination against Blacks and Hispanics based on the proportion of white people in the neighborhood of the offer in dozens of areas. They showed a nonlinear relation between these two variables that vary according to the cities considered. An agglomeration effect and a neighborhood effect coexist and remain to be characterized.

To our knowledge, in Europe, four studies integrate this dimension: Baldini and Federici (2011) in their study of different Italian regions, Bengtsson et al. (2012) in the Stockholm area, Carlsson and Eriksson (2014) in various Swedish regions, Acolin et al. (2016) in various French regions. These four studies seem to indicate that discrimination is only significant in areas with a larger concentrated share of immigrants (the northern regions of Italy for the first, the suburbs of Stockholm for the second, metropolitan areas for the third, and the Northeast, Southeast and Paris regions for the fourth). However, their results need to be confirmed because they may be sensitive to a modifiable areal unit problem or a fixed effect.

The objective of this article is to provide an in-depth study of the relationship between ethnic discrimination and ethnic segregation of a given neighborhood based on a geographically limited area characterized by major differences in ethnic distribution.

3. Experimental protocol and data collection

We conducted a test to determine access to a private housing unit for rent in Greater Nouméa. The protocol did not cover access to social housing, achieved through very specific circuits, or access to private homes, which are rare in this area. Data collection took place from October 2015 to February 2016. We tested all ads for apartments for rent in Greater Nouméa published on the reference site <http://www.immobilier.nc/> which centralizes all real estate offers in New Caledonia.¹⁷

The applicants for rental housing were men making their Kanak or European origin known through their surnames and first names. The choice of the surnames and first names correspond to credible and realistic identities. They are among the most common first names for this age group and for the community to which they belong. Surnames unambiguously indicate that a person is of Kanak or European background.¹⁸ The order of the response of each type of applicant was randomly changed daily throughout the data collection period. The test consisted of sending short and interrogative emails in response to ads published with a view to requesting a housing unit visit. The following messages were sent:

*Dear Sir or Madam:
Your ad fits the requirement that I am seeking. I would like to arrange a visit to see the apartment. What documents do you require?
Thank you,
First Name and Surname (our translation)*

These messages were deliberately short, being a first contact. Questions were asked in order to elicit a reaction from the recipient. The surname indicated the ethnicity of the applicant. A specific database was created, listing for each offer the date of publication; the

¹⁷ The internet is not the only channel through which housing offers are advertised. Other channels such as newspapers and social networks were not taken into account in this study. In addition, in the case of real estate agencies, we retained only one offer per agency.

¹⁸ For European surnames, we used names that are among the most common in metropolitan France. For Kanak surnames, we used common names that identify the person as being a member of a tribe of the south province of New Caledonia, that is to say, in the province where Greater Nouméa is located. Note that New Caledonia is a small archipelago and that Kanak family names are very characteristic and well known. The Kanak names used for our test are relatively widespread and associated with the great tribes of Grand Noumea (mainly in Mont-Dore and Païta) in the South Province. We chose two Kanak names from the Greater Noumea tribes to forestall a potential reaction from landlords who would be less inclined to rent to members from remote tribes (especially those from the Northern provinces and the Loyalty Islands). The landlords' concern would be that extended families (family in the broad sense that it may include several clans or tribes) would come regularly to stay in the future rented accommodations because return trips to and from their homes can be costly. This is an argument often used when deciding not to rent to a Kanak family. Choosing names from adjacent tribes limited this possibility because the extended family would have fewer reasons to stay with the renters, as round trips from their homes can be made in less than an hour.

geographical location; the rental price per month; the size of the unit, both in terms of the number of rooms and square meters; the gender and status of the landlord (real estate agencies or individuals) ; and finally the nature of the response provided to the applicant. Certain sprawling and sparsely populated neighborhoods of Greater Nouméa were not sampled. In the end, 31 neighborhoods were tested, sometimes with a very low number of ads (**Map 1**). In the spatial exploitation of results, a regrouping of neighborhoods into three areas was carried out (**Map 2**):

- group 1: neighborhoods in which Kanaks are a small minority (fewer than 15% of residents), located in the south of Nouméa
- group 2: mixed neighborhoods, located in Nouméa, where Kanaks represent 15% to 25% of the population
- group 3: neighborhoods comprising more than 25% of Kanaks, located in the north of Nouméa and in the areas of Païta, Dumbéa, and Mont-Dore, regardless of the percentage of Kanaks¹⁹

In total, 342 real estate ads were tested, including 118 in group 1 (34.5%), 156 in group 2 (45.6%), and 68 in group 3 (19.9%).

Potential differences in the spatial treatment of applicants may come from statistical discrimination or discrimination based on preferences. In order to identify these two sources of discrimination, as was done by Massey and Lundy (2001), Ahmed et al. (2010), Bosh et al. (2010), Baldini and Federici (2011), and Drydakis (2011), Galster et al. (2016), we crossed the ethnicity signal with a signal concerning the financial and professional stability of the applicant.

The following sentence was added to certain messages sent by our fictitious applicants: “*I am a civil servant and I have just moved to Nouméa.*” This unambiguously signaled employment stability and on average a higher salary, given the indexation policy that exists in this area.²⁰

As such, four rental applicant profiles were created (A-European, B-European civil servant, C-Kanak, D-Kanak civil servant). In the end, our base contained 1,368 responses to 342 real estate ads (4×342).

We chose to send the four messages in response to each ad to ensure that each of the fictitious individuals was confronted with the same characteristics of the agents (observable and unobservable). In this way, we could compare their chances of success for the same providers. If

¹⁹ Ethnic disparities by neighborhood in the areas of Païta, Dumbéa, and Mont-Dore, disparities that also exist but in a markedly less pronounced manner than in Nouméa, could not be taken into account because the housing offers in these areas were too low.

²⁰ The salaries of civil servants in the area considered are multiplied by 1.73 compared to the French metropolitan grid. According to ISEE data, in New Caledonia, civil servants have higher incomes on average than people working in the private sector.

we randomly sent a single fictitious individual's response to each announcement, we would not be able to ensure that each candidate was confronted on average with the same characteristics of the landlords as the other three individuals, given the restricted size of testing samples.

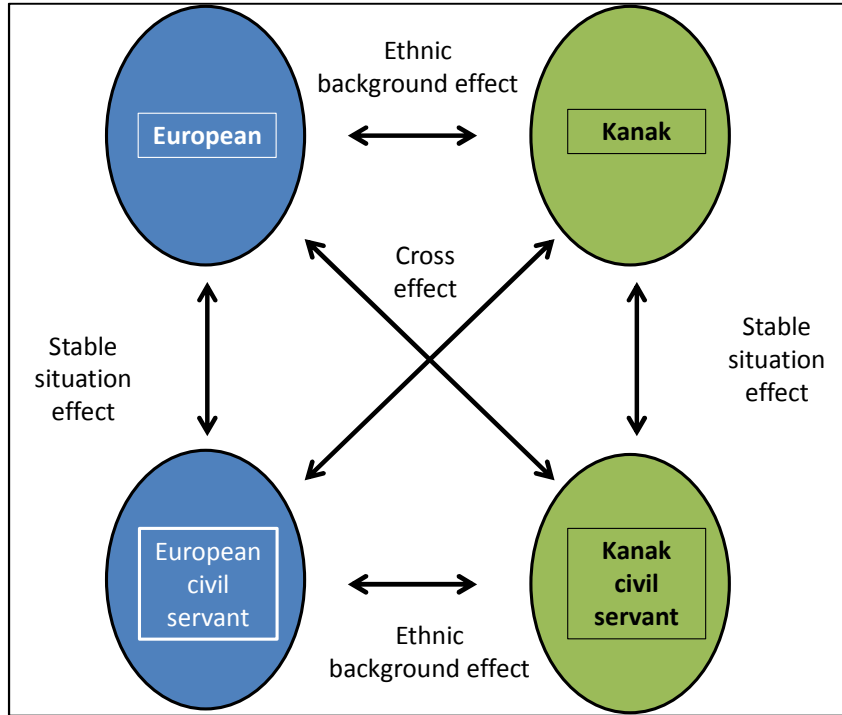
Notice that this perfect control for all the characteristics of the landlords has as a counterpart which is a higher risk of detection, which had to be considered. We believe that we minimized this risk, as well as its possible impact, in the following way. First, we only responded to ads uploaded three days before and, in most cases uploaded on the same day. The most recent ads were the ones that received the most responses, all other things being equal. We therefore made the reasonable assumption that other applicants' requests would be interspersed between our four messages, especially since we allowed at least one hour to elapse between the two messages addressed to the same ad. Furthermore, the messages were not "identical" but "similar," that is to say in terms of substance and form they resembled each other, but notable elements of differentiation in terms of formulation were introduced. We also noted that the websites to which we responded to the ads encouraged interested people to contact the offeror through that channel to ask for additional information or to request a visit to the apartment. In other words, it is common for landlords to receive this type of solicitation when they are posting a rental announcement online.

However, there was a concern that these precautions might not totally avoid the risk of detection. It was then necessary to examine what the reactions of a potential landlord would be in case of detection. Since discrimination is punishable, the landlords who realizes that they are being tested have an interest in not discriminating, i.e., not responding to any of the four solicitations or, in contrast, to respond in a similar manner to the four solicitations. Keep in mind that the order in which the four messages were sent to the same ad was random. Overall, none of the four fictitious individuals could therefore be penalized more than the others when the landlords finally realized their mistake. Assuming that some providers detected our test, we would have to minimize the extent of discrimination in our data. This amounted to providing a low range of extent of discrimination. However, even under this hypothesis, we nonetheless showed significant discrimination. Overall high response rates and the fact that 45% of landlords responded positively to all four ads might suggest no detection at all.

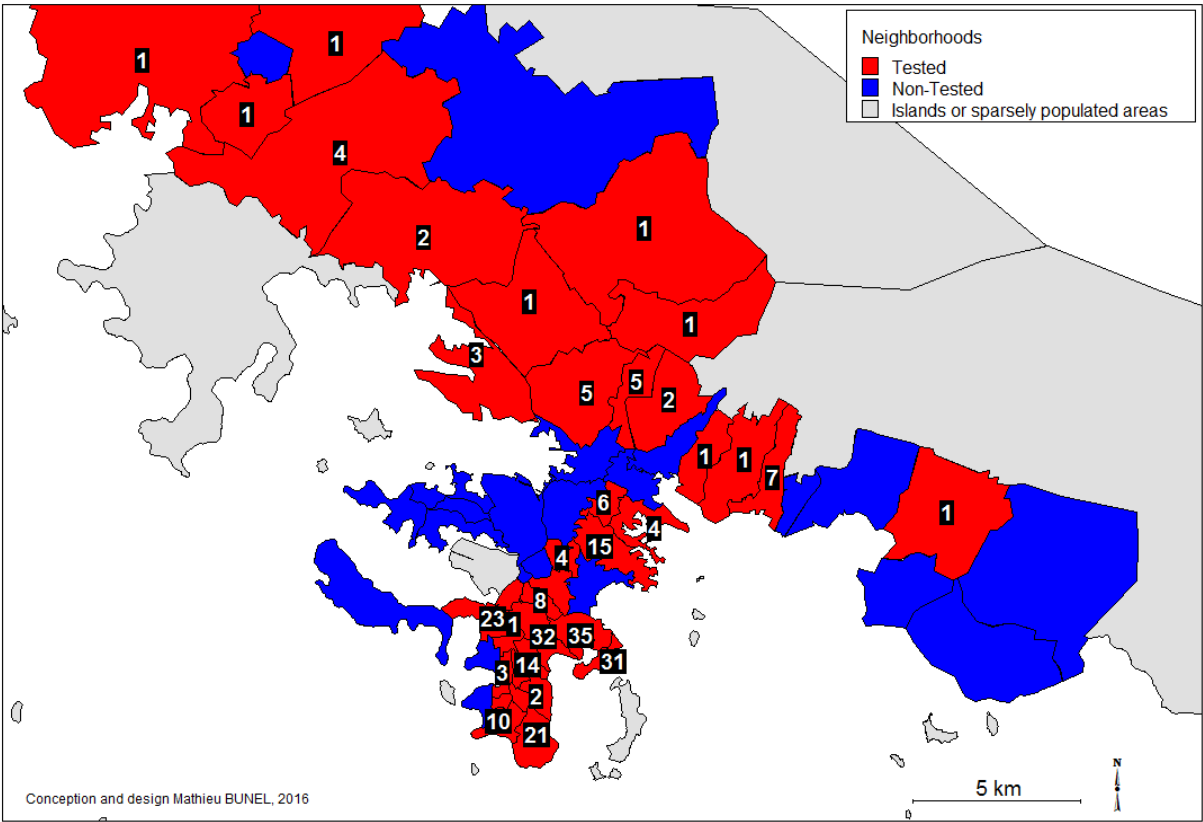
By comparing the results obtained for each of these profiles, our protocol evaluated the effect of ethnic background, the employment stability conditional, the effect of stability conditional on ethnic background, as well as cross effects, which combined the two aspects (diagram 1).

Finally, we noted that among the ads tested 87% were published by individuals and 13% by real estate agencies. Testing ads placed both by individuals and by real estate agencies enabled us to determine whether potential discrimination was linked to the personal preferences of the real estate agents and lessors and/or the characteristics of the neighborhoods or even whether the agencies played an active role in steering applicants, all hypotheses that are widely discussed in the literature (Choi et al. 2005; Oh and Yinger 2015).

Diagram 1. Evaluated effects



Map 1: Location and number of housing offers tested in Greater Nouméa



4. Test results

Of the 342 ads tested, 274 obtained at least one answer and in 258 cases these responses were positive. The response rate, calculated by dividing the number of positive responses by the total number of ads, exceeded 75%²¹ (Table 1).

Table 1. Distribution of the number of positive responses by offer

Number of positive responses by offer	Number of cases	%
None	84	24.6%
1 and more	258	75.4%
Number of applicants contacted in the event of a positive response		
1	22	8.5%
2	36	14.0%
3	45	17.4%
4	155	60.1%

Source: DALTON database

We will first present the aggregated results for all of Greater Nouméa before presenting the results by neighborhood groups.

Aggregated results

The applicant who was most frequently contacted by lessors was the European applicant who signaled stability by mentioning that he was a civil servant (Table 2). He was contacted 67.5% of the time in response to his requests. Next was the European applicant who did not signal stability (65.2%), followed by the Kanak civil servant applicant (63.5%), and finally the Kanak applicant who did not signal stability (52.0%). The latter was systematically the least often contacted, regardless of the total number of responses by the lessor. Based on these results, the European applicant who signaled stability sent out 14.8 applications to receive 10 positive responses, while the Kanak applicant who did not signal stability sent 19.2 applications.

²¹ The response rates per applicant were slightly higher in our study than in those conducted in the United States (Carlsson and Eriksson 2014), in Italy (Baldini and Federici 2011), in Sweden (Ahmed et al. 2010), in Spain (Bosch et al. 2010), or in Australia (Galster et al. 2016), which vary between 40% and 70%.

Table 2. Non-null response rates by type of applicant

Type of applicant	Non-null response rate		Response rate as a condition of the total number of responses							
			1		2		3		At least 1	
	N	%	N	%	N	%	N	%	N	%
European civil servant	231	67.5%	13	52.0%	24	66.7%	39	86.7%	231	89.5%
European	223	65.2%	3	12.0%	26	72.2%	39	86.7%	223	86.4%
Kanak civil servant	217	63.5%	5	20.0%	17	47.2%	40	88.9%	217	84.1%
Kanak	178	52.0%	1	4.0%	5	13.9%	17	37.8%	178	69.0%
Number of offers	342		25		36		45		258	

Source: DALTON database

When comparing applicants with different statuses, discrepancies between the two European applicants were statistically insignificant, indicating that the stability signal of being a civil servant is not valued by lessors for a European applicant (Table 3 and Table 4). On the other hand, the difference between the two Kanak applicants was significant, indicating this time that the stability signal of being a civil servant is highly valued by a lessor when it comes to a Kanak applicant (an 11 point difference in this respect).

As a result of the bonus access, the status of the Kanak civil servant did not differ significantly from that of the two European applicants, at a threshold of 5%. On the other hand, the difference between the European applicants and Kanaks of the same status, who either identified as civil servants or were without apparent status, was significant (10% for civil servant applicants alone). These results suggest the coexistence of two sources of discrimination: information discrimination, or statistical discrimination, vis-à-vis the Kanak applicant who did not signal stability, as evidenced by the differences between the Europeans and the Kanaks, which dwindled sharply when the latter signaled employment stability, such as being a civil servant and discrimination based on preferences, of a lesser magnitude, revealed by the fact that significant differences existed between the European and Kanak civil servants (a discrepancy of 4 percentage points).

Thus, a Kanak who does not signal stability is the victim of double discrimination, being targeted for his or her ethnic background and because of real or presumed social precariousness. Taken together, the two elements result in a penalty of about 15 percentage points in the response rate upon initial contact with the lessor. Compared to the applicant of European origin, this corresponds in relative value to a total discrepancy of nearly 30%, a very considerable figure indeed.

Table 3. Gross rate of non-null responses for the same advertisements (in %)

Type of applicant	Non-null response rate	Standard deviation	Student T	Confidence interval of 90%	
				Lower limit	Upper limit
European civil servant	67.5***	2.53	26.72	63.3	71.7
European	65.2***	2.58	25.27	61.0	69.4
Kanak civil servant	63.5***	2.57	24.65	59.2	67.7
Kanak	52.1***	2.66	19.55	47.7	56.4

Student statistics and confidence intervals calculated using the bootstrap method based on 10,000 replicates

**** Significant at a threshold of 1%*

Source: DALTON database

Table 4. Differences in the success rates of fictitious applicants for the same offers according to the applicant's work situation and background (in % points)

2 on 2 comparisons for the same offers	Deviation (in % points)	Student	Confidence interval of 90%	
			Lower limit	Upper limit
Effect of stability signal (reference applicant: no stability signal)				
All	6.9***	5.04	4.7	9.1
Europeans	2.4	1.21	0.84	5.54
Kanak	11.4***	5.52	8.01	14.78
Ethnic background signal effect (European reference applicant)				
All	-8.6***	-5.00	-11.4	-5.8
Employment stability signal	-4.1*	-1.85	-7.71	-0.46
No stability signal	-13.2***	-5.75	-16.95	-9.42
Cross effect (European reference applicant with stable employment)				
Kanak whose work situation was not disclosed	-15.51***	-6.55	-19.39	-11.62

Student statistics and confidence intervals calculated using the bootstrap method based on 10,000 replicates

**** Significant at the 1%, ** 5%, * 10% threshold*

Source: DALTON database

Table 5 Presents the detailed results of the tests and distinguishes between them according to the origin of the offers, whether they came from an individual or a real estate agency. Similar to Choi et al. (2005), Ahmed and Hammarstedt (2008), Bosch et al. (2010), and Heylen and Van den Broeck (2015), and contrary to Carpusor and Loges (2006), there are differences between private owners and agencies. Agencies respond more often to all applicants and discriminate less often (Table 5).²² Discrimination against Kanaks is more pronounced with an individual than a professional landlord (-4.7 vs.-1.5 and -14.1 vs. -9.0).

This is an interesting result because it invalidates the hypothesis that housing discrimination is essentially driven by the preferences of real estate agents. While we found real estate agents to be involved in the process of discrimination as regards such access, we are not in a position to determine whether they acted based on their own preferences or if they responded to requests expressed more or less explicitly by those whom they represented. Given the size of our sample, we were unable to explore this link any further.

²² We also tested whether the gender of the lessor influences the response rate and level of discrimination. As with Ahmed et al. 2008, this dimension did not significantly affect the results.

Table 5. Differences in the success rates of fictitious applicants for the same offers according to the applicant's work situation and background based on the status of the offerer (in % points)

2 on 2 comparisons for the same offers	Deviation (in % points)	Student	Confidence interval of 90%	
			Lower limit	Upper limit
Offers by agencies				
Stability signal effect (reference applicant: no stability signal)				
All	6.1	1.31	1.5	13.7
Europeans	3.1	0.83	3.0	9.1
Kanak	10.5**	2.01	1.9	19.1
Ethnic background signal effect (European reference applicant)				
All	-5.3	-1.18	-12.6	2.0
Employment stability signal	-1.5	-0.31	-9.7	6.6
No stability signal	-9.0†	-1.62	-18.1	0.1
Cross effect (European reference applicant with stable employment)				
Kanak whose work situation was not disclosed	-12.0**	-2.07	-21.5	-2.5
Offers by individuals				
Stability signal effect (reference applicants: no stability signal)				
All	4.5***	2.56	1.6	7.4
Europeans	2.2	0.97	1.5	5.9
Kanak	11.6***	5.22	8	15.2
Ethnic background signal effect (European reference applicant)				
All	-9.4***	-5.09	-12.5	-6.4
Employment stability signal	-4.7*	-1.89	-8.8	-0.6
No stability signal	-14.1***	-5.61	-18.3	-10.0
Cross effect (European reference applicant with stable employment)				
Kanak whose work situation was not disclosed	-16.3***	-6.24	-20.5	-12.0

Student statistics and confidence intervals calculated using the bootstrap method based on 10,000 replicates

*** Significant at the 1%, ** 5%, * 10% threshold †The p-value is 0.1023

Source: DALTON database

Disaggregated results by group of neighborhoods

The high level of ethnic segregation in the Nouméa agglomeration makes it possible to identify the effect of socio-ethnic concentration of neighborhoods on the extent and nature of discrimination in the same area. Tables 6 and 7 present the results obtained for the three types of neighborhoods we selected: strongly segregated (group 1), segregated (group 2), slightly segregated (group 3).

The results obtained point to two elements: on one hand, there are fairly clear differences in treatment depending on the type of neighborhood and, on the other, this discrimination stems from different sources depending on the neighborhood. More specifically, we believe that statistical discrimination and discrimination based on preferences can be attributed differentially between neighborhoods.

In neighborhoods with the highest Kanak concentration, housing providers strongly value the stability signal from Kanak applicants who indicate that they are civil servants. The probability of being called back increases by 20.7 percentage points. Aside from this aspect, there are no statistically significant differences related to the ethnic community that housing-seekers belong to. The difficulties that Kanaks experience in accessing housing in these neighborhoods, which are very real, constitute statistical discrimination related to social and employment instability, perceived as excessive by providers.

In intermediate neighborhoods, we found evidence of statistical discrimination against Kanaks: an employment stability signal significantly increases their chances of accessing housing (by nine points). There is also evidence of ethnic discrimination in the narrow sense of the term: compared with European applicants, a Kanak's chances of obtaining housing drops by 11.6 points if they exhibit no sign of stability and by 5.8 points if they indicate that they are employed in the civil service.

Ethnic discrimination is most evident in neighborhoods with the fewest Kanak residents, i.e., below 15%. Their chances compared to those of Europeans are reduced by 17.4 points if they show no signs of financial stability and by 6.7 points in the case of civil servants. In addition, there are similar levels of statistical discrimination in the southern neighborhoods of Nouméa. A stability signal increases a Kanak's chances in these areas by 11.6 points, similar to the neighborhoods mentioned above.

Table 6. Raw rate of non-null responses to the same advertisements (in %)

Type of applicant	Rate of non-null responses	Standard deviation	Student T	Confidence interval of 90%	
				Lower limit	Upper limit
Neighborhoods with under 15% Kanak residents (group 1)					
European civil servant	68.6***	4.31	15.93	61.5	75.7
European non civil servant	69.5***	4.28	16.25	62.5	76.5
Kanak civil servant	63.5***	4.41	14.41	56.3	70.8
Kanak non civil servant	51.6***	4.66	11.09	44.0	59.3
Neighborhoods with 15% to 25% Kanak residents in Nouméa (group 2)					
European civil servant	68.6***	3.76	18.26	62.4	74.8
European non civil servant	65.4***	3.76	17.37	59.2	71.6
Kanak civil servant	62.8***	3.89	16.17	56.4	69.2
Kanak non civil servant	53.8***	4.00	13.45	47.2	60.3
Neighborhoods with over 25% Kanak residents in and outside Nouméa (group 3)					
European civil servant	63.2***	5.9	10.8	53.5	72.8
European non civil servant	57.4***	5.9	9.7	47.6	67.1
Kanak civil servant	64.7***	5.8	11.2	55.1	74.2
Kanak non civil servant	48.4***	6.1	7.9	38.4	58.5

Student statistics and confidence intervals calculated using the bootstrap method based on 10,000 replicates

**** Significant at the threshold of 1%, ** of 5%, * of 10%*

Remark: The % of Kanaks per neighborhood is drawn from Pestana et al. (2015) using 2009 ISEE census data

Source: DALTON database

Table 7. Differences in the success rate of fictitious applicants responding to the same advertisements according to their work situation and background based on the ethnic environment of the housing location (in percentage points)

2 on 2 comparisons for the same offers	Deviation (in % points)	Student	Confidence interval of 90%	
			Lower limit	Upper limit
Neighborhoods with under 15% Kanak residents (group 1)				
Stability signal effect (reference applicant: no stability signal)				
All	2.9	1.16	-1.2	7.0
European	0.9	0.24	-5.0	6.7
Kanak	11.6***	3.50	6.2	17.1
Ethnic background signal effect (European reference applicant)				
All	-12.0***	-4.32	-16.5	-7.4
Employment stability signal	-6.7*	-1.72	-13.1	-0.3
No stability signal	-17.4***	-4.53	-23.6	-11.1
Cross effect (European reference applicant with stable employment)				
Kanak whose work situation was not disclosed	-18.2***	-4.31	-25.1	-11.3
Neighborhoods with 15% to 25% Kanak residents in Nouméa (group 2)				
Stability signal effect (reference applicant: no stability signal)				
All	3.2	1.28	0.9	7.3
European	3.2	1.29	0.9	7.2
Kanak	9.0***	2.80	3.7	14.3
Ethnic background signal effect (European reference applicant)				
All	-8.7***	-3.42	-12.8	-4.5
Employment stability signal	-5.8*	-1.89	-10.8	-0.8
No stability signal	-11.6***	-3.34	-17.2	-5.9
Cross effect (European reference applicant with stable employment)				
Kanak whose work situation was not disclosed	-14.7***	-4.23	-20.5	-9.0
Neighborhoods with over 25% Kanak residents in and outside Nouméa (group 3)				
Stability signal effect (reference applicant: no stability signal)				
All	17.2***	2.21	4.5	30.0
European	6.7	1.00	-4.3	17.8
Kanak	20.7***	2.78	8.5	32.9
Ethnic background signal effect (European reference applicant)				
All	0.0	0.00	-10.6	10.6
Employment stability signal	7.0	0.83	-6.8	20.7
No stability signal	-6.9	-1.01	-18.0	4.3
Cross effect (European reference applicant with stable employment)				
Kanak whose work situation was not disclosed	-13.7*	-1.69	-27.0	-0.4

Student statistics and confidence intervals calculated using the bootstrap method based on 10,000 replicates

*** Significant at the threshold of 1%, ** of 5%, * of 10%

Remark: The % of Kanaks per neighborhood is drawn from Pestana et al. (2015) using 2009 ISEE census data

Source: DALTON database

Econometric confirmation

Finally, Tables 8 and 9 present the results obtained using a random effects Probit model. This model estimates the probability of obtaining a positive response conditional on observed characteristics of offers by assuming that part of the variance of the error term is common to all tested offers.

The 0 model estimates the model without a characterization variable for offers. It confirms the existence of two sources of discrimination: income, with an estimated absence of stability signal (NON-STABLE) and ethnic background (KANAK) and the cross effect of NON-STABLE x Kanak obtained in previous tables. This effect exceeds in absolute value the stability effect, which indicates the coexistence of two sources of discrimination, based on preference and on information.

Model 1 adds a large number of control variables related to neighborhood of residence, apartment size, the gender of the lessor, and the nature of the lessor (individual or agency). The coefficients of the variables of interest hardly change in response to the addition of these numerous controls, thereby confirming the coexistence of two difficulties faced by Kanaks in matters of access to housing: the absence of stable income, on the one hand, and ethnic discrimination on the other.

It should be noted that for models 0 and 1, the intra-class correlation is very important, i.e., 0.86, meaning that 86% of the variance of the probability of any of the four fictitious applicants being contacted by the lessor was due to the behavior of the landlords.

The computation of the marginal effects associated with the employment stability signal effect and the ethnic signal effect obtained using model 2 confirms the aforementioned results (Table 9). In addition, when estimating these effects in relation to the three categories of neighborhoods, we obtain a non-significant effect for the ethnic signal in mixed neighborhoods (the coefficient of which is twice or three times lower), whereas in the two highly segregated neighborhoods it is significant and very negative. By contrast, the stability signal's importance in mixed neighborhoods is two-fold compared with segregated neighborhoods. In these areas, where rent cost is lower, landlords must expect a lesser degree of self-selection among tenants and accept a greater risk of default of payment on their part. This is why they are more sensitive to the financial stability signal.

Table 8. Random effects Probit model

	Model 0		Model 1	
	Coef.	std.	Coef.	std.
<i>Location of the offer</i>				
Absence of stability signal (non-stable)	-0.575**	0.289	-0.574***	0.289
Kanak	-0.332	0.289	-0.331	0.289
Non-stable × Kanak	-1.157***	0.408	-1.156***	0.407
<i>Characteristics of the offer</i>				
<u><i>Ethnic environment of the housing location</i></u>				
Less than 15% (group 1)			-0.250	0.701
Between 15% and 25% in Nouméa (group 2)			Ref.	
Over 25% and outside Nouméa (group 3)			-0.169	0.822
<u><i>Size of apartments (ref : F2-LOFT)</i></u>				
F1			-0.331	0.924
F3			1.393*	0.764
F4-F5			1.723*	0.990
<u><i>Characteristics of the lessor</i></u>				
Woman			0.921	0.619
<u><i>Type of lessor (ref : Agency)</i></u>				
Individuals			-0.596	0.805
<u><i>Price per m²</i></u>				
Relation between the price per m ² and the average price in this neighborhood			-0.013	0.010
<u><i>Game A</i></u>				
Constant	2.272***	0.389	3.331***	1.768
Sigma	4.828***	0.484	4.628***	0.470
Akaike information criterion	1,217.0		1,217.2	
Log-likelihood	-603.5		-594.6	
Pseudo-R2	4.8%		6.2%	

***Significant at the 1%, ** 5%, * 10% threshold

Source: DALTON database

Table 9. Marginal effects from Model 1 for all neighborhoods and by neighborhood sector

Type of neighborhoods	Marginal effect	Standard deviation	p-value	N	Akaike criterion
All tested neighborhoods					
Ethnic background signal (being Kanak)	-0.086***	0.016	0.000	1,368	1,213.3
Stability signal (being a civil servant)	0.069***	0.015	0.000		
Neighborhoods with under 15% Kanak residents (group 1)					
Ethnic background signal (being Kanak)	-0.114***	0.027	0.000	472	427.8
Stability signal (being a civil servant)	0.054**	0.025	0.033		
Neighborhoods with 15% to 25% Kanak residents in Nouméa (group 2)					
Ethnic background signal (being Kanak)	-0.087***	0.023	0.000	624	551.0
Stability signal (being a civil servant)	0.061***	0.022	0.006		
Neighborhoods with over 25% Kanak residents in and outside Nouméa (group 3)					
Ethnic background signal (being Kanak)	-0.038	0.034	0.264	272	262.8
Stability signal (being a civil servant)	0.108***	0.036	0.003		

*** Significant at the 1%, ** 5%, * 10% threshold

Source: DALTON database

Conclusions

This study draws upon the results of a discrimination test regarding access to private sector rental accommodation carried out between October 2015 and February 2016 in the Greater Nouméa area. The testing consisted of sending out responses to 342 ads on behalf of four applicants, i.e., 1,368 responses to real estate advertisements.

The objective of this test was to measure discrimination based on ethnic background by comparing the responses given to Kanak and to European rental housing-seekers. We added a financial stability signal indicating explicitly that the rental applicant was a civil servant in order to distinguish between discrimination based on background or ethnicity (preferences) and statistical discrimination (information). The latter may be associated with social precariousness which, as of June 2016, has become the 21st legally prohibited ground for discrimination in French legislation.

We found that Kanak applicants are doubly penalized, first as a result of their less favorable, real or assumed, professional and financial situations, and, secondly, because of the ethnic preferences of the housing lessors. The latter are more marked when providers are individuals as opposed to real estate agencies.

The originality of this paper consists of underscoring the fact that discrimination on ethnic grounds varies depending on the neighborhood. In neighborhoods with a significant number of Kanak residents, social precariousness is the main obstacle to accessing housing for members of this ethnic community. However, a stable financial and occupational status increases the chances of finding rental housing for a Kanak applicant. The stability signal is an advantage in other neighborhoods, but to a lesser extent. Ethnic discrimination is concentrated in a smaller space: this is mostly in neighborhoods with the weakest representation of Kanaks and, to a lesser degree, in intermediate neighborhoods. Such discrimination is not statistically significant in areas with the highest number of Kanak residents.

These results suggest that discrimination regarding access to housing plays an active role in residential segregation in the Nouméa metropolitan area. Population distribution in the city depends both on residents' choices and provider, or real estate agency, offers. We have excluded residents' choice from the scope of this study, but we observe that provider offers play an active role in residential segregation in Nouméa.

The main limitation of this study is that its scope does not extend beyond the first step to finding housing, i.e., obtaining an appointment with the lessor. However, our findings are sufficiently robust to warrant a call for policy action. Whereas social diversity in neighborhoods is a stated government objective in France and in New Caledonia and despite the strict prohibition of discrimination on ethnic grounds, the finding that strong discrimination of this kind exists regarding access to housing in New Caledonia touches on important public policy issues. This study's findings are an invitation to serious reflection regarding the regulation of the real estate

market and the means that may be implemented in order to counter housing discrimination. Public policy tools range from legislation to concrete measures aimed at giving teeth to the law. Actions to combat social precariousness, in particular through access to subsidized housing or financial security mechanisms aimed at providing guarantees to private lessors, should find a prominent place among these measures.

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Annex 1

Table A1: Summary of principal works on discrimination in the housing market, where ethnic composition of the neighborhood is directly or indirectly insinuated

Authors	Method Output	Location	Weight of minority in total population (1)	Estimated effect
United States				
Yinger (1986) AER	Audit Number of homes presented to Black/White applicants	United States Boston 312 offers in 1981	25%	Discrimination against Blacks and Hispanics is very significant in neighborhoods dominated by Whites (-30%). It is practically absent in less segregated neighborhoods.
Pager (1995) JUE	Audit Number of homes presented to a Hispanic and Black applicant	United States 25 American cities 3,500 offers for rentals and for sales in the first half of 1989	At least 12% Black and 7% or more Hispanic Analysis of a threshold effect with a neighborhood concentration of at least 20% Black or Hispanic	Discrimination varies between -10% and -30% depending on the area. The ethnic environment significantly affects discrimination for sales but not for rentals.
Roychoudhury and Goodman (1996) REE	Audit Black/White applicant	United States Detroit 319 tests from 1980 to 1990	Two types of neighborhoods, one 60% or more Black and one less than 60% Black (on average, 80% of Detroit's population is Black)	Discrimination is lower by black real estate agents and in neighborhoods with a higher proportion of Blacks.
Ondrich et al. (2003) RES	Audit Black/White applicant Hispanic/White applicant	United States 25 American cities 2,465 offers for rentals and for sales from May to August 1989	At least 12% Black and 7% or more Hispanic	Discrimination is lower for properties located in areas where Blacks are over-represented.
Carpusor and Loges (2006) JASP	Random testing using -name -email Afro-American / Arab /white	United States Los Angeles 1,100 offers in March 2003	9.8% Afro Americans, 0.7% Arab, 48.7% white	Deviation of 23 (Arabs) and 33 percentage points (Blacks) in responses. No analysis on the effect of the ethnic environment.
Hanson and Santas (2014) SEJ	Testing Matching Assimilated Hispanics and less assimilated immigrants (level of English)	United States 21 American cities 3,072 offers	Cities between 3% and 44% Hispanic	5-point deviation in the southwest and not significant elsewhere. Not directly related to the % of Hispanics in the area.
Hanson and Hawley (2011 and 2014) JUE and RSUE	Testing Matching Africans using their name	United States Atlanta, Boston, Chicago, Dallas, Washington, D.C, Houston, Los Angeles, New York, Seattle, and San Francisco local July to October 2009 2,010 offers tested	Variation from 0% to 100% depending on the neighborhood	Deviation of 5 percentage points. Stronger discrimination in mixed neighborhoods.
Ewens et al. (2014) RES	Random testing using Africans using their name	United States 34 cities 14,237 offers tested	Variation from 0% to 100% depending on the neighborhood	Deviation of 5 percentage points. Lack of linear relation between % of Blacks in the area and racial discrimination.

Authors	Method Output	Location	Weight of minority in total population (1)	Estimated effect
Europe				
Acolin, Bostic, and Painter (2016) JUE	Testing using name and e-mail, through the leading internet platform, 6 applicants French, Northern Africa, Sub-Saharan Africa, Southern European (Portugal-Spain), Eastern European (Poland) and Turkey	France, April to May 2014 300 offers leading to 1800 observations	Share of immigrants or second generations ranges from 8,4 % in the Northwest to 35,4% in Paris Region.	Applicants with foreign sounding names are 16 to 22 percentage points below applicants with French names. The level of discrimination is largest in Northeast France, Southeast France, and in Paris and its high-income western suburbs.
Bonnet, Lalé, Safi, and Wasmer (2015)	Testing by telephone 4 applicants combining two names (French vs North African origin) and two locations (rich suburbs vs deprived neighborhood).	France, March to April 2009 250 offers	The percentage of immigrants from North Africa is 5.2% in the Paris region.	North African origin has no significant discriminatory effect when applicants first indicate living in a deprived suburb.
Ahmed and Hammarstedt (2008) JUE	Testing using name Matching using email 3 applicants: Swedish man Swedish woman Arab/Muslim man	Sweden 500 in February to March 2007	Percentage of Arab or Muslim foreigners in the population as a whole $12\% \times 14\% = 1.7\%$	Scale of discrimination varies between 25-35 percentage points. No analysis on the effect of the ethnic environment.
Bengtsson et al. (2012) AEL	Testing using email Swedish man Swedish woman Arab/Muslim man	Sweden Greater Stockholm area 1,213 observations between March and May 2010	18% immigrants in downtown area versus 25% in the suburbs and other cities of the Greater Stockholm area	Deviation of 6 percentage points for women and no difference for men. Non-significant effect in downtown area where proportion of immigrants is smaller.
Carlsson and Eriksson (2014) JHE	Random testing Swedish man Swedish woman Muslim man Muslim woman	Sweden 5827 rental offers from October 2010 to March 2011	10% EU foreigners and 10% foreigners from outside of the EU	Discrimination varies between 14 to 10 percentage points. Discrimination is stronger against Muslims outside of Stockholm.
Baldini and Federici (2011) JHE	Random testing Men/women/Muslim or from Eastern Europe Positive signal for the person	Italy 41 Italian cities 3,676 offers in March and July 2010	9.5% of total residents in northern regions, 9% in the center and only 2.6% in the south	20-point deviation Significant effect only in northern regions where foreigners are over-represented.
Drydakakis (2011) JPE	Testing by telephone Albanian woman and Greek woman Name and pronunciation of words	Greece Athens 122 neighborhoods 4,351 offers in November 2006 and October 2007	4% for all of Greece	Deviation between 25% and 46%. Discrimination is stronger in wealthier neighborhoods.
Bosch, Carnero and Farré (2010) RSUE	Testing by email Matching in pairs Moroccan and Spanish applicant Quality of applicant	Spain's 20 biggest cities 1,809 rental offers between January and March 2009	1.5% Moroccan emigrants	Deviation of 10 percentage points. Larger deviation for men than for women. No analysis on the effect.

	indicated by their profession			of the ethnic environment.
Heylen, Van den Broeck (2016) HS	Testing by email Matching and by telephone contact Moroccan and Turkish	Belgium 1,769 (e-mail)+ 684 (telephone) offers	11% Moroccan and Turkish foreigners representing 7% and 3% of the foreign population	Positive effect for email applications but not for telephone applications. No analysis on the effect of the ethnic environment.
Heylen, Van den Broeck (2015) EJJH	Telephone contact test Unemployed individuals and foreigners	Belgium 900 real estate agencies are tested June 2013	8.5% unemployed population and 11% foreigners	41% claim being able to avoid foreigners and 60% say the same for unemployed individuals. No analysis on the effect of the ethnic environment.
Others				
Nelson <i>et al.</i> (2015) Galster <i>et al.</i> (2016) UAR	Audit matching in pairs Anglo – Indian – Muslim/ Middle-eastern	Australia 369 to 537 offers in the greater Sydney area between August and November 2013	2% Indians and 4.4% Muslims	Significant differences in the information transmitted. The effect of the ethnic environment is pooled with others variables.
Datta and Pathania (2016)	Random testing– Using name Email Hindu vs. Muslim	Delhi India 171 rental offers in the summer of 2015	13% Muslims	-12% penalty against Muslims. No analysis on the effect of the ethnic environment.

(1) Data in article or census data

Table A2. Characteristics of neighborhood groups

	% of housing in Greater Nouméa	% of the population in Greater Nouméa	% owners (2014)	% social housing (2014)	% private rental housing (2014)	% of Kanak (2009)
Neighborhoods less than 15% Kanak (group 1)	35%	29%	49%	13%	38%	10%
Neighborhoods 15% to 25% Kanak in Nouméa (group 2)	12%	11%	43%	35%	21%	25%
Neighborhoods more than 25% Kanak in Nouméa and outside of Nouméa (group 3)	53%	60%	62%	22%	15%	30%

Note: These statistics include all neighborhoods of the Greater Nouméa agglomeration, whether tested or not.

Sources: 2014 census data (ISEE), Pestana *et al.* (2014)

Table A3: Characteristics of offers

	In % of offers	Positive response rate Per offer
Characteristics of the offer and the company		
<u>Size of apartments</u>		
F1	15.5%	66.0%
F2-LOFT	38.6%	74.2%
F3	30.1%	81.6%
F4-F5	15.8%	75.9%
<u>Characteristics of lessor</u>		
Woman	49.2%	78.9%
<u>Type of lessor</u>		
Agencies	19.3%	83.3%
Individuals	80.7%	73.6%
<u>Location of offers</u>		
Less than 15% (group 1)	34.5%	76.3%
Between 15% and 25% in Nouméa (group 2)	45.6%	74.4%
More than 25% and outside of Nouméa (group 3)	19.9%	76.5%
<u>Average price per m²</u>		
CFP franc average (standard deviation)	2,165.2 (549.7)	-
<u>Type of game</u>		
A	55.9%	75.9%
B	44.2%	74.8%
TOTAL	100%	75.4%
Number of observations	342	

Source: DALTON database

Table A4: Status and work situation of men of Kanak or European backgrounds living in the south province

		2009				2014			
		All	Kanak (1)	Euro (2)	Deviation (1)-(2)	All	Kanak (1)	Euro (2)	Deviation (1)-(2)
Ethnic background									
	Euro	40.9				37.9			
	Kanak	24.0				24.5			
	Other	35.1				37.5			
Work situation									
	Inactive	7.8	11.9	5.5	6.5***	6.4	9.6	3.9	5.8***
For active individuals									
	Unemployed individuals*	5.2	13.1	1.8	11.3***	7.1	15.9	2.7	13.3***
	Salaried workers	79.8	82.3	76.1	6.2***	74.7	77.5	71.2	6.3***
	Independent workers	15.0	4.6	22.1	-17.5***	18.2	6.6	26.1	-19.6***
For salaried workers									
	Fixed term contract	12.9	16.9	9.8	7.1***	10.1	16.2	7.7	8.5***
	Contract of indefinite duration	87.1	83.1	90.2	-7.1***	89.9	83.8	92.3	-8.5***
	Private sector	76.6	81.9	68.1	13.8***	78.8	82.9	73.0	9.9***
	Public sector	23.4	18.1	31.9	-13.8***	21.2	17.1	27.0	-9.9***
	Managers	12.1	3.3	21.2	-17.9***	12.0	3.0	21.5	-18.5***
	PI	20.5	11.6	26.9	-15.4***	21.8	12.8	28.2	-15.4***
	Employees	17.2	22.1	17.1	5.1***	17.4	21.3	16.1	5.2***
	Workers	35.0	58.1	13.9	44.2***	33.8	57.5	13.7	43.8***
	Other	15.1	4.8	20.9	-16.1***	15.006	5.4	20.5	-15.1***
Number of observations		40,655	9,775	16,616		44,460	10,907	16,864	

Chi square test *** at the threshold limit of 1%, ** 5%, * and 10%

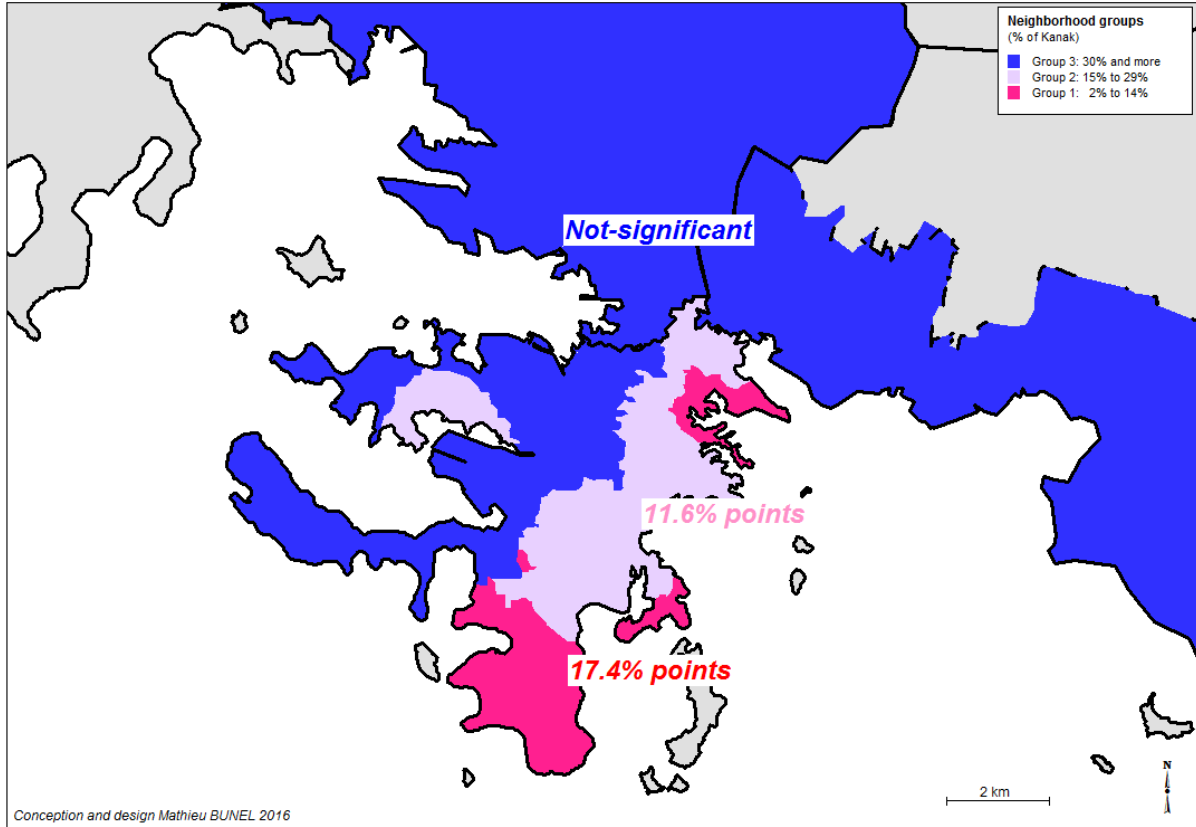
(1) Unemployed in terms of the census

Chosen field: men aged 25-55 from the south province

Source: Data from 2009 and 2014 census, ISEE.

Annex 2

Table A4: Ethnic signal effect (without stability signal) in three neighborhood groups



Note: Group 3 includes the areas of Païta, Dumbéa and Mont Dore even though the proportion of Kanaks is less than 30% in some of these neighborhoods

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