

# Public Housing Magnets: the Impact of Public Housing on Immigrants' Location in France\*

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## Abstract

This paper investigates whether public housing influenced initial location choices of immigrants who arrived in France between 1968 and 1999. I use the variations provided by the massive increase in public housing supply during this period, which was unrelated to the distribution of immigrants across cities. I find a large magnetic effect of the public housing supply across cities on non-European immigrants. Public housing participants are less responsive to differences in economic opportunities than other immigrants are. Cities in which a community's public housing participation rate is large are very attractive to new public housing participants in the same community.

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## Introduction

The economic and cultural impact of immigration in a host country depends theoretically on where immigrants decide (or are able) to locate across cities, regions and neighborhoods (George J. Borjas 2001). Whether the location choice of immigrants across cities or regions depends on a trade-off between economic opportunities and gains from large communities of similar immigrants (Ann P. Bartel 1989, David A. Jaeger 2008) or on differences in welfare availability (George J. Borjas 1999, Neeraj Kaushal 2005) has been discussed widely in the recent empirical literature. This article addresses these issues by studying the impact of housing policies and housing constraints on immigrants' location choice. I use French data, which provide information on public housing participation, to investigate the consequences of differences in public housing availability across cities on the location choices of new immigrants.<sup>1</sup> France is characterized by an extremely large share of the population living in public housing. In 1999, 16% of natives and 31% of immigrants lived in housing projects.<sup>2</sup> Strikingly, some groups of immigrants, particularly non-European immigrants, have much higher participation rates; for example, about 50% of immigrants from Algeria and Morocco in 1999 lived in public housing. Housing projects are often concentrated in suburban places that French call *les banlieues*, where social tensions are often important.

One characteristic of public housing supply is that it varies widely across localities: the share of public housing over total housing varies from 7% in Nice to 44% in Reims, with the average being 20% in 1999.<sup>3</sup> Most housing units were constructed between 1958 and 1978 after the launch of a huge government construction plan. Between 1968 and 1999, the time period considered in this paper, the number of public housing units increased from 1.4 million to 3.4 million. This period of construction was particularly intense: total public housing stock was roughly doubled between 1968 and 1982 (see also Table 6, below) and construction continued

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<sup>1</sup>What I call public housing is what the French call social housing (*logement sociaux*) or 'HLM' (*Habitation à Loyer Modéré*, which means housing with moderated rents). This term designates a form of subsidized housing in France that is the equivalent of public housing in the US and council housing in the UK. In France, most public housing units are rented.

<sup>2</sup>All figures given in the introduction come from author's tabulation with the French census.

<sup>3</sup>To reduce the dispersion of public housing supply across cities, a law enacted in 1999 mandates that every municipality allow 20% of its total housing stock to public housing. Municipalities below that threshold have to pay penalties.

afterward at a slower pace.

Theoretically, public housing supply may influence the location choice of immigrants because the availability of apartments in public housing varies across cities. Public housing rents are an average of 40% lower than in the private sector, and they are even lower for those on welfare or the unemployed.<sup>4</sup> Declining cities can attract public housing applicants because the public housing supply cannot be adjusted in the short term. On the other hand, housing projects might decrease the relative benefits of living in homogeneous ethnic communities for an immigrant. In practice, public housing supply is relatively larger in non-traditional immigrant cities, and it is likely that without public housing, many more immigrants would be otherwise clustered in the "ethnic ghettos" that are commonly found in North America (David M. Cutler, Edward L. Glaeser & Jacob L. Vigdor 2008) and were frequently found in France during the 1960s (Ralph Schor 1996).

The paper exploits the variations in the supply of public housing between 1968 and 1999 both within and across cities to identify the effect of changes and differences in public housing supply on the probability of relocate to that city. For the impact of public housing on the location choice to have a causal interpretation, changes within cities or differences across cities in public housing supply should be unrelated to potentially unobserved changes or differences across cities desirable to immigrants. There is extensive discussion of the political context of the construction program to show that construction decisions were unrelated, or negatively related, to the distribution of immigrants across cities and other observable characteristics of the city. Over the considered period of time, there is no evidence that changes or dispersion in public housing across French cities are related with immigrant flows or immigration issues.

I follow Jaeger (2008) and estimate discrete location choice models that allow coefficients to vary across decades and models, which control for time invariant city characteristics. Whereas the first method captures any changes over time in the determinants of the location choice, the second method identifies the magnetic effect of public housing by exploiting the variations of public housing supply within cities and the fixed effects absorb bias of omitted variables remaining constant over time.

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<sup>4</sup>Immigrants with legal status in France have full access to any kinds of welfare benefits.

The empirical results strongly confirm the hypothesis of a magnetic effect of public housing on immigrants from Maghreb, Africans and refugees. Non-European immigrants during that period were attracted by cities with relatively larger public housing supplies. Results are broadly similar in estimates that control for location-fixed effects and in estimates which permitted coefficients to vary across years. The coefficient estimating the impact of differences in public housing supply is actually doubled in regressions controlling for city fixed effects with respect to cross-section estimates. The effect is greatest for immigrants with children from Maghreb and refugees, and it is relatively robust across alternative specifications such as regressions controlling for housing costs or changes in the choice set. Differences in labor market conditions (measured by unemployment rates) have a much lower or no effect on public housing participants. Quantitatively, estimates controlling for city fixed effects indicate that, for a non-European immigrant with children, a one standard deviation increase in the public housing supply in the city increases the probability of choosing a city of "average" characteristics by 20%-30%. Similarly, results indicate that the location choice of public housing participants is positively influenced by differences in the public housing supply, while a large public housing supply has a negative effect on immigrants in private housing.

Following Marianne Bertrand, Erzo F. P. Luttmer & Sendhil Mullainathan (2000), I also investigate whether ethnic networks influence the location choices of new immigrants participating in public housing by using differences in participation rates across groups and cities as an explanatory variable. I allow the effect to differ between new immigrants living in public and private housing on the premise that, subject to other characteristics, if there is a magnetic effect on the location choice, high participation rates should influence the location of public housing participants but will not influence immigrants in private housing. Empirically, this hypothesis is confirmed by the results: I find that cities in which a given ethnic group has a high participation rate are particularly attractive to new immigrants in public housing, while the effect on the probability of choosing the city is strongly negative for a new immigrant in private housing.

Other results confirm previous findings on immigrants' location choice. As in Bartel (1989) and Jaeger (2008), results indicate that the concentration of similar immigrants is one of the most important determinants of the location choice. The effect is approximately identical across

groups of immigrants and is relatively stable over time. Differences in unemployment rates also significantly influence the location choices of immigrants, but their effect differs across groups and periods and between public housing participants and others.

The literature investigating the location choice of immigrants includes, among others: Bartel (1989), Jaeger (2001, 2008) and Thomas Bauer, Gil Epstein & Ira Gang (2005) for the U.S., Jorn-Steffen Pischke & Johannes Velling (1997) for Germany and Guy Desplanques & Nicole Tabard (1991) and Hubert Jayet & Nadiya Ukrayinchuk (2007) for France. All these papers report a significant effect on the size of similar immigrant communities in cities, but results concerning the effect of differences in economic opportunities are more mixed. Recent studies on location choice have investigated the "welfare magnet" hypothesis, which examines whether differences in welfare availability across U.S. states have a magnetic influence on the location choice of immigrants. The available evidence is once again mixed: for the U.S., Borjas (1999) found evidences of positive effects, whereas Kaushal (2005) reported no impact. Giacomo De Giorgi & Michele Pellizzari (2009) also studied the impact of differences in welfare benefits across European states on immigrant location choice, reporting a positive effect, while Bertrand, Luttmer & Mullainathan (2000) examined the role of social networks in welfare participation across ethnic groups.

Relatively little economic research has been done on the impact of housing policies on immigrants, especially in Europe. Recent research by Albert Saiz (2003, 2007) investigates the impact of immigration on housing markets in the U.S. Recent studies on public housing focus on neighborhood effects in the U.S., including Janet Currie & Aaron Yelowitz (2000), Philip Oreopoulos (2003) and Brian A. Jacob (2004). Related research on the segregation of immigrants and on ghettos is large and includes David M. Cutler, Edward L. Glaeser & Jacob L. Vigdor (1999, 2008) and David M. Cutler & Edward L. Glaeser (1997).

The next section of the paper presents a simple theoretical model of location choice. The second section describes the data. Section three develops the empirical model. The fourth section provides the basic facts of the evolution of public housing supply in France across French cities. Section five presents the empirical results. The last section concludes.

# 1 Theory

The model developed in this section builds upon the work of Borjas (1999) and Edward L. Glaeser & Joseph Gyourko (2005). The basic premise of the model is that there are differences in welfare benefits across locations and fixed costs of mobility. Natives may have little interest in moving to localities that offer the highest benefits because the differences in welfare benefits across regions do not offset the fixed costs of moving. In contrast, immigrants have already paid the fixed costs of migration. Therefore, they can directly choose to live in localities that offer the highest level of welfare benefits.<sup>5</sup>

Because France is a centralized state, there is no variation in the financial aid that an immigrant can receive across the country. On the other hand, as detailed below, French cities are characterized by large differences in the share of public housing units among total housing. Public housing offers considerable benefits because rents are much lower than in the private sector: existing estimates suggest that rents were an average of 40% lower than in the private sector during the 1990s (David Le Blanc, Anne Laferrère & Rémy Pigois 1999) and about 30% lower during the 1970s (Pierre Durif & Olivier Marchand 1975). Moreover, public housing apartments often have four or more rooms available, as they were constructed for family housing; apartments of this size are relatively scarce in the French private rental sector. Eligibility depends on the income per unit of consumption, which must be below a threshold that varies across regions. Public housing management is decentralized and eligible families can apply in any city, regardless of their current location or nationality.<sup>6</sup> Therefore, the attractiveness of public housing, particularly to immigrants, is great: Julien Boeldieu & Suzanne Thave (2000) reports that in 1996, about 200,000 immigrant households were on a waiting list for public housing. Waiting times are relatively long and vary across cities; the average waiting time may be longer than two or three years. Individuals with children or a large family are given priority;

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<sup>5</sup>An alternative explanation for introducing an asymmetry of the effect of public housing supply between natives and immigrants may be that immigrants are discriminated on the private housing market and thus consequently are more attracted by public housing than natives.

<sup>6</sup>There exist about 820 different public housing agencies (*'organismes HLM'*) in France. Public housing agencies are independent organizations responsible for one or several housing projects in their geographical level, usually a municipality or a department. The board of these organizations is typically composed of local politicians from different levels of the French local and national administration. Contrary to several countries where public housing has been privatized, in France all public housing has remained rented until today. See Jean-Marc Stébé (2007) for a concise presentation of public housing organization in France.

the effect in practice is that single individuals have no access to public housing.

To formally develop these ideas, suppose there are two locations, denoted as 1 and 2. Assume that the number of new immigrants is small with respect to the rest of the population, so that the flow of new immigrants does not impact wages or housing costs in the short run. Differences in economic opportunities between the two cities are summarized by the relation between log earnings and skills:

$$w_{ij} = \mu_j + \eta_j v_i$$

where  $w_{ij}$  gives the workers  $i$  log earnings in location  $j$ ; the random variable  $v$  measures the deviations from the mean log earnings and has finite variance;  $\eta_j$  gives the rate of return to skills in the city and  $\mu_j$  can be interpreted as the average log earnings in the city. Without loss of generality, cities are ranked such that city 1 provides higher returns to skills:  $\eta_1 > \eta_2$ . Total utility in location  $j$  is assumed to be a function of earnings, amenities  $A_{ij}$  and housing costs  $C_j$  which differ across cities:

$$U_{ij} = w_{ij} + A_{ij} - C_j \quad (1)$$

If we neglect the effect of amenities, the allocation of migrants will depend on a simple relationship between wages and housing costs across cities. There is a cutoff level for productivity  $\bar{v}$  which determines the city in which an immigrant will live, such that

$$\bar{v} = \frac{(C_1 - C_2) - (\mu_1 - \mu_2)}{\eta_1 - \eta_2} \quad (2)$$

This threshold  $\bar{v}$  depends on differences in housing costs and differences in return to skills across cities. Immigrants with skills below  $\bar{v}$  choose city 2 and those with skills exceeding  $\bar{v}$  city 1.

Finally, we endogenize the relation between wages, housing costs and public housing supply. Suppose that all immigrants are eligible and apply to public housing. In order to capture the uncertainty of public housing eligibility and the effect of varying public housing supply across cities, we assume that the probability of obtaining public housing in city  $j$  is  $p_j$ . Denote by  $R_j$  the rents in the private sector, the expected housing cost of an immigrant in city  $j$  is thus equal

to:

$$C_j = (1 - p_j)R_j + p_jS$$

where  $S$  denotes the rents in public housing, which are similar across cities and are normalized to zero. In order to close the model, I follow Glaeser & Gyourko (2005), Sherwin Rosen (1979) and Jennifer Roback (1982) and assume that, in the long run, some individuals are mobile enough to eliminate utility differences across space and there are no arbitrage relationships between average wages and private rents across cities:

$$\mu_1 - R_1 = \mu_2 - R_2. \quad (3)$$

Given this assumption, the expression in 2 can be simplified to obtain a simple relation between the allocation of immigrants, wage levels and the probability of obtaining an apartment in public housing:

$$\bar{v} = \frac{p_2R_2 - p_1R_1}{\eta_1 - \eta_2} \quad (4)$$

The share of immigrants in city 2 therefore depends positively on the differences in probability of obtaining an apartment in public housing across cities. The product between this probability and rents indicates the expected benefits of choosing the city, which increase with the rents: higher rents reflect higher wages in the city and are therefore indicative of the relative benefits of living in public housing.

One particularity of public housing is that, as with private housing, it is durable and cannot adjust to demand shocks in the short term (Glaeser & Gyourko 2005). With this model, it is straightforward to derive that under some conditions, a decline in economic opportunities can reinforce the attractiveness of a city through its effect on public housing accessibility. Formally, assume that an exogenous shock decreases wages in city 2 such that  $\mu_2$  decline to  $\mu_2^*$ . For the arbitrage condition given by (3) to hold, rents must decline to  $R_2^*$ . To capture the relation between population and housing costs in a simple way, I assume that rents depend on the ratio between the number of inhabitants  $N_j$  in the city and the total housing stock in the city  $H_j$  such that  $R_j = \left(\frac{N_j}{H_j}\right)^\beta$  where  $\beta$  gives the elasticity of rents with respect to the inhabitants to housing ratio and is assumed positive. Assuming that the housing stock is fixed in the short

run, the population must decline until (3) holds. To simplify, I assume that natives moving away from city 1 do not affect wages and rents in city 2 in the short term.<sup>7</sup> Therefore, the no arbitrage condition implies that the population and rents in city 2 decrease to  $N_2^* = kN_2$  and  $R_2^* = k^\beta R_2$  where  $k^\beta = \frac{\mu_2^* - \mu_1 + R_1}{\mu_2 - \mu_1 + R_1} < 1$ . Similarly, to capture the relative scarcity of public housing across cities, I assume that the probability of obtaining a flat in public housing is proportional to the number of public housing units per inhabitants that is  $p_j = \left(\frac{SH_j}{N_j}\right)^\gamma$  where  $SH_j$  is the number of public housing units in the city, and  $\gamma$  is the elasticity of the probability with respect to the public housing units to population ratio. Because the public housing stock is also fixed over time, the population decline produced by economic shock will increase the probability of obtaining a flat in public housing from  $p_2$  to  $p_2^* = k^{-\gamma}p_2$ . City declines will therefore increase the number of new immigrants choosing a city when  $p_2^*R_2^* > p_2R_2$ , which is equivalent to  $k^{\beta-\gamma} > 1$ . If rents are less elastic than the probability of obtaining public housing with respect to change in the city's population, that is  $\beta < \gamma$ , the increase in public housing eligibility probability will compensate for the decrease in wages. The share of new immigrants choosing city 2 now increases despite a decline in economic opportunities in the city.

## 2 Immigration to France and the Census of Population Data

The empirical analysis draws data from the 1968, 1975, 1982, 1990 and 1999 censuses. Throughout the paper, I restrict the sample to men and women aged 16 to 60 and exclude students and individuals in the military.<sup>8</sup> The sampling rate for the individual file is 20% for the 1975 Census and 25% for the 1968, 1982, 1990 and 1999 censuses. These high sampling rates enabled me to study small sub-populations of immigrants separately. As a consequence, the attenuation bias from sampling errors that plagued earlier empirical work on immigration (Abdurrahman Aydemir & George J. Borjas 2006) is less likely to present a problem in this study.

An immigrant is defined as a foreign-born individual who is a non-citizen or naturalized French citizen.<sup>9</sup> Unlike U.S. census data, there is no variable indicating the arrival year for each foreign-born individual until the 1999 census. However, each census reports the location of

<sup>7</sup>The extension to the more general case is straightforward and do not affect qualitatively the results.

<sup>8</sup>However, the population count used to select urban areas included in the analysis includes all individuals.

<sup>9</sup>This definition is identical to the one adopted by the French Statistical Institute.

Table 1: New Immigrants in France 1968-1999

<i>Arrival Period</i>	1962-68	1968-75	1975-82	1982-90	1990-99
Total Number (in thousands)	915	1 053	707	663	689
Number per year	152	150	101	95	77
Share of new immigrants over total immigrant stock	28.3%	27.1	17.5	15.9	16.0
Proportion of Male	60.2%	59.4	50.6	49.9	46.8
Share of University Graduates	2.8%	5.9	11.5	26.1	33.1
<i>Geographical origins of new immigrants</i>					
Europe	64.9%	52.5%	27.3%	30.5%	42.5%
Asia	2.2	6.7	25.1	24.4	15.3
Africa	31.0	38.0	42.6	37.7	35.3
Other	1.9	2.8	5.0	7.3	6.9

*Notes:* New immigrants are immigrants who declared to have lived abroad during the previous census.

*Sources:* Author's tabulations from 1968, 1975, 1982 and 1999 Censuses.

an individual at the time of the previous census. I use this variable to identify newly-arrived immigrants.<sup>10</sup> In this study, a "new immigrant" is therefore an immigrant who declared living abroad at the time of previous census. Table 1 reports estimates of the number of new immigrants over the period. The decline of the annual immigration rates after 1974 is followed by a much larger decline during the 1990s. This decline partly reflects a shift in French immigration policies after 1974, which changed admission conditions during what was perceived as a temporary economic downturn. Theoretically, only migration for family reunion was permitted; in practice, economic immigration never stopped and represented about half of total immigration in 1982.<sup>11</sup> The last rows of Table 1 report changes in composition of the national origins of immigrants: over this period, the share of European-based immigration decreased while African and Asian immigration increased. Simultaneously, immigrants were also increasingly educated.

The geographical unit used to study the location choice of immigrants should approximate the relevant local labor market from which the characteristics determine the location choice (David

<sup>10</sup>Estimates of immigrant flows from the French Statistical Institute typically relies on administrative data from the National Immigration Office and are very similar with the one computed using the census in this study. See Chloé Tavan, Agnès Dugué, Jean-Paul Caille & Maryline Bèque (2005, p.70) for figures based on these data.

<sup>11</sup>See Tavan et al. (2005, p.72) for a decomposition of immigrants across admissions categories based on administrative data

Card 2001).<sup>12</sup> For that purpose, French regions and counties (*régions* and *départements* in French, respectively) appear too wide or are often composed of heterogeneous local labor markets. However, it is too restrictive to consider each municipality as a labor market, especially in France where urban agglomerations typically aggregate dozens of different municipalities.<sup>13</sup> I approximate local labor markets using urban areas constructed by the French Statistical Institute for the 1990 census. By definition, urban areas are aggregation of municipalities between which there are no discontinuities across constructions. Because buildings are constructed and destroyed between censuses, new urban units are defined during each census.<sup>14</sup> Each urban area is therefore matched across censuses using the national municipality code, which identifies each municipality with a consistent number over time.<sup>15</sup> A list of the 29 urban areas with more than 200,000 inhabitants in 1990 is reported in Table 1 along with the name of the main municipality.<sup>16</sup>

Information on whether a dwelling is on the public rented sector is available from the Census of Housing. In order to estimate the public housing supply per urban areas across years, I use the exhaustive dwelling file from the 1990 and 1999 censuses, which includes all dwellings and buildings existing in France during those years. Because censuses prior to 1982 did not collect information on public housing participation and did not denote whether a dwelling belonged to public housing, I retrospectively approximate the number of public housing units per urban area for these years by using a variable indicating the construction year of each building. The number of housings in public housing in 1999 is calculated with the 1999 census of Housing, and the 1990 census is used for other years. Since most construction plans started in 1958 and there were no destructions of public housing units during that period, this method is a relatively accurate approximation of the dispersion and evolution of public housing over time in various

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<sup>12</sup>Previous studies used either US states (Jaeger 2008; Kaushal 2005) or metropolitan areas (SMSAs) (Bartel 1989; Bauer, Epstein & Gang 2005).

<sup>13</sup>For example, the urban area of Paris in 1990 is composed of 398 municipalities whereas the urban area of Toulouse is composed of 58 municipalities. The median number of municipalities for the 77 urban areas of more than 70000 inhabitants in 1990 is 16. The total number of municipalities in France is extremely large: 36 571 at the first of March 2008.

<sup>14</sup>I use the term city and urban area interchangeably throughout the paper to refer to the 1990 urban areas.

<sup>15</sup>Each municipality has a unique administrative identifier since 1945, which enables to match similar cities over time. Therefore, we do not have the problem of changes in the boundaries of cities over time, which is encountered in the US Censuses.

<sup>16</sup>Arbitrarily, the main municipality of the urban unit is defined as the most populated municipality of the area.

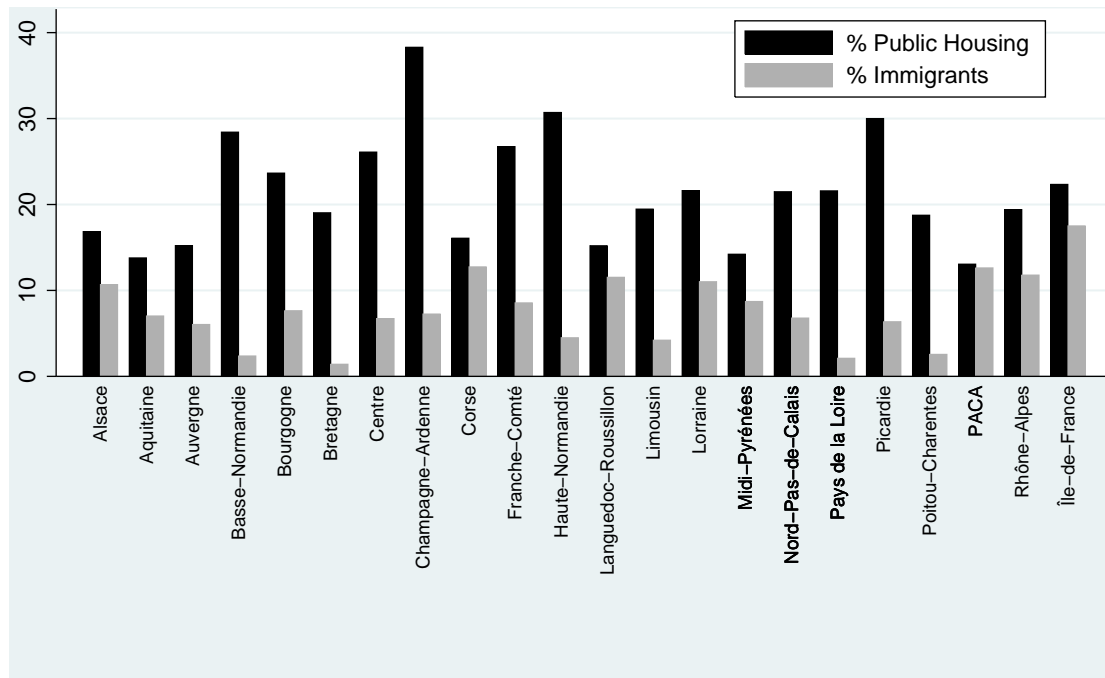


Figure 1: Public Housing Share over Housing Stock and Immigrants' Share per Region in 1990

Source: 1990 Census of population.

cities.

Figure 1 reports the immigrant share of the population and the proportion of public housing across regions in 1990. The figure reveals no particular correlations between the two. Regions such as *Champagne-Ardenne* have a very large supply of public housing units and relatively few immigrants. Similarly, Table 2 indicates the share of public housing over total housing and the share of immigrants across the largest cities in 1990. These figures also reveal large variations in public housing supply across cities: the share of public housing over total housing varies from 8% in Nice to 31% in Rouen. The data also suggests there is a negative correlation between the public housing supply and the immigrant share: the correlation coefficient between the two is -0.29 for the cities in the table, -0.22 for the 57 cities with more than 100,000 inhabitants in 1990 and -0.11 for all 110 cities with greater than 50,000 inhabitants.

I now briefly document the participation rates of immigrants in public housing.<sup>17</sup> Table 1 reports the proportion of immigrants and natives living in public housing in 1982, 1990 and 1999.<sup>18</sup> The percentage differs widely between natives and immigrants and across immigrant

<sup>17</sup>See also Boeldieu & Thave (2000).

<sup>18</sup>There is no data on public housing participation in the 1968 and in 1975 censuses, and to my knowledge, there is no alternative source available to study the participation rates of immigrants before 1982. The "housing

Table 2: Major Urban Area Characteristics in 1990

City	Total Population	Share Public Housing	Immigrants to Population	Share of New Immigrants	Share of Natives
Paris	9 316 656	22.1%	19.3%	51.8%	25.5%
Lyon	1 262 263	20.1	14.7	3.5	3.5
Aix-Marseille	1 230 071	15.8	11.6	2.5	3.4
Lille	959 516	24.6	9.8	1.7	2.6
Bordeaux	696 587	16.4	7.6	1.4	2
Toulouse	649 990	14.4	10.1	1.6	1.9
Nice	517 124	7.8	13.8	1.6	1.4
Nantes	495 307	19.8	3.8	0.6	1.5
Toulon	437 715	10.7	8.9	0.5	1.2
Grenoble	404 607	16.2	15.8	1.1	1.1
Strasbourg	387 635	19.8	14.4	1.6	1.1
Rouen	380 276	30.9	6.7	0.6	1.1
Valenciennes	338 539	18.5	6.5	0.3	0.9
Antibes	335 761	7.1	15.5	1.3	0.9
Nancy	329 476	21.4	7.7	0.6	0.9
Lens	323 097	19	4.2	0.1	0.9
Saint-Etienne	313 337	21.8	12	0.5	0.8
Tours	282 211	25.1	7.1	0.3	0.8
Bruay-La-Buissière	261 790	12.4	1.4	0.1	0.8
Clermont-Ferrand	254 349	16.1	11.7	0.4	0.7
Le Havre	253 539	32.8	5.9	0.2	0.7
Montpellier	248 320	12.8	12	0.9	0.6
Rennes	245 085	22.8	4.3	0.5	0.7
Orleans	242 969	19.7	11	0.6	0.7
Dijon	230 476	17.9	9.7	0.4	0.7
Mulhouse	223 598	15.1	15.3	0.7	0.6
Angers	208 321	29.9	3.8	0.2	0.6
Reims	206 427	43.8	8	0.3	0.6
Brest	201 469	17	2.4	0.1	0.6

*Notes:* Column (1) reports the total population including all individuals. Column (2) reports the proportion of public housing among all dwellings. Only primary residence and inhabited housing are included in the calculations. Population taken into account in the calculations of the other columns is restricted to men and women between 16 and 60 not in school and not in the military.

*Sources:* 1990 census. Author's calculation.

Table 3: Participation rates in Public Housing per Nationality

	1982	1990	1999
Natives	13.6%	14.0%	15.7%
Immigrants	22.9	25.8	30.6
New Immigrants	27.6	22.2	24.6
<i>Percentage of Immigrants in Public Housing from</i>			
<b>Europe</b>	16.0%	15.8%	16.3%
<i>Pologne</i>	9.6	13.1	19.6
<i>Spain</i>	17.2	16.8	17
<i>Portugal</i>	24.8	24.1	22.5
<i>Italy</i>	11.3	11	12.3
<b>Africa</b>	33.1	39.1	46.4
<i>Algeria</i>	34.8	42.5	49.7
<i>Morocco</i>	37.3	43.1	48.3
<i>Tunisia</i>	27.6	43.1	39.2
<b>Asia</b>	31.4	30.9	33.5
<i>Turkey</i>	39.8	31.3	48.9
<i>Cambodge</i>	35.6	35.5	35.1
<i>Liban</i>	14.3	11.2	18.3
<i>Vietnam</i>	30.8	32.7	30.4
<b>Others</b>	12.5	13.1	16.9

Notes: Calculations include the whole population. Sources: 1999, 1990 and 1982 Censuses. Author's tabulations.

groups. In 1999, the percentage of immigrants living in public housing is double of the percentage of natives in public housing. Across immigrant groups, the share of immigrants in public housing is particularly large for immigrants from Africa and Asia: about half of immigrants from Maghreb live in public housing in 1999, implying that there is a difference of 34 percentage points in the participation rate of this group as compared to natives. The evolution in participation rates was quite spectacular between 1982 and 1999, since the figures reveal that the percentage of immigrants participating in public housing increased by 10-15 percentage points for immigrants from Maghreb.

A lesser-known fact that motivates this research is that the distribution of non-European immigrants in public and private housing across cities differs widely: public housing participants are much less concentrated across cities than private housing participants. Table 4 reports the Herfindahl and the dissimilarity index of the distribution of immigrants across cities with sev-

conditions surveys" (*Enquêtes Logement*) of 1973 and 1978 collected by the French statistical institute did collect information on public housing participation but do not contain information on nationality.

Table 4: Cities Characteristics for Average Individuals in Private and Public Housing in 1999

	Herfindahl index	Dissimilarity index	Share in Paris/Lyon/Marseille	Immigrant Share
<i>Maghreb</i>				
Public Housing	0.12	0.16	42.1	12.5
Private Housing	0.18	0.22	50.9	13.3
<i>Africa</i>				
Public Housing	0.33	0.32	63.6	14.3
Private Housing	0.45	0.34	72.7	15.2
<i>Asia</i>				
Public Housing	0.13	0.24	41.4	12.8
Private Housing	0.38	0.34	67.8	15.1
<i>Europe</i>				
Public Housing	0.17	0.19	46.4	13.2
Private Housing	0.19	0.19	48.9	13.4

*Notes and Sources:* The sample includes all new immigrants who arrived between 1968 and 1999. The first column indicate the Herfindahl index across all urban areas for the group. The second column indicates the dissimilarity index using cities as a base geographical unit. The third column indicates the share of the group living in Paris,Lyon or Marseille, the fourth column indicates the immigrant share of the city for the average immigrant.

eral characteristics of cities for individuals in private and public housing in 1999.<sup>19</sup> Figures from the first two columns suggest that individuals in public housing tend to be less concentrated across French cities. For most groups, both the Herfindahl and the dissimilarity index for the public housing group are lower, particularly for immigrants from Asia and Africa. The third column indicates that a considerably lower share of immigrants in public housing live in traditional immigrant cities (Paris, Lyon and Marseille) particularly African or Asian immigrants, as compared to immigrants in private housing. For European immigrants, differences in city characteristics between individuals in private and in public housing are negligible. Finally, the last column indicates that, on average, public housing participants live in cities with fewer immigrants.

This evidence suggests that if public housing has a causal effect on location choice, public housing has attracted immigrants in cities with a lower concentration of immigrants, thus having the effect of "spreading" immigration across French cities. Moreover, public housing authorities try to avoid the formation of ethnic clusters of immigrants from the same origins by disseminating them across projects. At the neighborhood level, some immigrants are thus more likely to live in housing projects containing relatively mixed neighborhoods, and are less likely to live in cities or neighborhoods with a high concentration of immigrants from the same ethnic group. An important limitation of these comparisons is that we are not controlling for other factors that may be correlated with public housing supply, which may also exert a direct effect on the location choice. To extend the analysis, we need a more complete econometric model of location choice.

### **3 Econometric Model**

I now specify the simple econometric model that I use to study the determinants of the location choice of new immigrants and I discuss the constructions of the data. I first estimate a separate model of location choice for each cohort of migrants arriving in France between two censuses from 1966 to 1999. The coefficients are permitted to vary across cohorts and can therefore

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<sup>19</sup>The dissimilarity index uses cities as the base geographical definition. It represents the share of immigrants that would have to switch cities in order to achieve an even distribution across cities.

capture any changes in the determinants of the location choice.

To identify the magnetic effect of public housing, I use the number of public housing units per inhabitants, denoted as  $p_j$ . Since differences in rents across housing projects are negligible, the estimated parameter will provide a direct test of whether differences in public housing supply have an impact on location choice. Since no information on wages is collected in the census, I use the differences in unemployment rates across cities to estimate the effect of differences of economic condition. In order to capture differences between housing-eligible immigrants and other types of residents, given the fact that information on public housing participation over the whole period is unavailable, the effect of public housing is permitted to differ between new immigrants who are couples with children or those without children. Because housing costs are likely to be higher for immigrants with children, they are more likely to be eligible to public housing. Theory suggests that if there is a magnetic effect of public housing, we should find a greater impact in public housing supply for immigrants with children. Moreover, for many public housing agencies, families with children receive priority. The probabilistic version of the utility function described by equation (1) is given by:

$$U_{ij} = X_{ij}\beta + \delta_1(p_j \times C_i) + \delta_2(p_j \times (1 - C_i)) + \gamma_1(L_j \times C_i) + \gamma_2(L_j \times (1 - C_i)) + \epsilon_{ij} \quad (5)$$

where  $U_{ij}$  is the level of utility provided by location  $j$  to individual  $i$ ,  $L_j$  is the unemployment rate in city  $j$ ,  $C_i$  is a dummy variable indicating whether an individual lives as a couple with children. The unobserved component of utility  $\epsilon_{ij}$  captures unobserved factors affecting utility. The resulting estimates of  $\delta_1$  and  $\delta_2$  provide information on the effect of public housing supply on the utility of immigrants with children and others, whereas  $\gamma_1$  and  $\gamma_2$  indicates the effect of differences in unemployment rates across cities.

Several variables influencing the location choice may have been omitted from previous regressions. If this is the case, the public housing supply may be correlated with unobservable or omitted characteristics of the city that will bias the estimated coefficients. The second method follows Jaeger (2008) and adds city-fixed effects that absorb the effect of unobservable or omit-

ted constant over time city characteristics. Formally, I estimate the regression:

$$U_{ijt} = X_{ijt}\beta + \delta_1(p_{jt} \times C_{it}) + \delta_2(p_{jt} \times (1 - C_{it})) + \gamma_1(L_{jt} \times C_{it}) + \gamma_2(L_{jt} \times (1 - C_{it})) + \Gamma_j + \epsilon_{ijt} \quad (6)$$

The fixed effects  $\Gamma_j$  control for constant over time unobservable characteristics of the city which may influence immigrants' location decisions. Identification in this case relies from within-location variation of the covariates over time. I estimate the model by pooling all cohorts together in the sample. Therefore, I use changes in the number of public housing units during 1968-1999 across cities to identify a potential magnetic effect of public housing on location choice. However, as reported below, immigrants appear to have been discriminated against during the 1960s when attempting to access the first wave of public housing construction. Therefore, I anticipate that differences in public housing supply may have a lower or no effect on location decisions in 1968, which is confirmed by cross-section regressions. In regressions with fixed effects, I allow the effect of public housing in 1968 to be different than in other years.

After 1982, information is available in the census on whether an individual is living in public housing or not. A direct test of the impact of public housing on the location choice allows the effect of unemployment rates and public housing supply to differ between new immigrants living in public housing and immigrants in private housing. I estimate the following model by pooling all cohorts from 1968 to 1999:

$$U_{ijt} = X_{ijt}\beta + \delta_1(p_{jt} \times PH_{it}) + \delta_2(p_{jt} \times (1 - PH_{it})) + \gamma_1(L_{jt} \times PH_{it}) + \gamma_2(L_{jt} \times (1 - PH_{it})) + \Gamma_j + \epsilon_{ijt} \quad (7)$$

where  $PH_{it}$  is an indicator variable equal to one if individual  $i$  observed in census  $t$  lives in public housing. This model is similar than the previous one, except that the effect of unemployment and public housing differs between public housing participants and others for individuals in the 1982, 1990 and 1999 census. For individuals arriving before 1975, controls for differences in unemployment rates and public housing supply across cities are also included.

Another strategy used to determine whether public housing influenced the location choice of

immigrants is to use the differences in participation rates in public housing across cities and national groups as a determinant of location choice. Information on welfare availability may differ across cities and groups and may depend on local ethnic networks. As a proxy for information available to the ethnic group, Bertrand, Luttmer & Mullainathan (2000) used variations of the participation rates across groups and cities to identify the effect of ethnic networks on public housing participants. If most immigrants of one group in a city live in public housing, this city should be attractive to new immigrant public housing participants and unattractive to new immigrants in private housing, assuming that their choice is influenced by the availability of public housing. In that case, the choices of public housing participants should differ from those of new immigrants in private housing and be related to differences in participation rates across cities. To test that hypothesis, I perform Regression (7) using the participation rate in public housing of the group instead of the dispersion of public housing supply across cities. In this case, ethnic groups are defined using the immigrants' country of origin.

To estimate (5), (6) and (7), an assumption must be made regarding the density of the unobserved portion of utility  $f(\epsilon_i)$ . I follow the current approach used in literature regarding immigrants' location choice and assume that  $\epsilon_{ik}$  is an independent and identically-distributed extreme value.<sup>20</sup> One characteristic of the conditional logit model is that the relative odds of choosing two alternatives are independent from the availability or attributes of other alternatives, a property which is known as the Independence from Irrelevant Alternatives, or IIA. This hypothesis, common in literature on immigrant's location choice, considerably simplifies the analysis.<sup>21</sup>

The choice set is composed of 57 urban areas with a total population greater than 100,000 inhabitants in 1990. These urban areas were chosen by more than 85% of immigrants in 1968 and 1990.<sup>22</sup> Including additional alternatives would disproportionately increase the choice set by adding relatively rare (and therefore undesirable) alternatives without adding many indi-

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<sup>20</sup>The conditional logit model is used in Bartel (1989), Kaushal (2005), Bauer, Epstein & Gang (2005), Jaeger (2008) and Giorgi & Pellizzari (2009).

<sup>21</sup>An alternative would be to estimate a nested logit which partially relax the IIA assumption. Each nest would include for example locations in the same region. This approach requires a computationally more complex estimation procedure and would require more identifying variance than what we can get from the data in which many predictors included vary only at the city level. Moreover, there is no straightforward way to decide how nests should be defined and results may depend on this choice (Daniel L. McFadden 1982).

<sup>22</sup>If one excludes European immigrants, the percentage increases to 92% in 1968 and 90% in 1990.

vidual observations in the sample. I have checked the sensitivity of the estimations to the inclusion or exclusion of several alternatives with several IIA tests (Jerry Hausman & Daniel McFadden 1984). I estimated the model using a sample that includes all urban areas with more than 50,000 inhabitants (increasing the choice set from 53 to 110 alternatives) and found that the IIA hypothesis is usually not rejected. Moreover, results relative to the impact of public housing on the location choice are qualitatively unaffected by such changes in the choice set. I also tested whether estimates of the parameters were sensitive to the inclusion or exclusion of the Paris urban area in the choice set and found that qualitative results of the regressions are not affected. All of these results do not offer evidence against the use of a conditional logit, even though it is well-known that these tests have a low power.

Several variables introduced in  $X_{ij}$  aim to capture the effect of community size (of those from the same region/country of birth) on location decision. Large communities of similar immigrants may offer larger networks for finding jobs, a larger linguistic community and may also minimize the psychological costs of living in another country. I use two variables to evaluate the effect of the size of the community: for each urban area, I compute the percentage of individuals in the city who are immigrants from the same country/region of birth and the percentage of the community living in the urban area. New immigrants are excluded from the calculation. The first variable indicates the community size relative to the city population, and the second variable indicates the absolute size of the community living in the city.

Because of limitations in the number of nationalities available in the data, as well as concerns about sampling errors, previous studies using U.S. data often aggregated immigrants from the same region of birth to compute concentration indexes. However, aggregating immigrants such as Turks or Chinese in the same "Asian" category is likely to downplay the effect of community size in the case of France. For example, it is relatively unlikely that the size of the Chinese community may have an influence on the location decision of Turkish immigrants.<sup>23</sup> Unlike previous studies and because of the large sample extracts available over the chosen period, I distinguish between groups by using 54 different countries of birth, which are always reported separately across censuses. I assign other individuals (less than 5% of new immigrants on av-

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<sup>23</sup>Unreported estimates show that the estimated effect of immigrant concentration is much lower when the indexes of immigrant concentration are defined by region of birth instead of country of birth.

erage) into four regions of birth groups (Europe, Asia, Africa and Other). I also include the total immigrant share of the city in the regression, including immigrants from all origins. This variable controls for the characteristics that cities with many immigrants ("traditional immigrant cities") might have. Cities with many immigrants may be more attractive because there are more tolerant to the presence of immigrants, for example.

Other variables included in the vector of  $X_{ij}$  control for cities' economic characteristics. I include the log of the total population of the urban area in the regression, which controls for the attraction of large cities may have for immigrants. The population size is likely to be correlated with job opportunities and general economic dynamism. Similarly, differences in industrial structure across cities may also influence immigrant choices, since their occupational distribution is different from those of natives. I use the percentage of workers employed in manufacturing (as opposed to workers in the service industry or in public administration) by using information on industry affiliations, and I also include the percentage of university graduates.

Several additional unobserved specific country-of-origins characteristics may also determine location choice. Therefore, a separate model of location choice for four different groups of immigrants is estimated. I divide the immigrants in four countries/regions of birth and perform separate regressions for immigrants from Maghreb (which includes Algeria, Morocco and Tunisia), Africa, Asia and Europe.

Since the study covers a relatively long time period of time, one concern may be the change in the relative share of immigrants from different admission categories over time.<sup>24</sup> In 1974, France restricted its admission policy for economic immigrants, but facilitated family reunion migration. Immigrants admitted for family reunion may not possess the same skills as economic immigrants (Barry R. Chiswick 1986), and their location decision may depend on the location of family members already living in France; therefore, their decisions may be unrelated to city characteristics. There is no information reported in the census on the admission category of new immigrants. However, according to the best available figures from Tavan et al.

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<sup>24</sup>Jaeger (2008) using administrative data from the US Immigration and Naturalization Service estimates a different model of location choice for each different immigrant categories. Typically, he reports few differences across categories.

(2005, p.72), 80% of immigrants admitted for family reunion are female and most of the others are children. To deal with that issue, I restrict the sample to include only adult male immigrants and exclude individuals reported as a child in a household.

Similarly, since economic factors are not the prime determinants of refugees' migration decisions, they should also be distinguished in the analysis. I follow the standard practice of U.S. studies (see e.g. Borjas, 1999) to classify all immigrants who originate from main refugee-sending countries as refugees. However, refugees who arrived in France during the 1960s and 1990s came from countries from which economic migration was also great (e.g., Spain, Algeria and Portugal during the 1960s, and Turkey, Algeria and China during the 1990s). Therefore, I focus on the more easily identifiable waves of refugees who arrived in France between 1974 and 1990. Most refugees during that period came from a small set of countries and arrived during a very specific period of time. Immigrants arriving from Cambodia, Sri-Lanka, Vietnam and Laos during 1975-1990 are included in this pool.<sup>25</sup> Immigrants arriving from Angola, Zaire, Sri-Lanka and Haiti during 1982-1990 are similarly classified as refugees. I perform a separate analysis for each country/region and for refugees.

Table 5 reports the averages of the variables included in the regression. The average graduate share was multiplied by four, whereas the manufacturing share of employment decreased. The average unemployment rate also increased over the period, from 2.1% to 16% in 1999, while the dispersion across cities also increased.

In each regression, I standardize all predictors of each individual choice set to have an average of zero and a standard deviation of one across the 57 urban areas included in the study. Concentration indexes, which vary per country of origin and city, are standardized within each country: this is equivalent to assuming that the relative dispersion of these variables within groups determines the choice, rather than the absolute value of the percentages.<sup>26</sup> For other variables, in cross-section estimates, this normalization only changes the scale of the parameters. In estimates in which several cohorts of immigrants are pooled, this normalization implies that the

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<sup>25</sup>According to Alexis Spire (1998), more than 80% of immigrants from these countries were admitted as refugees. In 1997, 2/3 of refugees who arrived in France after 1974 came from Asian countries.

<sup>26</sup>The average percentage of city population for immigrants from Algeria is 1% whereas it is 0.01% for immigrants from Cameroon. Because the size of these two groups is different, normalizing is similar to assuming that a percentage of similar immigrants of 1% has a different effect on immigrants from Cameroon than on immigrants from Algeria.

Table 5: Average Characteristics of Cities

	1968	1975	1982	1990	1999
Median population	88 912	105 055	106 956	103 111	117 682
Immigrant Share of Population	6.6 (4.7)	7.3 (4.8)	8.3 (4.7)	7.9 (4.0)	8 (3.7)
University Graduates Share	5 (1.8)	10.7 (3.4)	13.9 (3.6)	19.3 (5.0)	28.5 (6.5)
Manufacturing Share	43 (10.9)	39.7 (10.2)	33.7 (8.9)	28.3 (7.2)	22.3 (6.0)
Unemployment Rate	2.5 (1.1)	4.5 (1.4)	10.7 (2.0)	13.7 (3.4)	16 (3.8)
Public Housing per inhabitants	7.4 (2.9)	11.1 (4.1)	13.6 (4.8)	15.7 (5.3)	17.1 (5.0)

*Notes:* The table reports the average and standard deviations of the indicated city characteristics. Cities included in the sample are the 57 cities with more than 100 000 total inhabitants in 1990. The population only includes men and women aged 16-60 not enrolled in school or in the military. Standard deviations are in parenthesis. *Sources:* 1968, 1975, 1982, 1990 and 1999 Census of population and 1990 and 1999 Census of Housing.

choice depends on the relative dispersion of variables across cities during the census year and that changes in the absolute value of a variable over time are not relevant. Since the average of several variables included in the analysis changes over time, not normalizing the predictors would yield inaccurate implications; for example, the weighted average unemployment rate across cities was 10 percentage points greater in 1990 than in 1968.

Because of the logistic form of the model, all coefficients have a simple and straightforward interpretation. Denote  $P$  as the predicted probability of the average city and  $P_k$  as the predicted probability of the average city in which the variable  $k$  is higher by one standard deviation. In the appendix, I show that the coefficient of a conditional logit in which the predictors have been standardized is equal to the log difference between these two probabilities, that is:

$$\log P_k - \log P = \gamma_k$$

where  $\gamma_k = \beta_k \sigma_{x^k}$  and  $\sigma_{x^k}$  is the standard deviation of the variable  $k$  with respect to initial alternatives included in the choice set.

Another issue is that new immigrants are defined as those who arrived between two censuses. Therefore, their exact arrival date may vary between 1-8 years prior to a census date, depending on the period of time between censuses. This diversity can potentially be a problem if immigrant locations change frequently during their first few years in France.<sup>27</sup> There is no variable indicating the arrival year of migrants in 1982 and in 1990. A variable indicating the arrival year for migrants arriving in France since the last census is only partially available in the 1968 and the 1974 censuses.<sup>28</sup> To determine whether duration in France affects location choice, I estimated different location choice models by grouping new immigrants by three-year arrival groups for those who arrived between 1962-1968, 1969-1974 and 1990-1999. Most of the time, results were not qualitatively different across different arrival years. Moreover, admissions decisions in public housing typically takes time, implying that the magnetic effect of public housing on immigrant location decisions may not be observed by the initial location, but only after a few years in France when an admission to public housing has been granted. Finally, in the estimations presented below, for immigrants matched with census data from 1968, I only included immigrants arriving in 1966, 1967, or during the first months of 1968 in order to eliminate non-French refugees from Algeria arriving in France after the end of the Colonial War.<sup>29</sup> For other censuses, the sample includes all new immigrants.

## **4 Changes in Public Housing Supply and Immigration**

A potential identification problem may be that the changes in public housing supply over time are a political response to immigrant flows, provoked by other unobserved factors. If this is the case, a positive coefficient of the public housing supply may therefore reflect the construction decisions which followed previous immigrant flows. Below, I provide historical and empirical evidence on construction decisions across cities that alleviate this concern. I find that construc-

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<sup>27</sup>Jaeger (2008) and Kaushal (2005) using an exhaustive administrative dataset of legal immigrants from the US immigration service's attempt to deal with this problem by restricting the sample to individuals who arrived the same year using the address where the green card was sent. Bartel (1989) uses the 1990/1982 sample of US Census which indicates the arrival year of immigrants and aggregates immigrants by cohorts of five arrival years.

<sup>28</sup>Values are missing for about 20% of the sample in 1968 and more than 30% in 1974.

<sup>29</sup>By definition, French repatriates from Algeria are not considered to be immigrants because they are French citizens. See Jennifer Hunt (1992) on the consequence of immigration on the French labor market of the French repatriates.

tion decisions mostly reflected local preferences for public housing from the population or local politicians and were not related to any observable characteristics of the city (such as the initial unemployment rate or immigrant share). If anything, more public housing was constructed in cities with fewer immigrants and with already a large stock of public housing.

The political context of the public housing program was relatively particular (Stébé 2007). After the Second World War, most dwellings lacked access to basic necessities (among other things, access to running water in 1957 was still rare). This situation was partially the result of war destructions but also of rent control policies for new constructions established in 1948, which drastically reduced the economic benefits of housing investments. Therefore, during the 1950s, because of housing supply shortages, there was a strong political consensus for state intervention in the housing market. However, the first plan was delayed by the colonial wars and the political instability of the IVth Republic. In 1958, during a period of rapid economic growth, the Gaullist government launched construction on a massive scale of ZUPs (*Zones à Urbaniser en Priorité* literally, "priority development areas"). The ZUPs were blocks of rented properties comprised of thousands of flats in newly-created suburbs. During the 1960s, the plan was considered to be a success. Table 6 indicates that during 1968-1975, the amount of public housing in France increased by 60%. However, during the next decade, the first oil shock in 1974 halted many projects due to lack of funding associated with increasing complaints regarding the inhumanity of some high-rise housing projects. Mass construction plans (*grand ensembles*) were forbidden by the government after 1975, and the construction of public housing continued at a slower pace in the form of smaller housing projects, as shown in Table 6.

In the second section, I have documented a negative correlation between public housing supply and the immigrant share. I now present evidences that the *changes* in the public housing supply across cities over the studied period were unrelated with cities' initial immigrant stocks or other observable characteristics of a city's economy. Figure 2 represents the changes in the proportion of public housing per inhabitants during 1968-1990 across cities over the initial level of immigrants in 1968 for 433 urban areas with more than 10 000 inhabitants in 1990. Circle sizes reflect differences in total population across cities. This figure suggests, if anything, a small negative correlation: regressions of change in the number of public housing per

Table 6: Estimated Changes in Public Housing 1968-1999

Year	Public Housing Units Stock	Pct Change	Pub. Housing per Inhabitants	Std.
1945	275 293			
1968	1 395 489	400%	7.4%	2.9
1975	2 239 117	60	11.1	4.1
1982	2 724 571	22	13.6	4.8
1990	3 092 660	14	15.7	7.3
1999	3 454 054	12	17.1	5

*Notes:* Only primary residences in urban areas with more than 10 000 inhabitants in 1990 are included in the calculations. *Pub. Housing per Inhabitants* and *Std.* columns reports respectively the average and standard deviation of the public housing supply per inhabitants across the 57 cities with more than 100 000 inhabitants in 1990. The public housing unit stock is estimated retrospectively using building construction dates from the 1999 Census of Housing. *Sources:* Author's tabulations from 1999 Census of Housing and the 1968, 1975, 1982, 1990 and 1999 Censuses of Population.

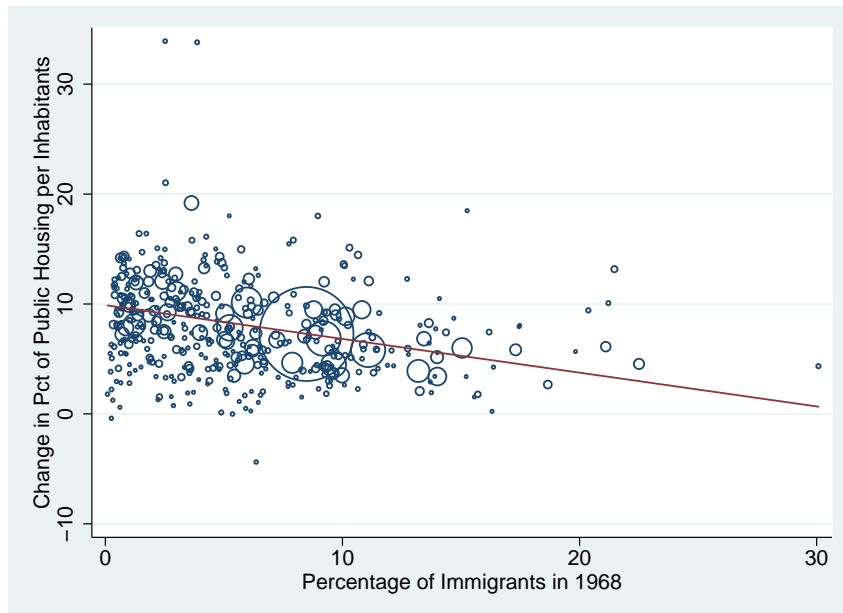


Figure 2: Change in Public Housing Supply 1968-1990 over Immigrant Share in 1968

Sources: 1968 and 1990 Censuses of Population, 1990 Census of Housing.

head on the percentage of immigrants in 1968, including all 433 cities in the sample, yield a coefficient (standard error) of -0.307 (0.033) when weighted by population size and -0.201 (0.043) when unweighted. Similar regressions including only the 57 largest urban areas with more than 100,000 inhabitants in 1990 yield a coefficient of -0.38 (0.07) when weighted by population size and -0.35 (0.07) when unweighted. The change in public housing size is also uncorrelated with the presence of Algerian immigrants, who experienced the worst housing conditions during the 1960s (slums around Paris and other major cities were common during that period). The estimated coefficients are -0.63 (0.46) when weighted and -0.66 (0.58) when unweighted for the 57 largest cities.

Table 7 reports the results of several OLS regressions of the change in percentage of public housing and the percentage of immigrants for different decades, including additional controls for other city characteristics. The first column in the sample includes 433 cities with more than 10 000 inhabitants in 1990 and other columns restrict the sample to 57 cities with more than 100 000 inhabitants in 1990. Results reveal a negative correlation between change in public housing per inhabitants and the proportion of immigrants in city population in 1968. The other columns confirm the absence of correlation between decadal changes in the percentage of public housing per inhabitants with the initial percentage of immigrants in the city. Unreported regressions indicate that results are similar if the percentage of immigrants from Maghreb (or immigrants from other countries) is used instead of the percentage of total immigrants. Other coefficients also indicate no significant relationship over the period between change in the share of public housing and unemployment rates or manufacturing shares. The last four columns add the initial supply of public housing across cities to derive how the change in public housing supply was related to the initial stock of public housing and whether there is an impact on being governed by a left-wing mayor. This last variable is simply the ratio between the years in which the main municipality was governed by a left-wing mayor over the number of years of the period.<sup>30</sup>

On the whole, the evidence suggests a highly significant and positive relation between change in public housing per inhabitants and the initial stock of public housing per inhabi-

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<sup>30</sup>Municipal elections took place in 1971, 1977, 1983, 1989 and 1995. Mayors without political affiliation (only in 3 cities) are given half the weight of the left.

Table 7: Determinants of the Change in Public Housing Supply per Inhabitants

	<i>Outcome Variable: Change in the percentage of public housing/population TTT-1 in the city</i>									
Period	68-90	68-90	68-75	75-82	82-90	90-99	68-90	68-75	75-82	82-90
Percentage Immigrants	-0.161 (0.046)	-0.322 (0.090)	-0.116 (0.051)	-0.128 (0.029)	-0.071 (0.025)	-0.047 (0.066)	-0.241 (0.079)	-0.094 (0.049)	-0.085 (0.028)	-0.036 (0.022)
Log Total Population	0.671 (0.190)	-0.08 (0.450)	-0.022 (0.257)	0.088 (0.172)	-0.127 (0.142)	0.418 (0.320)	-0.399 (0.393)	-0.178 (0.249)	0.128 (0.156)	-0.072 (0.117)
Unemployment Rate	-0.364 (0.207)	-0.397 (0.360)	-0.364 (0.206)	-0.128 (0.105)	0.070 (0.061)	0.143 (0.090)	0.645 (0.384)	0.030 (0.243)	0.042 (0.108)	0.136 (0.051)
Manufacturing Share	-0.026 (0.020)	0.011 (0.054)	-0.067 (0.031)	0.038 (0.024)	0.056 (0.019)	0.071 (0.050)	0.069 (0.050)	-0.040 (0.031)	0.056 (0.023)	0.061 (0.016)
Percentage University Graduates	-0.524 (0.148)	-0.484 (0.299)	-0.263 (0.171)	-0.062 (0.068)	0.025 (0.051)	0.002 (0.080)	-0.230 (0.263)	-0.152 (0.167)	-0.043 (0.064)	0.043 (0.042)
Public Housing Share in T-1							0.616 (0.138)	0.240 (0.088)	0.132 (0.036)	0.107 (0.020)
Share Left in Municipality							1.273 (0.787)	0.333 (0.421)	0.330 (0.299)	-0.048 (0.189)
N	433	57	57	57	57	57	57	57	57	57
R2	0.09	0.34	0.45	0.38	0.17	0.34	0.59	0.44	0.58	0.61
Av. Change	7.8 (4.3)	8.3 (3.1)	3.6 (1.7)	2.5 (1.3)	2.1 (1.0)	1.4 (1.9)	8.3 (3.1)	3.6 (1.7)	2.5 (1.3)	2.1 (1.0)

*Notes:* Each column reports the results of an OLS regression where the dependant variable is the change in the number of public housing per inhabitants between two periods and the predictors are the initial cities characteristics. The first column includes in the sample all cities with more than 10 000 inhabitants in 1990 whereas other columns include in the sample cities with more than 100 000 inhabitants in 1990. Standard errors are in parenthesis. The last two rows reports the average and the standard deviation of the outcome variable in the sample. *Sources:* 1968, 1975, 1982, 1990 and 1999 Censuses of Population and 1990 and 1999 Censuses of Housing.

tants. This implies that the public housing supply increased more rapidly in cities with a high initial stock of public housing, which is reflected in the increased standard deviation of public housing supply until 1990 (Table 5). The effect of a left-wing municipality is not statistically significant across regressions and the estimated coefficient is even slightly negative during the period 1982-1990. In any case, the estimated effect of having a left-wing mayor is economically negligible: the estimated coefficient indicates that having a left-wing mayor for 22 years increases the public housing stock per inhabitants by 1.27%, whereas the average increase over the period is 8.3%. This result is not surprising because construction plans were launched by the center right Gaullist government during the 1960s and continued throughout the 1970s under successive center right governments. This suggests that during that period, change in public housing supply were more indicative of local and regional preferences than of partisan political differences.

Existing historical evidence also confirms the absence of links between immigrant housing needs and decisions regarding public housing constructions (Yves Lequin 2006). The French policy of immigrant housing during the 1950s and 1960s consisted primarily of providing housing to single male immigrants in specific public migrant housing, called foyer Sonacotra. The purpose of that policy was to avoid family-based migration of wives and children (Patrick Weil 2005, p.51) and encourage the men to return to their country of origin during periods of economic downturn. As a result, during the 1960s, the housing conditions of many immigrants were very poor; many of them lived in slums around French cities. Lequin (2006, p.410) reports there were 113 slums in the Paris region in 1970. The biggest was La Folie in Nanterre, where 23,000 individuals lived, mostly immigrants from Algeria.

During the 1960s and the beginning of the 1970s, immigrants' access to public housing was severely restricted: in order to be eligible, several public housing agencies required immigrants to first maintain residency for 10 years and to have children (Schor 1996, p.214). The number of immigrants in public housing was also often limited by quotas; in some regions, no more than 6.5% of housing projects could be occupied by immigrants. After 1970, the decision to "tolerate" more immigrants in housing projects was taken to eliminate immigrant slums and the quotas of immigrants in housing projects subsequently increased to 10-20% after

1970 (Weil 2005, p.52). More generally, after the election of the socialist presidency candidate François Mitterrand in 1981, these discriminations declined, which may explain the large increase in the participation rate of some immigrant groups between 1982 and 1999.

## 5 Results

Results of the estimations of the basic model are reported in Tables 8 and 9 per region of origins. Table 8 reports estimates for immigrants from Maghreb. The first columns report the results of models, estimated separately at each census year while the last column reports estimates controlling for location-fixed effects. To save space, Table 9 only includes regressions with fixed effects for other groups. Additional estimates for these groups are available from the author upon request. I first comment on the effect of traditional variables on location choice and then turn to the relative impact of unemployment and public housing.

The first two lines report the effect of two variables controlling for the concentration of similar immigrants. As in Jaeger (2008), the proportion of similar immigrants to city population is always positive and significant, but the share of similar immigrants living in the city is often quantitatively negligible. This suggests that immigrants prefer cities in which similar immigrants make up a larger percentage of the population, rather than large communities in absolute values. The magnitude of the concentration variable is relatively similar across groups of immigrants, being the largest for immigrants from Maghreb and lowest for immigrants from Asia. The sign of the coefficient of the total immigrant share of the population differs across years and groups. The effect is most often negative (for immigrants from Asia and Europe) or negligible (for immigrants from Maghreb), suggesting a decline in the attractiveness of traditional immigrant cities over the period.

Table 8: Determinants of Location Choice 1966-1999: New Immigrants from Maghreb

	(1)	(2)	(3)	(4)	(5)	(6)
Arrival Period	1966-68	1969-75	1975-82	1983-90	1991-99	1966-99
Similar immigrants	0.411	0.424	0.535	0.453	0.451	0.415
share of population	(35.71)	(45.26)	(34.84)	(23.57)	(27.27)	(64.30)
Share of similar	-0.051	-0.007	0.086	0.031	-0.055	-0.041
immigrants in city	(5.72)	(1.06)	(6.81)	(2.03)	(5.34)	(9.32)
Log(Population)	0.944	0.788	0.741	0.74	0.783	1.455
	(57.51)	(70.42)	(37.04)	(30.79)	(53.72)	(16.60)
Immigrants share	0.362	0.127	0.006	-0.046	0.049	-0.058
of population	(20.66)	(9.37)	(0.24)	(1.35)	(2.08)	(3.97)
University Graduates	-0.124	-0.033	-0.190	0.181	0.140	0.048
as pct. of population	(5.54)	(1.95)	(7.21)	(6.01)	(7.17)	(1.43)
Manufacturing	-0.156	0.015	-0.302	-0.165	-0.079	-0.058
share	(5.78)	(0.76)	(12.45)	(5.14)	(3.58)	(1.64)
Unemployment Rate	-0.072	-0.078	0.011	0.015	0.130	-0.048
x Couple with Children	(2.80)	(3.18)	(0.39)	(0.49)	(6.35)	(3.71)
Unemployment Rate	-0.211	-0.150	-0.028	-0.105	-0.047	-0.173
x Others	(13.60)	(11.82)	(1.35)	(3.66)	(1.95)	(16.79)
Public Housing per	-0.021	0.133	0.140	0.183	0.138	0.249
Inhabitants x Couple	(0.52)	(4.44)	(4.17)	(5.40)	(6.32)	(13.53)
Public Housing per	-0.019	-0.014	-0.160	0.084	0.096	0.039
Inhabitants x Others	(0.97)	(0.91)	(6.55)	(2.88)	(3.74)	(2.62)
Fixed Effects						
for Urban Area	No	No	No	No	No	Yes
In couple with children	3 475	3 359	2 526	2 306	5 215	15 065
Other individuals	13 674	21 029	6 673	3 895	4 015	49 286
Number of observations	977 493	1 390 116	524 343	353 457	526 110	3 668 007

*Notes of Table 8:* Estimated via conditional logit. The dependant variable is the location in the Census year. Choice set is 57 cities with more than 100 000 inhabitants in 1990. The predictors are the characteristics of these cities during the census year. t-values are in parenthesis. The sample includes new male immigrants who arrived during the indicated period, aged 16-60 and excludes students and servicemen. Individuals reported as children of a household are excluded. Columns (1) to (5) reports estimates of the determinant of the location choice of new immigrants arrived during the indicated period respectively in 1968, 1975, 1982, 1990 and 1999 across 57 cities. Column (6) reports the estimates of the location choice of new immigrants in 1968, 1975, 1982 and 1990 and controls for location fixed effects. Similar immigrants are immigrants from the same country of birth. All predictors have been standardized to have an average of zero and a standard deviation of one for each individual. See text for details.

*Sources of Table 8:* 1968, 1975, 1982, 1990 and 1999 Censuses of Population and 1990 and 1999 Censuses of Housing.

Table 9: Determinants of Location Choice 1966-1999

	Africa	Asia	Europe	Refugees*
Similar Immigrant share of population	0.352 (50.77)	0.281 (44.7)	0.360 (87.36)	0.373 (14.42)
Share of similar immigrant in city	0.018 (2.47)	0.038 (5.43)	0.010 (2.43)	-0.377 (1.34)
Log(Population)	1.693 (8.41)	2.348 (10.44)	1.104 (12.75)	2.224 (2.23)
Immigrant share of Population	-0.197 (6.4)	-0.238 (7.21)	-0.087 (6.04)	0.144 (0.97)
University Graduates as pct of population	-0.010 (0.13)	-0.143 (1.79)	0.123 (3.59)	0.176 (0.74)
Manufacturing Share	-0.109 (1.28)	-0.763 (9.95)	-0.126 (3.41)	-0.548 (1.53)
Unemployment Rate x Couple with Children	-0.024 (0.79)	-0.392 (12.55)	-0.141 (11.34)	-0.188 (1.19)
Unemployment Rate x Others	-0.082 (3.23)	-0.507 (17.54)	-0.163 (14.21)	-0.459 (2.89)
Nb of Public Housing per Inhabitants x Couple	0.259 (5.27)	0.120 (1.87)	-0.057 (3.27)	0.891 (1.84)
Nb of Public Housing per Inhabitants x Others	0.273 (6.12)	0.113 (1.79)	-0.012 (0.72)	0.812 (1.68)
Fixed Effects for Urban Area	Yes	Yes	Yes	Yes
In couple with children	5 356	8 168	28 173	4 086
Other individuals	15 583	11 734	40 574	5 331
Number of observations	1 193 523	1 134 414	3 918 579	536 769

*Notes and Sources:* See table 8.

\* The time period for the regressions including only refugees is restricted to the arrivals between 1968 and 1990. See text for details.

Population size is also an important determinant of location choice: the log of population size has a strong and positive effect and is significant across regressions. This result confirms that immigrants are more likely to locate to large cities. This parameter is remarkably similar across groups of immigrants. Cities with a large share of population in manufacturing do not appear to be particularly attractive to immigrants. The manufacturing share has a negative effect for immigrants from Maghreb, Asia, Africa and Europe. The effect of the graduate share of the population varies across groups of immigrants. For immigrants from Europe, the effect is positive and significant, while the effect for other groups is negative and not significant. However, this result may reflect the lack of variance of this variable over time. Inspection of the correlation coefficient of the share of graduates across cities over time reveals that educated cities in 1990 were mostly the same as in 1968: the correlation coefficient between the graduate share in 1968 and the graduate share in 1990 is 0.93. Therefore, it may be relatively difficult to identify the effect of the graduate share while simultaneously controlling for city fixed effect. I now discuss the effect of differences in unemployment rates and differences in public housing supply across cities. First, the evidence suggests that immigrants without children strongly prefer cities with a lower unemployment rate.<sup>31</sup> The unemployment rate has a significant negative effect for immigrants without children, which is particularly strong for immigrants from Asia, refugees and Europeans, and it is much smaller for African immigrants. For immigrants living as a couple with children, there is a negative effect of differences in unemployment rates, which is significant in most groups; however, the magnitude of the coefficient is much smaller for immigrants from Maghreb, Africans and refugees. The differences between couples immigrants and others are relatively negligible for immigrants from Asia and Europe.

Turning now to the effects of public housing, cross-section and fixed effects results confirm the hypothesis of a magnetic effect of public housing for all immigrant groups except those from Europe. As expected, immigrants living as a couple with children, who are most likely to be eligible for public housing, respond strongly to differences in public housing across cities but not to differences in unemployment rates. Conversely, immigrants without children respond to

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<sup>31</sup>This results has an important implication for the research on the impact of immigration on the labor market: as emphasized by George J. Borjas, Richard B. Freeman & Lawrence F. Katz (1997) if migrants locate in cities with booming economies, methods using correlations between employment outcome and change in immigration to estimate the impact of immigration will be biased upward.

differences in unemployment across cities but not to public housing. In the case of refugees, I find a relatively large effect of public housing on location choice but given that the time period differs with other regressions, the coefficients are not directly comparable with other groups. I find that the effect of changes in public housing supply on immigrants from Africa and Maghreb is relatively similar, while the effect of public housing on immigrants from Asia appears to be of a lower magnitude and is measured less precisely.<sup>32</sup> The estimated parameters imply that for immigrants from Maghreb and Africa, an increase of one standard deviation in public housing supply increases the probability of choosing the "average" city by 30%.<sup>33</sup>

Table 10 reports regression results from the model described by Equation (7), allowing for a separate effect between new immigrants in public housing and those in private housing (arriving between 1975 and 1999). For convenience, the table only shows the effect of differences in unemployment rates and public housing supply on location choice for individuals in private and public housing. All cohorts of immigrants from 1968-1999 are included in the sample and are used to estimate the fixed effects. Results indicate that location choices of immigrants living in public housing differ from those in private housing and that choices are related to public housing supply. Moreover, while differences in public housing supply across cities have a positive effect on location choice of public housing participants, they have a negative impact on location choice of other immigrants. Quantitatively, results are remarkably similar to the previous regressions: an increase in public housing supply by one standard deviation increases the probability of choosing the "average" city by 20% for European immigrants and up to 30% for immigrants from Maghreb and Africa. The figures also indicate a positive but insignificant effect for Asian immigrants. The effect of differences in unemployment rates on

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<sup>32</sup>However, unreported estimates excluding the year 1999 from the sample reveals that the impact of public housing turns significant for immigrants from Asia and has the same magnitude than for other groups. I suspect this result may be due to the changes in the national composition of the Asian immigrant group over the period because they form a particularly heterogeneous group.

<sup>33</sup>In cross section estimates (partially reported), the effect of public housing in 1968 is not significant for all groups of immigrants, which is not surprising because as described before, immigrants had practically no access to public housing before the 1970s. The magnitude of the coefficient increases until 1999 and is strongly positive and significant for immigrants with children from Maghreb and Africa whereas it is either insignificant or of little quantitative importance for individuals without children from Maghreb. The effect of public housing on European immigrants is either not significant or positive until 1975 and then the effect is slightly negative. This suggests that the share of public housing may be related with undesirable characteristics of the city which are imperfectly absorbed by the controls. In estimates with fixed effects, the coefficient of public housing becomes insignificant which confirm that interpretation.

Table 10: Location Choice Immigrants in Public Housing and in Private Housing 1975-1999

	Maghreb	Africa	Asia	Europe
Unemployment rate x Private Housing	-0.028 (2.09)	-0.113 (3.65)	-0.423 (13.07)	0.004 (0.26)
Public Housing per Inhabitants x Private Housing	-0.139 (4.88)	-0.113 (1.52)	-0.46 (5.54)	-0.305 (10.37)
Unemployment rate x Public Housing	0.092 (5.33)	0.113 (3.04)	0.035 (0.97)	0.224 (9.51)
Public Housing per Inhabitants x Public housing	0.298 (10.23)	0.280 (3.67)	0.096 (1.13)	0.195 (5.57)

*Notes:* The table reports regression results of a conditional logit model of location choice for new immigrants across French urban areas. The first two lines report respectively the estimated effect on the location choice of differences in unemployment rates and public housing supply for new immigrants living in private housing at the time of the census, while the last two lines report the effect of the same variables for new immigrants in public housing. t-values are in parenthesis. The sample includes all new immigrants who arrived between 1966 and 1999. Although not reported, estimations also include all other covariates included in model 6 of Table 9 and 8 and city fixed effects. Predictors have been standardized. See text for details. *Sources:* 1968, 1975, 1982, 1990 and 1999 Censuses of Population and 1990 and 1999 Censuses of Housing.

Table 11: Location Choice of Immigrants and Group Participation Rate in Public Housing 1975-1999

	Maghreb	Africa	Asia	Europe
Unemployment rate x Private Housing	0.011 (0.78)	-0.089 (2.88)	-0.335 (10.23)	0.032 (2.25)
Part. rate of the group x Private housing	-0.304 (15.81)	-0.380 (13.03)	-0.351 (14.34)	-0.294 (18.05)
Unemployment rate x Public Housing	0.099 (5.62)	-0.025 (0.64)	-0.146 (3.67)	0.125 (4.96)
Part. rate of the group x Public Housing	0.454 (20.65)	0.828 (23.20)	0.698 (24.95)	0.580 (21.44)

*Notes:* The table reports regression results of a conditional logit model of location choice for new immigrants across French urban areas. t-values are in parenthesis. The parameters reported concern immigrants who arrived between 1975 and 1999 for whom information on public housing participation is available. The sample includes all new immigrants who arrived between 1968 and 1999. City fixed effects and all other covariates used in the previous regressions are also included and predictors have been standardized. See text for details. *Sources:* 1968, 1975, 1982, 1990 and 1999 Censuses of Population and 1990 and 1999 Censuses of Housing.

location choice is even more striking: while the results indicate a negative effect of differences in unemployment rates for immigrants in private housing, for all groups except Asians, there a positive and significant coefficient for public housing participants (which is particularly large for Europeans and Africans).

On the whole, from both cross-section regressions and regressions including fixed effects, I find relatively robust evidence showing that changes and differences in public housing supply influence the location choices of non-European immigrants. Public housing participants are more likely to choose cities with a large public housing supply and higher unemployment rates than new immigrants living in private housing.

Table 11 presents results using the participation rate of the group in public housing as an explanatory variable. The results confirm the asymmetry between location choices of public housing participants and others. Public housing participants prefer cities in which the participation rate of their national group is important, while this factor has a negative effect on location

choices of private housing participants. Quantitatively, the estimated effect is remarkably large and is measured precisely: an increase of one standard deviation in the participation rate of a group in a given city increases the likelihood of choosing a city by 45% for public housing participants from Maghreb, 82% for Africans and 69% for Asians; this same change decreases the likelihood of choosing that city by 30% for immigrants in private housing from Maghreb, 38% for Africans and 35% for Asians. Interestingly, while we find no impact in differences in public housing supply on European immigrants, differences in public housing participation rates nonetheless have an impact on European immigrants: an increase of one standard deviation of the group participation rate in a city increases the likelihood of choosing a city by 58% for public housing participants while decreasing the same likelihood by 30% for those in private housing.

To check the robustness of these results, I estimated models in which turnover rates in public housing are used instead of the stock of public housing to evaluate differences in housing supply. Turnover rates are calculated by dividing the number of public housing units among households who were absent during the previous census over the total city population. Given that information on public housing participation is needed in order to compute turnover rates, only censuses after 1975 can be used. Results are displayed in Table 12. Results are broadly similar to those in Table 10, except that the effect of differences in the public housing supply on Asians is now negative and significant. The negative impact of differences in turnover rates is larger for most groups of immigrants living in private housing (except Africans) as compared with estimates using only the stock of public housing.

Data on rents and housing prices at the city level is not available during the entire chosen time period. However, it is possible to find data for the 1990s on average housing costs across cities. I include these figures in the regression controls for housing costs by using the average housing cost of main municipalities of the urban areas.<sup>34</sup> One implication of the theoretical model of spatial arbitrage is that differences in housing costs are compensated by higher wages and should not be significant in regressions once controls for economic opportunities are added.

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<sup>34</sup>As an index of housing cost, I use the rent index computed by Clameur, a French private research institute on housing markets, for the housing costs of a main municipality. This data is publicly available on their website: [www.clameur.fr](http://www.clameur.fr).

Table 12: Location Choice of Immigrants using Turnover Rates in Public Housing 1975-1999

	Maghreb	Africa	Asia	Europe
Unemployment rate	0.032	-0.120	-0.222	0.088
x Private Housing	(2.18)	(3.49)	(5.99)	(5.67)
Turnover Rates in Pub H.	-0.345	-0.071	-0.859	-0.491
x Private Housing	(13.12)	(1.18)	(13.93)	(19.16)
Unemployment rate x	0.142	0.090	0.207	0.280
Public Housing	(7.8)	(2.27)	(5.03)	(11.51)
Turnover Rates in Pub H. x	0.142	0.377	-0.266	0.086
Public Housing	(5.26)	(5.98)	(4.17)	(2.68)

*Notes:* The table reports regression results of a conditional logit model of location choice for new immigrants across French urban areas. The sample includes all new immigrants who arrived between 1968 and 1999. t-values are in parenthesis. City fixed effects and all other covariates used in previous regressions are also included and predictors have been standardized. The first and last two lines report the impact of differences in unemployment rates and turnover rates in public housing on respectively public and private housing participants who arrived between 1975 and 1999. *Sources:* 1968, 1975, 1982, 1990 and 1999 Censuses of Population and 1990 and 1999 Censuses of Housing.

Table 13 confirms this hypothesis for regressions in 1999. In most regressions, differences in housing cost are insignificant or economically negligible for most immigrant groups. Moreover, controlling for differences in housing costs across cities does not affect parameters of public housing on the regression.

## 6 Conclusion

This paper studied the location choices of new immigrants in France during 1968-1999. Using different specifications and a 30-year time period, the study finds relatively robust evidence that the availability of public housing influences the location choices of non-European immigrants. Public housing participants tend to choose cities with a relatively higher supply of public housing, but there is a conversely negative effect on the location choices of immigrants living in private housing. Similarly, cities in which some groups have a particularly high participation rate in public housing are attractive to public housing participants, while these participation

Table 13: Location Choice in 1999 including controls for Housing Costs

Arrival Period 90-99 / 51 cities	Maghreb	Africa	Asia	Europe
Nb of Public Housing per Inhabitants x Couple	0.202 (8.04)	0.099 (2.02)	0.107 (2.87)	-0.063 (2.09)
Nb of Public Housing per Inhabitants x Others	0.147 (4.71)	0.175 (4.33)	0.044 (1.06)	-0.06 (2.25)
Av. Rent x Couple	-0.019 (0.64)	-0.002 (0.04)	-0.082 (1.83)	-0.009 (0.28)
Av. Rent x Others	-0.017 (0.50)	0.077 (1.58)	-0.119 (2.55)	-0.079 (2.78)
Number of individuals in couple with children	2 697	713	1 233	2 044
Number of other individuals	1 771	1 046	1 005	2 718
Number of observations	227 868	89 709	114 138	242 862

*Notes:* The table reports regression results of a model of location choice of new immigrants in 1999 across 51 cities for which data on housing cost was available. t-values are in parenthesis. All other covariates used in previous regressions are also included and predictors have been standardized. See text for details. *Sources:* 1999 Census of Population and 1999 Census of Housing. Data on housing costs from *Clameur*.

rates have a strong negative effect on immigrants in private housing.

The implications of these results in terms of public policy are nonetheless ambiguous. On one hand, public housing seems to attract immigrants in cities with few economic opportunities. In these cities, immigrants are more likely to be unemployed and to live on welfare, which is a non-negligible risk because the unemployment rate of immigrants in France is double that of natives. On the other hand, public housing may also have diminished the incentives to live in ethnic "ghettos," where they benefit from social networks and social ties but are isolated from the rest of the population. In some sense, public housing may have paradoxically facilitated immigrants' assimilation by preventing the formation of ethnic clusters at the cost of increasing the welfare dependency of immigrants. More research is needed to fully understand the implications of different segregation patterns that are produced by public housing in France.

Another striking observation that deserves more research is the reason that the impact of public housing on immigrants differs so widely between European and non-European immigrants and between immigrants and natives. It remains to be explored whether the overrepresentation of

non-European immigrants in public housing is due to specific financial constraints, discrimination in the housing market, or a low supply of cheap housing for families in the French housing market.

## Appendix

### 6.1 Interpretation of parameters of conditional logit with standardized variables

In this section, I show that the parameters of a conditional logit where the predictors have been standardized such that the variables of the choice set of each individual have an average of zero and a variance of one have a simple and intuitive interpretation. See Andrew Gelman (2008) for a more general discussion on the interest of scaling predictors of regressions model.

Suppose the true model is given by equation (5). Denote by  $z_j^k = \frac{x_j^k - \bar{x}^k}{\sigma_{x^k}}$  the standardized variable of the predictor  $k$  of alternative  $j$ ;  $\bar{x}^k$  and  $\sigma_{x^k}$  respectively the average and the standard deviation of the predictor  $k$  over the initial choice set. Since only differences in utility matters (Kenneth Train 2003, p.23), the model described by (5) can be rewritten as:

$$ZU_{i,j} = z_{i,j}\gamma + \epsilon_{ij}$$

This model is similar to the model described by equation (5) and the relation between  $\beta$  and the  $\gamma$  is simply given by  $\beta_k = \frac{\gamma_k}{\sigma_{x^k}}$  for all predictor  $k$ .

Let me add two alternatives to the choice set. The first is the ‘average’ city for which the characteristics are equal to the average of the  $J$  preexisting alternatives. The second is identical to the ‘average’ city except that the characteristic  $l$  is equal to the average plus one standard deviation. When the predictors have been standardized, the characteristics of the average city are a vector of zero whereas the vector of characteristics of the other alternative  $z$  is  $z^l = 1$  and  $z^k = 0$  for  $\forall k \neq l$ . The probability  $P$  of the average alternative is equal to  $P = \frac{1}{1 + \exp(\gamma_l) + \sum_j \exp(z_j \gamma)}$  whereas the probability  $P_l$  for the other alternative is  $P_l = \frac{\exp(\gamma_l)}{1 + \exp(\gamma_l) + \sum_j \exp(z_j \gamma)}$ . If it straight-

forward to derive that  $\frac{P_l}{P} = \exp(\gamma_l)$  which implies that:

$$\log P_l - \log P = \gamma_l \quad (8)$$

The previous expression indicates that the parameter  $\gamma_l$  is equal to the log difference between the probability of the ‘average’ city and the probability of the ‘new’ city when both cities are included in the choice set. Note that the relationship between  $\beta_l$  and  $\gamma_l$  is a function of the variance  $\sigma_{x^l}$  and therefore  $\gamma_l$  is a function of the initial alternatives included in the choice set and used to standardize the variables.

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