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Lessons and Challenges from Non-European Immigration in France

Gregory Verdugo, Sorana Toma

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ABSTRACT

Recent decades have seen a rapid increase in the share of non-European immigrants in public housing in Europe, which has led to concern regarding the rise of "ghettos" in large cities. Using French census data over three decades, we examine how this increase in public housing participation has affected segregation. While segregation levels have increased moderately on average, the number of immigrant enclaves has grown. The growth of enclaves is being driven by the large increase in non-European immigrants in the census tracts where the largest housing projects are located, both in the housing projects and the surrounding non-public dwellings. As a result, contemporary differences in segregation levels across metropolitan areas are being shaped by the concentration of public housing within cities, in particular the share of non-European immigrants in large housing projects constructed before the 1980s. Nevertheless, the overall effect of public housing on segregation has been ambiguous. While large projects have increased segregation, the inflows of non-European immigrants into small projects have brought many immigrants into census tracts where they have previously been rare and, thus, diminished segregation levels.

KEY WORDS

JEL

Can Public Housing Decrease Segregation? Lessons and Challenges from Non-European Immigration in France[1]

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Abstract

Recent decades have seen a rapid increase in the share of non-European immigrants in public housing in Europe, which has led to concern regarding the rise of "ghettos" in large cities. Using French census data over three decades, we examine how this increase in public housing participation has affected segregation. While segregation levels have increased moderately on average, the number of immigrant enclaves has grown. The growth of enclaves is being driven by the large increase in non-European immigrants in the census tracts where the largest housing projects are located, both in the housing projects and the surrounding non-public dwellings. As a result, contemporary differences in segregation levels across metropolitan areas are being shaped by the concentration of public housing within cities, in particular the share of non-European immigrants in large housing projects constructed before the 1980s. Nevertheless, the overall effect of public housing on segregation has been ambiguous. While large projects have increased segregation, the inflows of non-European immigrants into small projects have brought many immigrants into census tracts where they have previously been rare and, thus, diminished segregation levels.

I. Introduction

The rise of non-European immigration in recent decades has greatly diversified the population in European countries (Koopmans et al. 2005). In 2010, the population born outside the European Union represented, on average, 8% of the population in these countries (Vasileva 2011). In contrast with the intra-European migration that has long prevailed in Europe, non-European immigrants encounter substantial barriers in the labor markets that are associated with higher levels of residential segregation.[4] Furthermore, a large and increasing share of non-European immigrants live in public housing, the impact of which on segregation levels is under-studied.

In this paper, we use restricted access census data over the last three decades in France to document how the growth of the non-European immigrant population in public housing has affected the immigrants' spatial segregation. France is an interesting country to study with regard to these questions because its non-European population is large, diverse, and growing rapidly. Between 1968 and 2012, the share of non-European immigrants in the population multiplied by four, at first fueled by immigration from Maghreb[5] and, increasingly since the 1980s, by immigration from Sub-Saharan Africa and Asia.

While explanations of residential segregation mainly focus on group differences in human capital, discrimination, and residential preferences (Crowder and Krysan, 2016), the role of the structure of housing markets, in particular large-scale public housing policies, in shaping

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[4] See e.g. (Glitz 2014; Moraga, Ferrer-Carbonell, and Saitz 2015; Musterd 2005; Préteceille 2009; Quillian and Lagrange 2016; Safi 2009; Tammaru et al. 2016).

[5] The Maghreb is a North-African region that includes Algeria, Morocco, Tunisia, Libya, and Mauritania.

residential options has received less attention. According to Table 1, in 2006, public housing accounted for more than 35% of the total housing stock in the Netherlands, 25% in Austria, 21% in Denmark, and approximately 18% in both England and France. While they remain far from being the majority of inhabitants in most housing projects, immigrants have disproportionately settled into public housing in recent years. Table 1 shows that 60% of immigrants in Denmark live in public housing, while the figure is 51% in the Netherlands, 30% in France, and 28% in England. In France, as we document below, approximately 41% of non-European immigrants lived in public housing in 2012, which was up from 30% in 1982.

We conjecture that, in the French and, more generally, the European context, the influence of public housing on residential segregation might be a priori ambiguous. Europe is characterized by a very large supply of public housing where a relatively diverse population resides. While somewhat over-represented in the largest projects, immigrants are otherwise present in all segments of the public housing sector. We hypothesize that an increase in the number of immigrants in small and dispersed housing projects might *decrease* segregation if these projects were located in more diverse neighborhoods. In contrast, a rising concentration of immigrants in the largest projects might *increase* segregation if it reinforced the homogeneity of the neighborhood. This would be more likely to happen if, at the same time, natives either leave or avoid the surrounding private housing dwellings in the neighborhood in response to inflows of immigrants in the projects.

We test these hypotheses using two different levels of aggregation: first, we investigate how the share of immigrants in housing projects of different sizes has shaped the dissimilarity and isolation indices of non-European immigrants at the metro area level. Consistent with our hypotheses, we find that the effect of public housing on segregation depends largely on the share

of immigrants in the largest housing projects, even when differences in socio-economic characteristics of non-European immigrants across cities are accounted for. While the share of non-European immigrants in small projects does not affect segregation levels, a similar share in large projects is associated with dramatically higher segregation levels and, in particular, a high concentration of immigrants in enclaves.

Second, at the neighborhood level, we trace how inflows of immigrants across cities have affected the population within housing projects of different sizes and the population in private housing next to these projects. As differences in immigrant inflows across cities might be driven to some extent by the local availability of public housing (Verdugo 2016), we use an instrumental variable based on ethnic networks to deal with the immigrants' endogeneity (Card 2001). We find that the increase in the share of non-European immigrants has been relatively evenly spread across public housing projects within the metro areas. In contrast, we find the progression of non-Europeans *in private housing* to be three times larger next to the largest projects than next to the smaller-scale projects. Overall, we interpret our findings as evidence that small-scale public housing projects have enabled non-European immigrants to enter neighborhoods where they were previously rare, thereby potentially decreasing segregation. At the same time, the disproportionate growth of the immigrant population both *within* large public housing projects as well as *around* them explains the rise of immigrant enclaves.

One important limitation of our study is that we cannot include second-generation immigrants in the analysis, as they cannot be identified in the Census data when they do not live with their parents. Also, the data do not contain any variable to measure segregation along either

racial or ethnic lines. In 2015, second-generation immigrants of non-European origins[6] accounted for 6% of the population, compared with 5.3% for the first generation (Brutel 2017). However, since half of them live with their parents, the share of second-generation non-European immigrants that we cannot identify accounts for 3% of the population. Clearly, excluding them from the analysis underestimates segregation indices along "ethnic lines".

II. Theoretical background

Three main theoretical models have been put forward to explain the residential segregation of immigrants and minorities: spatial assimilation, place stratification, and racial residential preferences (Charles 2003; Crowder and Krysan 2016). These models were developed and tested in the North American context (Crowder, Pais, and South 2012; Iceland and Scopilliti 2008; Iceland and Wilkes 2006; Logan, Zhang, and Alba 2002; Logan, Stults, and Farley 2004; Logan and Alba 1993; South, Crowder, and Pais 2008; Wagmiller, Gage-Bouchard, and Karraker 2017); however, they have only recently been examined in Europe (Bolt, van Kempen, and van Ham 2008; Friedrichs 1998; Glitz 2014; Mcavay 2016; Pan Ké Shon and Verdugo 2014; Musterd 2005; Musterd and Ostendorf 2009; Pan Ké Shon and Verdugo 2015; Peach 1996; Rathelot and Safi 2014; Schönwälder and Söhn 2009; Simpson and Finney 2009).

The spatial assimilation model (Alba and Logan 1993; Massey and Denton 1985) predicts that, as immigrants and their descendants experience acculturation and upward socio-economic mobility, they gradually move out of concentrated areas and into more diverse neighborhoods. Neighborhoods of high immigrant concentration—termed immigrant enclaves—

[6] They are defined as having at least one immigrant parent from non-European origins.

are, thus, conceptualized as port-of-entry types of neighborhoods and transitory along immigrants' residential trajectories.

To explain the persistence of segregation, proponents of the place stratification model (Logan, 1978; Logan and Molotch, 1987) have emphasized the role of prejudice and discrimination (Massey and Denton 1985; Yinger 1995) as well as racial residential preferences (Boschman and van Ham 2015; Krysan et al. 2009; Krysan and Farley 2002). High and persistent levels of segregation may reflect discriminatory practices in the private housing market by real estate agents and landlords (Ross and Turner 2005). White tenants might also flee neighborhoods in response to immigrant concentration—a phenomenon called "white flight" (Bobo and Zubrinsky 1996; Hall and Crowder 2014)—or avoid moving into multi-ethnic neighborhoods—the so-called "white avoidance" (Andersson 2013; Bråmå 2006). Immigrants might also prefer neighborhoods with a higher share of co-ethnics (McAvay 2018; Rathelot and Safi 2014; Vigdor 2003), while natives might prefer living in homogenous neighborhoods that enable the reproduction of their institutional and cultural capital (Bacqué et al. 2015; Bridge 2006; Bridge, Butler, and Lees 2012; Butler and Robson 2001).

A notable difference between the US and France is the high prevalence of public housing in the latter. Recent work suggests that the large public housing sector in France might distribute immigrants across a wider range of neighborhoods, without concern for their origin (Algan, Hémet, and Laitin 2016; Kesteloot and Cortie 1998; Oberti and Préteceille 2016; Quillian and Lagrange 2016), thereby potentially decreasing their segregation. However, prior research raises some doubts with respect to the desegregation potential of public housing in Europe. In an important paper, Musterd and Deurloo (1997) argue that ethnic segregation may develop within the public housing sector in Amsterdam, and that as a result, its large public sector might not

prevent the increase in segregation. In France, qualitative research finds evidence of discriminatory practices from public housing authorities in the allocation of immigrants across housing projects (Bourgeois 2013; Masclet 2006; Sala Pala 2005; Tissot 2006).

Even if one assumes that the objectives of housing authorities are to diminish segregation, Schmutz (2013) theoretically demonstrates that their ability to do so is constrained by the responses of the inhabitants of private housing. A disproportionate increase in the share of immigrants who live in large housing projects may deter natives and attract immigrants in private housing in the neighborhood, which reinforces the homogeneity of the neighborhood and increases segregation. In contrast, the progression of immigration in small projects might not change the composition of private housing as long as the share of minorities remains small.

Based on this discussion, we draw two main hypotheses that we test empirically in the paper:

H1: First, we examine the extent to which differences in segregation levels across French cities are related to differences in the share of non-European immigrants in housing projects of different sizes, accounting for differences in their socio-economic characteristics. More precisely, we expect that, while a larger proportion of non-European immigrants in large projects will increase segregation, their presence in small projects will either have no influence or decrease segregation.

H2: Second, we examine *how* differences in the allocation of households across public housing projects and the responses of households in the private housing sector contribute to rising segregation and to the growth of enclaves. We expect census tracts with large housing projects to attract higher inflows of non-European migrants, not only in the public housing sector but also in the private housing sector.

III. Data and methods

The empirical analysis exploits restricted-access data from the French Census over three decades using the 1982, 1990, 1999, and 2012 census years. We use individual files that contain information on location and nationality at the census block level (approximately 500 inhabitants) for each census year. We had access to 25% sample extracts for almost all of the years. These large samples allow us to measure precisely the composition of the population across neighborhoods in both private and public sector housing. An immigrant is defined as a person who is born abroad without being of French nationality at birth; thus, this includes foreigners and naturalized immigrants. We classify immigrants using the country of birth and focus on non-Europeans because the segregation levels of European immigrants are low and declining (Pan Ké Shon and Verdugo 2014; Préteceille 2009). Finally, while the census contains detailed information on labor force status and occupation, it does not include any measure of income.

We follow Quillian and Lagrange (2016) by using "metro areas" as the local unit of analysis. Defined by the French statistical institute, they consist of a set of municipalities characterized by a continuous built-up area.[7] To ensure comparability over time, we fix the boundaries of metro areas using their definition in the 1999 census.

We measure segregation and change in neighborhood characteristics at the level of the French equivalent of the census tract, the "*Ilots Regroupés pour l'Information Statistique*" (IRIS). The IRIS is a socio-spatial division that was introduced by the French statistical institute with the 1999 census. IRISs are half the size of average US census tracts, and they delineate geographic areas with an average of 2,500 inhabitants, following natural boundaries such as

[7] This corresponds to the definition of "*unités urbaines*."

major streets, railway lines and watercourses. For the 1982 census, we use information at the census block level to recover the IRISs.[8] Pan-Ké-Shon and Verdugo (2015) demonstrate that using such "pseudo-IRISs" instead of actual IRISs has little effect on the measurement of segregation. For simplicity's sake, we refer to the IRIS as census tracts in the rest of the paper.

Following Cutler et al. (2008) and several studies, we measure segregation at the census tract level through two standard indices—dissimilarity and isolation—which capture two crucial dimensions of segregation—evenness and exposure (Massey and Denton 1988). The formula of these indices is reproduced in the online Appendix. The index of dissimilarity indicates the proportion of immigrants from a particular group who would need to change residence for each census tract to have the same percentage of their group as does the metropolitan area overall. The index of isolation follows Bell (1954) and measures how exposed immigrants from a group are to one other, rather than to other members.[9] The standard interpretation of this index is that it captures the probability that a randomly chosen immigrant in the census tract will next meet another (randomly chosen) immigrant from the same group.

One important difference between these indices is that the dissimilarity index is 'composition invariant', as it does not change when the proportion of natives or immigrants changes uniformly in all census tracts. In contrast, the isolation index cannot have a value lower

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[8] We constructed "pseudo-IRISs" by aggregating contiguous census blocks to create a zone with a population of approximately 2,500 inhabitants. For the 1990 Census, we use a correspondence table provided by the French statistical institute that aggregates census blocks into IRISs.

[9] The index is the weighted average of each immigrant proportion in the population of each census tract, weighted by the number of immigrants in each tract.

than the share of the group in the population. As a result, longitudinal changes in isolation indices might be difficult to interpret when the share of the group in the population increases over time, which is what we observe for non-European immigrants. To deal with this issue, we report the adjusted isolation index Eta^2, proposed by Massey and Denton (1988) and White (1986), which normalizes the isolation index with the contemporary share of the group in the population. As for the dissimilarity index, this adjusted index is always between zero and one.[10]

Following Cutler et al. (2008), all indices of segregation are calculated with respect to all non-group members, which includes not only natives but also other immigrant groups. Furthermore, the indices are estimated using only the population of heads of households[11] to avoid the risk that the segregation indices of immigrants might be lowered by the presence of the children of immigrants in the household. This implies that our indices are not influenced by second-generation immigrants who live with their parents and who account for 3% of the population.

IV. Basic facts on public housing

Public or social housing, as it is called in Europe, is the provision by the state of housing at a price lower than the market rent through either housing authorities, municipalities, or

[10] The adjusted isolation index Eta^2 is equal to zero when the share of immigrants is similar in all census tracts *and* corresponds to their share in the population; it equals one when immigrants are only found in census tracts without any non-members.

[11] We categorize a household as immigrant if the head of household is an immigrant.

independent organizations, such as housing associations (Andrews, Sánchez, and Johansson 2011).[12]

The first public housing programs followed the Great depression in the US (Stoloff 2004) and the Second World War in Europe (Harloe 1995, 210). Their initial ambition was not only to eliminate urban slums but to improve the housing conditions of a large share of the population. Over time, two main models emerged (Andrews, Sánchez, and Johansson 2011). The first is a 'broad based' or 'universal' model that characterizes some Scandinavian and northern European countries, such as France and the Netherlands. In that model, public housing aims to cover a large and diverse population, and a large supply ensures its accessibility (Scanlon, Whitehead, and Arrigoitia 2014). In a second 'targeted' or 'residual' model, public housing is also highly subsidized but strictly means-tested, small in scale and often stigmatized. This residual model is common to welfare liberal regimes, such as Australia, the US, and, increasingly, the UK (Scanlon, Whitehead, and Arrigoitia 2014).[13]

Because the scale and the composition of inhabitants differ widely, each model has quite different consequences for the segregation of immigrants and minorities. In the residual model, public housing rapidly concentrated impoverished minorities (see, e.g., Hunt (2009)). However,

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[12] In many countries, but not France, the private sector is increasingly involved in social housing through public and private partnership in development and ownership (Whitehead and Scanlon 2007, 12–13).

[13] Kemeny's (1995; 2001; 2006) distinction between a dualist rental market and a unitary or integrated rental market is similar in many respects, while placing more emphasis on the degree of competition between the not-for-profit (public) system and the for-profit private market.

with less than 1% of households living in public housing in 2017 in the US,[14] public housing has very little influence on average segregation in the US compared with Europe.

French public housing in practice

The French public housing system distinguishes three categories of dwellings by the maximum household income at entry and the rent that has to be paid. The category depends on the construction date and the type of financial aid received from the central government during the construction, so it cannot be changed.[15] The eligibility thresholds are similar across France; except in the Paris region, where they are higher. Approximately 55% of households are eligible for the standard public housing category that includes approximately 86% of the dwelling stock (INSEE, 2017, p.126). [16] When the high-threshold category (PLS/PLI) that accounts for 9% of the stock is included, the share of eligible households increases to 72%. A third category of low-income public housing (PLAI) accounts for 5% of the stock and approximately 23% of low-income households are eligible.

To preserve the social mix, households are allowed to stay if their income increases and exceeds the initial threshold, but they have to pay a modest extra amount of rent. As a result,

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[14] According to figures from the US department of Housing and Urban Development. See https://portal.hud.gov/hudportal/HUD?src=/program_offices/public_indian_housing/programs/ph (accessed 14th April 2017)

[15] That categorization is not reported in the census data, but we have information on the construction year.

[16] The standard category (PLUS) includes all units constructed before 1977 and 74% of units constructed after (Guillon 2017, 11).

30% of public housing inhabitants have an income level above the median, and 10% have an income level in the highest income quartile (Laferrère 2011, 236).

While it has been marginally reformed several times, the allocation process remains decentralized at the local level. Dwellings are managed by one of the 755 local housing authorities that are controlled by local government, either the municipality or the county. Eligible families can apply through any municipality, regardless of their current location. For immigrants, the only requirement is to be legally living in France (as a naturalized citizen or with a valid residence permit).[17] In the context of a chronic housing shortage in large metro areas, the number of applicants for public housing has been increasing constantly, with working class background, social networks, and housing difficulties being among the main drivers of demand (Dietrich-Ragon 2013).

Following their application, families are put on a waiting list. Their rank depends on their household characteristics, as priority is given to households that have members either with disabilities or who are victims of conjugal violence. Housing authorities might not strictly follow the waiting list as they attempt to preserve the "social mix" across their projects (Simon 2003) , which results in longer waiting times for immigrants (Bonnal, Boumahdi, and Favard 2013). Because it is not possible to apply to a particular dwelling or housing project, offers of housing are often refused, and the rank in the waiting list is lost. In 2013, approximately 24% of households who arrived in public housing in the previous four years had refused an offer

[17] This was not always the case, as, until the mid-1970s, immigrants were discriminated against to discourage family-based migration and to avoid their concentration in the housing projects (Schor 1996, 214; Stébé 2013, 106; Weil 2005).

previously (INSEE 2017, 126). In approximately 50% of cases, the refusal was motivated by the characteristics of the neighborhood.

V. Immigration and public housing

The objectives of diversity and social mix in the French public housing sector have been challenged by the increase in non-European immigration and their over-representation in the public housing sector. Panel A in Table 2 shows that, while the share of immigrants has been stable until the 2000s[18], non-Europeans have progressively become the majority of immigrants since 1982. Compared with natives, while a similar share of non-European immigrants are university graduates, a larger share did not graduate from high school (see online Appendix Table A1).

Panel B shows that, in the last decades, non-European immigrants increasingly concentrated in public housing. While the proportion of native households that live in public housing remained at the 13% level, for non-European immigrant households that proportion increased from 30% to 41% from 1982 to 2012. This increase is even larger for immigrants from Maghreb and sub-Saharan Africa, as almost half lived in public housing in 2012, which is up from 33% and 26%, respectively, in 1982.

The data also suggests that public housing may not be just a temporary step in the residential trajectory of non-European immigrants. According to the 2012 census, the probability

[18] The stability of immigration is explained by the decrease in the population of older European immigrants who arrived before the 1930s that was compensated for by the increase of non-European immigration.

to be observed in public housing does not diminish with the length of stay in the host country (online Appendix Table A1).[19]

However, even if immigrants are overrepresented, they remain far from being the majority of the inhabitants in most housing projects (Musterd 2014). In Table 1, the share of immigrants among the population in public housing is less than 30% in all the countries represented. In France, according to Panel C in Table 2, non-European immigrants accounted for only 18% of heads of households in public housing, on average, in 2012.

How concentrated are public housing units across neighborhoods?

The consequences of the inflows of non-European immigrants into public housing depend on the spatial distribution of public housing within metro areas. We show the indices of dissimilarity and isolation of households in public housing in Table 3. These indices have been estimated using all other households as a comparison group. Both the dissimilarity and isolation of public housing inhabitants declined by 7 p.p. and 4 p.p., which suggests that recent constructions contributed to decreasing the concentration.[20] Panel C shows that there are large differences in the segregation of public housing inhabitants across metro areas. For example, the dissimilarity level of public housing inhabitants in Marseille was 61% in 2012, which is 10 p.p. and 5 p.p. higher than in Lyon and Paris, respectively. However, with indices superior to 50% for

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[19] These cross-sectional differences must be interpreted with caution because they also reflect differences in cohort characteristics (Borjas 1985) and are affected by return migration that changes the composition of cohorts over time (Dustmann 2003).

[20] With the exception of urban renewal programs, few public housing projects were demolished over that period.

dissimilarity and 40% for isolation, the segregation of public housing households remains important.

In Table 4, we classify census tracts in four groups using quartiles of the distribution of the share of inhabitants in public housing in the census tract. Throughout the paper, we define as a "*large*" housing project a project in the last quartile, where more than 37% of the inhabitants in the census tracts live in public housing. Panel A in Table 4 shows that 63% of non-European households in public housing live in a large project, compared with 47% of households in the general population. There are also large disparities across metro areas in the share of the population in large projects. In Paris, 70% of non-European households in public housing are living in large housing projects, while that figure is only 56% in Lyon.

Consistent with the decrease in public housing concentration observed in recent years, Panel B shows that approximately 80% of large housing projects were constructed before 1981. On the other hand, only 41% of small housing projects in census tracts where less than 5% of households live in public housing were constructed before that date.

VI. Patterns of immigrant segregation 1982 to 2012

Tables 5 and 6 present the evolution of the segregation of non-European immigrants in major French metro areas from 1982 to 2012, measured by dissimilarity and isolation indices of the group relative to other individuals, that is, including natives and immigrants from other groups. In the first rows, following Cutler et al. (2008), we report the average of the indices using the number of non-European immigrants per metro area as weights.[21] For comparison, the average

[21] We include only metro areas with a population of non-European migrants larger than 500 individuals.

dissimilarity level of European immigrants is reported in the second row. Clearly, the results in Table 5 indicate that non-European immigrants tend to be more segregated. In 2012, the average dissimilarity level was 34% for non-Europeans, against only 17% for European immigrants. These levels are moderate with respect to the US: Iceland and Scopilliti (2008) report dissimilarity indices of 44% for foreign-born people and of 60% for foreign-born Hispanics with respect to white natives in 2000.[22]

An important result is that, in spite of the growth of the non-European population and its inflows into public housing, the average dissimilarity indices increased by only 1 p.p. over this thirty-year period. Panel B shows considerable disparities in segregation trends and levels across metro areas. In 2012, the dissimilarity indices were close to 33% in Paris and Nice, while they were higher by 8 p.p. in Marseille and Lille. From 1982 to 2012, while the dissimilarity levels declined in Nantes and Douai by 5 and 7 p.p., they increased by 5 p.p. in Lyon and Marseilles and by 12 p.p. in Nice (albeit from a low level in the latter case).

Table 6 further reports the isolation indices across metro areas. Reflecting the growth in the non-European population to some extent, the isolation indices increased in the last thirty

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[22] A limitation of these comparisons is that the size of French census tracts is two times lower than the size of US census tracts. Quillian and Lagrange (2016) demonstrate that, as a consequence of these differences in scale, segregation measures are inflated in France in comparison with the US. Another issue is that our dissimilarity indices are calculated using all non-group members instead of white natives. While we cannot use white natives as a comparison group, we calculated dissimilarity indices using native households and found that this only marginally changed the indices.

years. In Paris and Lyon, the indices increased by 12 and 9 p.p., respectively. In Montpellier, the index has doubled. These levels are large, given that the share of non-European households in the French population was 6.4% in 2012.

As discussed before, the unadjusted isolation indices are affected by the size of the group in the population. To account for the growth of the non-European immigrants in the population, the last two columns of Table 6 show the Eta^2 indices in 1982 and 2012 that adjust the isolation index using the proportions of non-European households in the metro area population. The results indicate that the increase in isolation cannot be totally explained by the increase in the proportion of the population with non-European origins. The adjusted isolation levels were between 3% and 10% in 2012, and they increased on average by 4 p.p. over the period. Such an increase is substantial but not massive.

Rise of immigrant enclaves

The finding that segregation has remained moderate in the last several decades might surprise the readers of ethnographic accounts which alerted to the formation of "urban ghettos" since the early 1990s (Delarue 1991; Dubet 1987; Lapeyronnie 2008; Lepoutre 2001). Most of these works describe life in segregated housing projects as being plagued by poverty and as places where the majority of the population is of immigrant origin. Clearly, the previous figures indicate that such situations are far from representative of the census tracts where most immigrants live. However, the indices of dissimilarity and isolation are averages of very diverse census tracts that do not effectively capture what occurs at the tails of the distribution. As demonstrated by Bell and Machin (2013), in the case of the UK, and Préteceille (2009), for France, stable dissimilarity indices can hide an increase in the number of high immigrant census tracts if the growth of the latter is mitigated by the diffusion of immigration in tracts where they were previously rare.

Panel A of Table 7 shows the distribution of census tracts with varying proportions of immigrants in their population, while Panel B shows the distribution of non-European immigrants across these types of tracts. The figures show considerable changes in the proportions of the census tracts with both very few and with many immigrants. First, the proportion of census tracts with less than 1% of immigrants declined rapidly, which clearly contributed to decreasing the segregation levels. For 2012, it is basically impossible to find a census tract with either no or very few immigrants in the population. At the opposite tail of the distribution, the proportion of tracts where more than 30% of household heads are immigrants—tracts that we refer to as 'immigrant enclaves', following Wilson and Portes (1980) and Logan et al (2002)—increased threefold (from 2.5% to 7.9% of all tracts). Furthermore, in 2012, approximately one-third of non-European households lived in these high immigrant census tracts, up from 11.7% in 1982.

The enclaves have not only grown since the 1980s but are also quite different from the enclaves of 30 years earlier. First, the enclaves are increasingly tied to the presence of large housing projects: among those who live in an immigrant enclave, the median proportion of inhabitants in public housing was 50% in 2012 against 15% in 1982. Second, a substantial fraction of enclaves is plagued by high unemployment rates: the unemployment rate of prime age non-European heads of households in enclaves increased by 10 p.p. from 14% to 24%, on average, from 1982 to 2012.

VII. How do variations in metro-area segregation levels relate to public housing?

In this section, we investigate the extent to which, relative to other factors, characteristics of public housing predict differences in metro-area segregation levels of non-European immigrants. Disentangling the role of different factors is important, as cities with a higher share of public

housing might attract immigrants with lower socio-economic status. If this is the case, higher segregation levels in these cities might reflect, to a large extent, differences in the characteristics of immigrants and not the consequences of their concentration in public housing. Empirically, we follow Iceland and Scopilliti (2008) and Cutler et al. (2008), among others, and use regression models at the metro area level. We consider the following specification:

$$S_{lt} = SPH_{lt}\beta_1 + \text{small}PH_{lt}\beta_2 + \text{large}PH_{lt}\beta_3 + \mathrm{X}'_{lt}\gamma + \mathrm{Z}'_{lt}\phi + u_{lt} \quad (1)$$

where S_{lt} is a segregation index, dissimilarity or isolation, for non-European immigrants in metro area l and census year t, SPH_{lt} is the same segregation index but estimated by comparing the distribution of households in public housing relative to those in the private sector housing, and the variables $\text{large}PH_{lt}$ and $\text{small}PH_{lt}$ report the share of non-European immigrants that lives in large and small housing projects in the metro area relative to their share in the private sector housing. As previously, large (small) housing projects are defined as housing projects that account for more (less) than 37% of the census tract population. Differences between β_2 and β_3 capture the difference in the effect on segregation between the share of non-European immigrants in large versus small housing projects.

The vector X_{lt} accounts for the differences in the composition of non-European immigrants across metro areas and includes the share of managers, blue-collar workers, and unemployed workers among the heads of households of the group, the share of the group in the metro area population, the share of the group that arrived since the last census and, after 1999, the average length of stay of the group in France. The vector Z_{lt} includes the metro areas' characteristics that have been shown to influence segregation in other studies (Pais, South, and Crowder 2012). It contains the log of the population, the share of immigrants in the city and the

share of managers, blue-collar workers, and unemployed among the city population. These variables capture the economic specialization and social composition of the population.

Before turning to the results, it is necessary to note that, while this model is useful to identify how different factors predict metro area segregation levels, it is mostly descriptive and does not provide a causal interpretation. In particular, reverse causality is possible, in the sense that spatial segregation might influence economic assimilation (Gobillon, Selod, and Zenou 2007).

In Table 8, we show cross-sectional estimates of the model using a sample of 192 metro areas with at least 500 non-European immigrants observed in the 2012 census. To save space, we report only the coefficients of variables associated with public housing, while the estimates for other covariates are displayed in the online appendix Table A3. For each specification, we report results both with and without controlling for group and metro area characteristics to assess how controlling for these factors affects the estimates of the effect of public housing on segregation.

Columns (1) and (2) show that, in 2012, the dissimilarity of public housing and the share of non-European immigrants living in large projects are positively correlated with non-European immigrants' dissimilarity. In Column (1), the coefficient indicates that an increase in the dissimilarity of public housing by 10 p.p. increases by 1.4 p.p. the dissimilarity of non-European immigrants. We also find that, if all non-European immigrants lived in large housing projects, this would increase the dissimilarity index by 16 p.p. In contrast, the effect of the share of non-European immigrants in small housing projects is small and not statistically significant. Column (2) shows that these results are unchanged when our extensive set of controls for group and cities' characteristics is included in the model. If anything, the coefficient of the share of non-European immigrants in large projects increases.

Columns (3) and (4) repeat the analysis using the adjusted isolation index (Eta^2) as a dependent variable. As for the dissimilarity index, the results indicate that a higher share of non-European immigrants in large housing projects is associated with higher isolation levels. In Column (4), when additional controls are included, the effect of a higher share of non-European immigrants in large housing projects increases and becomes statistically significant. Overall, public housing dispersal and concentration, on the one hand, and group and city characteristics, on the other, each explain approximately a third of the variance of dissimilarity and isolation indices across metro areas.

To assess what factors predict the prevalence of immigrant enclaves across cities, Columns (5) and (6) show estimates of models where the dependent variable is the proportion of non-European immigrants of the metro area who live in an immigrant enclave. As previously, enclaves are defined as a census tract where the share of immigrants in the population is superior to 30%. Clearly, the share of non-European immigrants in large projects predicts well their share in enclaves. Interestingly, the adjusted R2 does not increase much when additional controls are included in the model, while the coefficient of the effects of large housing projects increase. This suggests that the concentration of non-European immigrants in large housing projects explains most differences in the share of non-European immigrants in enclaves, while differences between either group or city characteristics have little predictive power.

In Appendix Table A2, we check the robustness of these results by re-estimating the model using first-difference regressions from 1982 to 2012. In this specification, each coefficient is identified using changes within metro areas over time instead of cross-sectional differences. Overall, the estimated effects of the share of non-European immigrants in large public housing on the different segregation indices are very similar.

Appendix Table A3 shows how the characteristics of the groups and metro areas relate to the differences in segregation levels. Consistent with assimilation theory, dissimilarity and isolation are higher when there are more blue-collar workers and unemployed persons in the group. Finally, dissimilarity levels tend to be larger in more populated metro areas. There is also some evidence that segregation levels were higher in 2012 in metro areas with a larger share of non-European immigrants who arrived in the last ten years.

VIII. The distribution of immigrant inflows across neighborhoods by project size

In this section, we turn to census tract level data to understand what led large housing projects to have a disproportionate influence on metro area level segregation. First, we test whether, following an increase in the number of non-European immigrants in the metro area, the proportion of non-European immigrants progresses more rapidly in large housing projects than in smaller ones, thus reinforcing their influence on segregation. Second, we investigate how the population in the private housing sector next to large projects changes in response to the same inflows.

Immigrant inflows by project size

We begin by testing for differences in the progression of non-European immigration across housing projects when the share of non-European immigrants in the metro area population increases. As in Table 4, we classify housing projects in four groups using the quartiles q of the initial share of public housing across census tracts.[23] Using data from the 1990, 1999, and 2012

[23] The distribution is taken conditionally on having some inhabitants in public housing.

censuses that allow us to follow census tracts over time,[24] we estimate separately for each group of housing projects q the following model:

$$\Delta p_{nlt}^{PH} = \Delta p_{lt} \alpha_q^{PH} + e_{nlt} \quad (2)$$

where $\Delta p_{nlt}^{PH} = \Delta\left(\frac{I_{nlt}^{PH}}{L_{nlt}^{PH}}\right)$ is the change in the share of non-European immigrants in public housing in the census tract n between two censuses (1990–1999 and 1999–2014) in metro areas l with I_{nlt}^{PH} being the number of non-European immigrants in public housing in the census tract and L_{nlt}^{PH} being the total population in public housing in the tract. The term $\Delta p_{lt} = \Delta\left(\frac{I_{lt}}{L_{lt}}\right)$ refers to the change in the share of non-European immigrants in the metro area. Each parameter α_q^{PH} approximates an elasticity: these parameters indicate how, for each quartile q of housing projects, the share of non-European immigrants in public housing increases when their share increases in the population of the metro area. If recently arrived non-European immigrants are more likely to live in public housing, these coefficients should be larger than one. If, in addition, their share increases more rapidly in large projects, the coefficient of the fourth quartile should be larger than the coefficient of the first.

Reverse causality is an important issue. Inflows of immigrants in the metro area might not be exogenous. Because living in large housing projects might be associated with negative amenities, such as low-quality buildings, relatively affluent natives might have left large housing projects as better housing opportunities became available in the suburbs. As a result, metro area

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[24] As discussed above, we cannot match census tracts from the 1982 census over time; thus, the sample is restricted to the period from 1990 to 2012.

level inflows of immigrants in a given city might be, to some extent, an endogenous response to the availability of public housing left by the natives for other reasons (Verdugo 2016).

We deal with this issue with an instrumental variable strategy. As in Card (2001) and Cortes (2008), our instrument is based on ethnic networks. The idea that underlies this widely used instrument is that, to some extent, the location choice of immigrants in their destination country depends on the pre-existing presence of networks that are unrelated to unobserved city-specific factors that might bias our regressions.

Specifically, we predict $\hat{I}_{lct}$, the number of immigrants from country *c* in metro area k in 1990, 1999, and 2012, by multiplying the total number of immigrants I_{ct} from that country in year t with the proportion of immigrants of that nationality who were observed in the metro area in the 1968 census $\lambda_{cl,68} = \frac{I_{cl,68}}{I_{c,68}}$, which is the most distant distribution network available. Adding up across the countries of origin, the predicted total number of immigrants in metro area k is then given by $\hat{I}_{lt} = \sum_c \hat{I}_{lct} = \sum_c \lambda_{cl,68} I_{ct}$. Given the large sample size, we exploit the 54 different countries of birth that are available in the data. Because the endogenous variable is a percentage, our final instrument $\Delta\hat{p}_{lt}$ is defined by using changes in the number of predicted immigrants in the location divided by the initial population of the metro area L_{kt-1}, i.e., $\Delta\hat{p}_{lt} = \frac{\hat{I}_{lt} - \hat{I}_{lt-1}}{L_{lt-1}}$.

Table 9 shows the regression results. To ensure representativeness, we weight each regression by the number of inhabitants in the census tract. Below each panel for the 2SLS estimates, the first-stage Fisher statistics indicate that our instrument is reasonably strong, with a F-stat that is superior to 10 in most of the specifications.

Because the coefficients are significantly larger than one, both OLS and 2SLS estimates confirm that, when the share of non-European households increases in the metro area, it changes disproportionately the population in the public sector relative to the private housing sector. The 2SLS estimates reported in Column (1) in panel A indicate that an increase of 1 p.p. of non-European immigration at the metro area level increases by 2.1 p.p., on average, the share of non-European immigrants among public housing inhabitants.

In Columns (2)–(5), we test whether the share of non-European immigrants progresses more rapidly in large housing projects. While the coefficient for the fourth quartile is 25% larger than the first in the OLS estimates, we observe the reverse pattern in the 2SLS estimates. As these differences are relatively small, and the estimates are imprecise, we cannot reject the hypothesis of equality across the coefficients in the 2SLS models. Overall, within metro areas, there is no strong causal evidence of a much larger progression of non-European immigrants in large public housing projects. This implies that the influence of large projects on segregation is not driven by a disproportionate growth of the share of immigrants compared with that recorded in smaller projects within metro areas.

How did the composition of the private housing sector respond?

Next, we examine what happens in the private housing sector next to public housing projects of different sizes following an exogenous inflow of immigrants at the metro-area level. We consider the model:

$$\Delta p_{nlt}^{PV} = \Delta p_{lt} \alpha_q + e_{nlt} \qquad (3)$$

which is similar to the model in the previous section except that the dependent variable $\Delta p_{nlt}^{PV} = \Delta\left(\frac{I_{nlt}^{PV}}{L_{nlt}^{PV}}\right)$ is the change in the share of non-European immigrants in *private sector*

housing. As previously, we distinguish census tracts by the proportion of the public housing sector by using the four quartiles *q* of the share of public housing in the tract. We also examine separately what occurs in neighborhoods with no public housing inhabitants (approximately 8% of the census tracts).

Table 10 reports the results. We find that the share of non-European immigrants increased much more rapidly in the private sector housing of census tracts with large housing projects. An increase by 1 p.p. of the immigrant share translates into a 1.5 p.p. increase of the share of non-European immigrants in the census tracts of the last quartile, where large housing projects are located. While this is 30% inferior to their progression in the public sector housing of the tracts, it is three times as large as their progression in census tracts either without or with few public housing units with estimated coefficients of between 0.4–0.5.

Overall, these results indicate that an inflow of immigrants in the metro area is disproportionately directed to census tracts with the largest housing projects *both* in private and public sector housing. In contrast, census tracts with little public housing are much less affected by the growth of non-European immigration, except in the housing projects.

IX. Conclusions

This paper examined the role of public housing in the evolution of spatial segregation of non-European immigrants in France. With the important exception of Musterd and Deurloo (1997), prior research, which has mostly focused on the North American context, has paid little attention to this factor. While public housing is one of many factors shaping segregation, we expected it to play an increasingly important and ambivalent role in France and, more generally, in Europe.

We find that in spite of the large increase in the share of non-European immigrants in public housing, their average segregation levels rose only moderately over the past three

decades. However, this trend hides a lot of variability across cities and a substantial increase in the proportion of non-Europeans living in immigrant enclaves. Confirming our expectations, we find that the share of non-European immigrants living in large housing projects is strongly related to differences in segregation patterns across cities—both in terms of dissimilarity and isolation indices and in terms of enclave concentration.

Our neighborhood-level empirical analysis documents the ambiguous consequences of public housing on the dynamics of segregation. On the one hand, the progression of non-European immigrants in the largest public housing projects was reinforced by their disproportionate growth in the neighboring private sector housing. The growth of enclaves is explained by the large inflows in *both* public and private housing in neighborhoods that host the largest projects. On the other hand, the progression of non-European immigrants in small housing projects has had little effect on segregation, as it is counterbalanced by their under-representation in the private housing sector in these tracts.

Finally, while prior qualitative studies have argued that non-European immigrants are disproportionately channeled to the largest projects (Bourgeois 2013; Masclet 2006; Sala Pala 2005; Tissot 2006), we find neither large nor significant differences in the share of non-European immigrant inflows entering small- and large-scale projects within a metropolitan area once the endogeneity of metro-area level immigrant inflows is taken into account.

As we exploit cross-sectional census data, we cannot distinguish whether the decrease in the share of natives in the census tracts with large housing projects is driven more by "white-flight" (Bobo and Zubrinsky 1996; Boustan 2010; Hall and Crowder 2014) or "ethnic avoidance" (Andersson 2013; Bråmå 2006; Rathelot and Safi 2014). Further studies using longitudinal data might be able to disentangle these explanations.

Overall, we demonstrate that, to understand contemporary segregation patterns in France—and, we argue, in Europe more broadly—the morphology of public housing needs to be taken into account. Our findings suggest that an increasing participation of non-European immigrants in public housing drives simultaneously processes of residential assimilation, as found by Pan Ké Shon and Verdugo (2014) and of enclave formation—as illustrated in ethnographic accounts (Delarue 1991; Dubet 1987; Lapeyronnie 2008; Lepoutre 2001).

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XI. Tables

Table 1: Immigration and public housing in Europe

	Share foreign born in population	Share public rental sector	Share immigrants living in public housing	Public housing residents who are immigrants
Austria	14.7	25	20	6
Denmark	6.6	21	60	20
England	9.5	18	28	10
France	8.8	17	30	22
Germany	12.7	6	15	29
Netherlands	10.6	35	51	34

Source: Column 1 is from the International migration database (OECD, 2018), except for France, where we use the French census data. Columns 2, 3, and 4 are from Whitehead and Scanlon (2007, Tables 1 and 11), except for Germany in Columns 3 and 4, where the figures are from GSOEP (2013); tabulations are from the authors. Notes: Column 1 shows the share of foreign-born in the population, except for France, where the share of immigrants is reported. Column 2 shows the share of the public housing sector with respect to other type of housing tenure (owner occupation and private rental). Column 3 shows the share of immigrants living in public housing. All figures are from 2006, except for Germany in Columns 3 and 4, where the figures refer to 2012. Each figure is in percentage points.

Table 2: Immigration and public housing in France, 1982-2012

A. Share of immigrants in France				
	1982	1990	1999	2012
Share of Immigrants in the population	7.4	7.4	7.4	8.8
Share of Immigrant *households* in the population	9.1	9.0	9.1	10.5
Share of Non-European imm. *households* in the population	3.4	3.9	4.7	6.4
B. Share of households from the group living in public housing				
All households	13.4	14.5	16.0	14.5
Natives	12.7	13.5	14.7	12.7
Immigrants	20.8	24.1	28.9	30.3
Non-European immigrants	30.2	34.6	41.1	41.3
C. Share of the group among households in public housing				
Immigrants	14.1	14.9	16.4	21.8
Non-Europeans immigrants	7.8	9.4	12.0	18.0

Source: 1982, 1990, 1999, and 2012 Censuses. Notes: Tabulations are from the authors. We categorize a household as immigrant if the head of household is an immigrant. Panel A reports the share of each group in the population. Panel B reports the share of each member of the group that lives in public sector housing relative to private sector housing. Panel C shows the share of each group among all households living in public housing. Each figure is in percentage points.

Table 3: How segregated are public housing projects?

A. Dissimilarity indices of households in public housing (in p.p.)				
	1982	1990	1999	2012
France	57.4	58.8	54.1	50.6
Paris	60.7	63.4	59.2	55.8
Lyon	58.8	61.2	54.0	50.1
Marseille	68.8	68.2	61.9	60.7
Lille	55.5	56.3	52.1	48.7
B. Isolation indices of households in public housing (in p.p.)				
France	47.2	50.9	49.3	44.7
Paris	48.9	54.6	54.6	50.6
Lyon	47.8	51.4	47.7	42.7
Marseille	51.4	53.1	49.5	47.6
Lille	49.9	50.9	49.1	45.1

Source: 1982, 1990, 1999, and 2012 Censuses. Notes: Calculations are from the authors. The segregation indices are calculated using the distribution of households living in the public sector housing across census tracts. The dissimilarity indices compare the distribution of households in public housing relative to households in private sector housing (homeowner or private sector renting). Each index is in percentage points.

Table 4: The distribution of households by the size of the housing projects in 2012

A. Distribution of households living in public housing by project size				
	Share public housing in the census tract in 2012			
	(0-5%]	(5-16%]	(16-37%]	>37%
All households	4.4	19.5	29.8	47.2
Immigrant households	2.2	12.1	24.7	61.0
Non-European imm. households				
France	1.9	10.8	23.7	63.5
Paris	1.3	7.1	21.5	70.1
Lyon	1.7	13.2	29.3	55.8
Marseille	2.4	10.9	21.0	65.8
A. Construction period of public housing by project size				
Share constructed before 1975	30.0	37.1	50.1	68.1
Share constructed before 1981	41.4	53.1	67.2	84.8

Source: 2012 Census. Notes: Tabulations are from the authors. Panel A shows the distribution of households living in public housing according to the share of public housing inhabitants in the neighborhood. We categorize a household as Non-European if the head of household is a Non-European immigrant. Panel B shows the share of housing projects constructed before 1975 and before 1981 in each category of census tracts. Each figure is in percentage points.

Table 5: Dissimilarity indices (in p.p.) across metro areas, 1982–2012

	1982	1990	1999	2012
A. Weighted average by group				
European imm. households	19	19	18	17
Non-European imm. households	33	33	34	34
B. Dissimilarity Indices of Non-European imm. households across major metro areas				
Paris	31	30	32	33
Lyon	31	33	35	36
Marseille	35	33	36	40
Nice	21	22	26	33
Lille	42	42	43	41
Toulouse	31	32	32	30
Bordeaux	37	35	36	35
Nantes	43	45	41	38
Toulon	36	37	36	45
Douai	40	39	36	33
Strasbourg	32	35	39	35
Grenoble	31	32	34	33
Rouen	36	39	37	35
Montpellier	28	28	27	30
Nancy	36	40	37	35

Source: 1982, 1990, 1999, and 2012 Censuses. Note: Calculations are from the authors. Panel A shows the weighted average dissimilarity indices of European and non-European households across French metro areas using the population of the group in the metro area as weights. Only metro areas with more than 500 immigrants are included in the calculation. We categorize a household as Non-European if the head of household is a Non-European immigrant. The dissimilarity indices compare the distribution of non-European immigrant households relative to all other households (including natives and European immigrants). Each index is in percentage points.

Table 6: Isolation indices across metro areas, 1982-2012

	Isolation index (in p.p.)				Adjusted Isolation index Eta^2 (in p.p.)	
	1982	1990	1999	2012	1982	2012
	A. Weighted average by group					
European imm. household	10.0	8.8	7.5	7.1	1.9	1.2
Non-European imm. households	11.5	13.0	16.0	20.7	5.3	9.3
	B. Non-European immigrant households across major metro areas					
Paris	13.0	15.0	18.8	25.4	5.4	7.9
Lyon	10.2	12.5	15.4	19.3	4.2	8.2
Marseille	16.3	15.3	17.1	20.5	9.3	9.1
Nice	7.9	8.5	10.2	14.6	2.3	3.9
Lille	10.2	11.8	14.1	17.2	6.0	8.7
Toulouse	7.7	9.8	14.0	15.8	3.9	9.0
Bordeaux	5.0	5.9	8.2	11.2	2.5	4.5
Nantes	3.9	6.2	8.2	12.4	2.4	5.4
Toulon	13.0	12.0	11.0	12.8	8.5	6.5
Douai	6.2	6.2	5.8	6.1	3.4	2.8
Strasbourg	8.6	12.9	17.5	21.3	3.8	9.8
Grenoble	10.0	10.8	13.6	15.9	4.2	7.2
Rouen	5.3	8.1	10.5	14.3	2.7	6.5
Montpellier	9.1	11.6	15.3	20.1	3.3	7.7
Nancy	6.5	8.0	8.7	12.6	3.3	5.1

Source: 1982, 1990, 1999, and 2012 Censuses. Note: Panel A shows the weighted average isolation index of European and non-European immigrants across French metro areas. We consider all immigrants independently of their housing tenure. Only metro areas with more than 500 immigrants in the group are included in the calculation of the weighted average. The last two columns show the adjusted isolation index Eta^2. We categorize a household as Non-European if the head of household is a Non-European immigrant. Each index is in percentage points.

Table 7: Distribution of census tracts and non-European immigrant households by the share of immigrant households in the population

A. Distribution of census tracts								
Share of immigrant households in the census tract population								
	00-01	01-05	06-10	10-15	16-20	21-25	26-30	>30
1982	9.9	24.7	25.8	18.6	10.8	5.2	2.5	2.5
1990	9.2	26.2	26.2	18.2	10.1	5.2	2.4	2.6
1999	7.2	28.7	27.3	16	9.0	4.7	2.8	4.2
2012	4.7	29.8	26.1	14.6	8.8	4.9	3.3	7.9
B. Distribution of non-European immigrant households across census tracts								
Share of immigrant households in the census tract population								
	00-01	02-05	06-10	10-15	16-20	21-25	26-30	>30
1982	0.2	4.9	15.4	23.2	21.1	14.3	9.1	11.7
1990	0.2	5.2	15.9	22.3	20.3	14.2	8.4	13.3
1999	0.2	5.6	15.2	18.9	16.9	12.7	9.6	21.0
2012	0.1	4.8	13.1	15.2	14.3	11	9.1	32.5

Source: 1982, 1990, 1999, and 2012 Censuses. Notes: Panel A shows the distribution of census tracts according to the share of immigrants in the population of the tract. 2.5 % of the tracts comprised over 30% immigrants in 1982, a percentage that increased to 7.9 in 2012. Panel B shows the distribution of non-European immigrant households across these census tracts. In 1982, 11.7% of non-European households lived in census tracts where over 30% of residents were immigrants. This percentage increased to 32.5% in 2012. We categorize a household as Non-European if the head of household is a Non-European immigrant. We consider all immigrants independently of their housing tenure.

Table 8: Metro Area Segregation, cross-section regressions, 2012 Census

Dependent variable	A. Dissimilarity		B. Adjusted Isolation Index (Eta^2)		C. Share of non-Europeans in enclaves	
	(1)	(2)	(3)	(4)	(5)	(6)
Dissimilarity of public housing	0.168*	0.143**			0.487***	-0.101
	(0.096)	(0.059)			(0.184)	(0.212)
Adjusted isolation of public housing (Eta^2)			0.086	0.041	-0.414*	0.259
			(0.069)	(0.044)	(0.240)	(0.248)
Share non-European imm. in "small" housing projects	0.015	0.036	0.014	-0.016	0.117	-0.004
	(0.078)	(0.070)	(0.047)	(0.039)	(0.146)	(0.161)
Share non-Europeans imm. in "large" housing projects	0.163***	0.206***	0.050	0.077***	0.202**	0.246***
	(0.038)	(0.035)	(0.033)	(0.027)	(0.093)	(0.092)
Controls for						
Characteristics of non-European imm. households	No	Yes	No	Yes	No	Yes
Characteristics of metro area	No	Yes	No	Yes	No	Yes
Adjusted R2	0.34	0.61	0.36	0.63	0.85	0.89
N	192	192	192	192	192	192

Source: 2012 Census. Note: The table shows regression results of the dissimilarity index (columns 1–2), the adjusted isolation index (columns 3–4), and the share of non-European immigrants in enclaves (columns 5–6) on the indicated variables. To calculate the indices, we included all immigrants independently of their housing tenure. Enclaves are defined as a census tract where the share of immigrants in the population is superior to 30%. The model is estimated on a cross-section of 192 metro areas with at least 500 non-European immigrants in 2012. The segregation indices are measured in 2012 for non-European immigrant households at the metro area level using all other households as a comparison group. The sample includes 192 metro areas. The share of non-European immigrants in large (small) projects is the share of non-European immigrants households in housing projects located in census tracts where the share of households in public housing is superior (inferior) to 37%. Robust standard errors are displayed in parenthesis. (*), (**), and (***) denote statistical significance at the 10%, 5%, and 1% levels, respectively.

Table 9: The impact of metro area level immigrant inflows on small and large housing projects

Census Tracts	All tracts with public housing	Q1: Share Public Housing in tract (0;5%]	Q2: Share Public Housing in tract (5;16%]	Q3: Share Public Housing in tract (16;37%]	Q4: Share Public Housing in tract >37%
	(1)	(2)	(3)	(4)	(5)
	Dependent variable: Δ share of non-European households in the census tract ***among public housing inhabitants***				
	A. OLS Estimates				
Δ Share non-European imm.	1.858***	1.622***	1.705***	1.886***	2.040***
in metro area	(0.073)	(0.151)	(0.094)	(0.072)	(0.087)
	B. 2SLS Estimates				
Δ Share non-Europeans imm.	2.114***	2.301***	1.899***	1.976***	2.047***
in metro area	(0.164)	(0.441)	(0.120)	(0.091)	(0.110)
First Stage Fisher	52	32	43	63	60
N	25 111	6 273	6 275	6 292	6 271

Source: 1990, 1999, and 2012 Censuses. Note: The table shows regression results where the dependent variable is the change in the share of non-European immigrants among public housing inhabitants in the census tract. The independent variable is the change in the share of non-European immigrants in the metro area. Within each panel, the model is estimated alternatively with OLS in panel A and with 2SLS in panel B using a shift-share instrument based on the distribution of immigrants in 1968. Column 1 reports estimates using all census tracts. Columns 2–5 report estimates of the model on different quartiles of the distribution of the share of public housing in the population across census tracts. Regressions are weighted by the number of inhabitants in the census tract. Standard errors are clustered at the metro area level within each panel. (*), (**), and (***) denote statistical significance at the 10%, 5%, and 1% levels, respectively.

Table 10: The impact of metro area level immigrant inflows on private housing sector

Census Tracts	All tracts	Tracts with no Public housing	Q1: Share Public Housing in tract (0;5%]	Q2: Share Public Housing in tract (5;16%]	Q3: Share Public Housing in tract (16;37%]	Q4: Share Public Housing in tract >37%
	(1)	(2)	(3)	(4)	(5)	(6)
	Dependent variable: Δ share of non-European households in the census tract ***among private housing inhabitants***					
	OLS Estimates					
Δ Share non-European imm.	0.924***	0.575***	0.530***	0.626***	0.863***	1.479**
in metro area	(0.026)	(0.045)	(0.048)	(0.019)	(0.023)	(0.107)
	2SLS Estimates					
Δ Share non-Europeans imm.	0.922***	0.514***	0.442***	0.637***	0.922***	1.443***
in metro area	(0.021)	(0.077)	(0.021)	(0.019)	(0.045)	(0.094)
First Stage Fisher	48	21	32	43	63	60
N	28 305	3 194	6 273	6 275	6 292	6 271

Source: 1990, 1999, and 2012 Censuses. Note: The table shows regression results where the dependent variable is the change in the share of non-European immigrants among private housing sector inhabitants in the census tract. The independent variable is the change in the share of non-European immigrants in the metro area. Within each panel, the model is estimated alternatively with OLS in panel A and with 2SLS in panel B using a shift-share instrument based on the distribution of immigrants in 1968. Column 1 reports estimates using all census tracts. Columns 2–6 report estimates of the model on different quartiles of the distribution of the share of public housing in the population across census tracts. Regressions are weighted by the number of inhabitants in the census tract. Standard errors are clustered at the metro area level within each panel. (*), (**), and (***) denote statistical significance at the 10%, 5%, and 1% levels, respectively.

XII. Supplementary Appendix for online publication

Indices of Segregation

The index of dissimilarity is given by:

$$ID_u = \frac{1}{2}\sum_{i \in u}\left|\frac{G_{iu}}{G_u} - \frac{N_{iu}}{N_u}\right| \quad \text{(A1)}$$

Where, for each metro area u, the indices of dissimilarity are calculated at the IRIS level i, using immigrants of a given origin with respect to the rest of the population. The term G_{iu} denotes the number of immigrants living in census tract i, and G_u is the total number of immigrants in the urban unit. The terms N_{iu} and N_u refer to the number of inhabitants in the census tract and in the metro area, respectively, who do not belong to the immigrant group, which, by definition, might include immigrants from other groups.

The index of isolation follows Bell (1954) and is given by:

$$I_u = \sum_{i \in u}\frac{G_{iu}}{G_u} \times \frac{G_{iu}}{population_{iu}} \quad \text{(A2)}$$

where $population_{iu}$ refers to the total population of census tract *i* in metro area *u*. An immigrant group concentration is assessed as the share of the group in the census tract of a member of the group in question.

Because the isolation index is sensitive to the proportion of the group in the population, we also consider Eta^2 indices that control for the effect of the population composition (White, 1986, Massey and Denton, 1988):

$$Eta_u^2 = [(I_u - P_u)/(1 - P_u)] \quad \text{(A3)}$$

where $P_u = (G_u / population_u)$ is the share of minority proportion in metro area *u*.

Appendix Table A1: Education and share in public housing per length of stay, 2012 Census

A. Education level of natives and immigrants heads of households						
	Less than high school graduate	High school graduates	More than high school			
Natives	56.4	16.9	26.6			
Non-European immigrants	59.2	14.6	26.1			
B. Share of immigrant households from the group living in public housing per length of stay						
Length of stay	Less than 5 years	6-10 years	11-15 years	16-20 years	>21 years	All
All immigrants	27.4	33.0	37.0	31.8	30.3	30.3
Non-European immigrants	37.4	42.2	45.2	42.1	42.7	41.3

Source: 2012 Census Notes: Panel A shows the distribution of natives and immigrants across three education categories: less than high-school (*less than the French baccalaureate*), high school graduates (*baccalaureate level*), and more than high school—at least one year of tertiary education. Panel B shows the share of immigrant households from the group living in public housing, depending on the length of stay in France.

Appendix Table A2: Metro area segregation, first-difference regressions, 1982–2012 Censuses

Dependent variable	A. Dissimilarity		B. Adjusted Isolation Index (Eta^2)		C. Share of non-Europeans in enclaves	
	(1)	(2)	(3)	(4)	(5)	(6)
Dissimilarity of public housing	0.026	0.045			0.216	0.232
	(0.096)	(0.094)			(0.273)	(0.228)
Adjusted isolation of public housing			0.009	0.009	-0.338	-0.331
			(0.036)	(0.040)	(0.279)	(0.220)
Share non-European imm. in "small" housing projects	0.143	0.099	0.009	0.022	0.182	0.132
	(0.087)	(0.076)	(0.041)	(0.039)	(0.149)	(0.164)
Share non-Europeans imm. in "large" housing projects	0.346***	0.310***	0.042	0.080**	0.203**	0.212**
	(0.044)	(0.053)	(0.028)	(0.032)	(0.087)	(0.105)
Controls for						
Characteristics of non-European imm. households	No	Yes	No	Yes	No	Yes
Characteristics of metro area	No	Yes	No	Yes	No	Yes
Adjusted R2	0.34	0.47	0.13	0.28	0.71	0.76
N	192	192	192	192	192	192

Source: 1982 and 2012 Censuses. Note: The table shows regression results of changes between 2012 and 1982 of the dissimilarity index (columns 1–2), the adjusted isolation index (columns 3–4), and the share of non-Europeans in enclaves (columns 9–12) on the indicated variables. Enclaves are defined as a census tract where the share of immigrants in the population is superior to 30%. The model is estimated using long-differences between 1982 and 2012, where we regress changes in the segregation indices on changes in the covariates over the two censuses. The segregation indices are measured in 1982 and 2012 for non-European immigrant households at the metro area level, using all other households as a comparison group. The sample includes 192 metro areas with at least 500 non-European immigrants in 2012. The share of non-European immigrants in large (small) projects is the share of non-European immigrants households in housing projects in census tracts where the share of households from the group living in public housing is superior (inferior) to 37%. Robust standard errors are displayed in parenthesis. (*), (**), and (***) denote statistical significance at the 10%, 5%, and 1% levels, respectively.

Appendix Table A3: Additional coefficients of the models of Table 8 and Appendix Table A2

	Cross section 2012			First-differences 1982-2012		
Dependent variable	Dissimilarity	Adjusted Isolation Eta2	Share of non-Europeans in enclaves	Dissimilarity	Adjusted Isolation Eta2	Share of non-Europeans in enclaves
	(1)	(2)	(3)	(4)	(5)	(6)
Characteristics of non-European immigrants						
Share of the group in the metro area population	-0.227	0.251**	1.125***	-0.218	0.347*	1.952***
	(0.167)	(0.127)	(0.402)	(0.269)	(0.191)	(0.497)
Share blue-collar workers	0.297***	0.252***	0.498***	0.203***	-0.013	0.009
	(0.080)	(0.049)	(0.186)	(0.073)	(0.039)	(0.148)
Share managers	0.011	-0.053	0.378	-0.100	-0.132	0.045
	(0.163)	(0.107)	(0.320)	(0.150)	(0.093)	(0.352)
Share unemployed	0.131	0.123*	0.543**	0.134	0.103*	0.369
	(0.103)	(0.071)	(0.247)	(0.105)	(0.061)	(0.230)
Share arrived in last ten years	0.247**	0.100	0.105	0.163***	0.019	0.022
	(0.103)	(0.066)	(0.231)	(0.058)	(0.034)	(0.133)
Average length of stay in France (in years)	0.743***	0.308***	0.638*	0.399***	-0.173**	0.725**
	(0.168)	(0.109)	(0.357)	(0.143)	(0.082)	(0.346)
Metro area characteristics						
Log population	1.652***	0.328	1.313	4.987	4.366**	7.553
	(0.337)	(0.221)	(0.851)	(3.363)	(1.879)	(5.572)
Share immigrants in population	-0.083	0.059	2.475***	0.076	-0.061	3.290***
	(0.145)	(0.078)	(0.289)	(0.247)	(0.203)	(0.557)
Share managers	-0.183	0.058	-0.529	-0.063	-0.029	-0.095
	(0.154)	(0.111)	(0.375)	(0.219)	(0.102)	(0.324)
Share blue-collar workers	-0.289*	-0.375***	-0.783***	-0.145	0.004	0.167
	(0.156)	(0.091)	(0.368)	(0.170)	(0.091)	(0.359)
Share unemployed	0.250	0.216*	-0.334	0.111	0.158	-0.615
	(0.201)	(0.128)	(0.479)	(0.309)	(0.180)	(0.544)

Source: 1982 and 2012 Censuses. Notes: The table shows regression results of the dissimilarity index (columns 1, 4), the adjusted isolation index (columns 2, 5), the share of non-Europeans in enclaves (columns 3, 6) on the indicated variables. The model is estimated on a cross-section of metro areas in 2012 in columns 1, 2, and 3. The model is estimated using long-differences between 1982 and 2012 in columns 4, 5, and 6, where we regress changes in the segregation indices on changes in the covariates over the two censuses. The segregation indices are measured for non-European immigrant households at the metro area level, using all other households as a comparison group. The sample includes 192 metro areas with at least 500 non-European immigrants in 2012 and 1982. The share of non-European immigrants in large (small) projects is the share of non-European immigrants households in housing projects located in census tracts where the share of households in public housing is superior (inferior) to 37%. Robust standard errors are displayed in parenthesis. (*), (**), and (***) denote statistical significance at the 10%, 5%, and 1% levels, respectively.

ABOUT OFCE

The Paris-based Observatoire français des conjonctures économiques (OFCE), or French Economic Observatory is an independent and publicly-funded centre whose activities focus on economic research, forecasting and the evaluation of public policy.

Its 1981 founding charter established it as part of the French Fondation nationale des sciences politiques (Sciences Po), and gave it the mission is to "ensure that the fruits of scientific rigour and academic independence serve the public debate about the economy". The OFCE fulfils this mission by conducting theoretical and empirical studies, taking part in international scientific networks, and assuring a regular presence in the media through close cooperation with the French and European public authorities. The work of the OFCE covers most fields of economic analysis, from macroeconomics, growth, social welfare programmes, taxation and employment policy to sustainable development, competition, innovation and regulatory affairs..

ABOUT SCIENCES PO

Sciences Po is an institution of higher education and research in the humanities and social sciences. Its work in law, economics, history, political science and sociology is pursued through ten research units and several crosscutting programmes.
Its research community includes over two hundred twenty members and three hundred fifty PhD candidates. Recognized internationally, their work covers a wide range of topics including education, democracies, urban development, globalization and public health.
One of Sciences Po's key objectives is to make a significant contribution to methodological, epistemological and theoretical advances in the humanities and social sciences. Sciences Po's mission is also to share the results of its research with the international research community, students, and more broadly, society as a whole.

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