

Real Estate as a Luxury Good: Non-Resident Demand and Property Prices in Paris

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Abstract

This paper examines how the international demand for luxury consumption affects the real estate market in global hotspots. Using a unique data set of housing transactions in Paris, we find that (i) non-resident foreigners crowd out residents in highly desirable areas of the city, especially in good times; (ii) these non-residents overpay and realize lower capital gains when reselling; and (iii) purchases by non-resident foreigners have a causal positive effect on price levels. Our results illustrate the importance of foreign buyers—and their tastes—in attractive locations worldwide.

Keywords: housing markets; secondary residences; luxury consumption; trophy assets.

JEL Codes: R21; R23; R32; D12; G12.

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1 Introduction

Property ownership has historically been regarded as an expression of wealth. In recent years, the relation between private wealth and global real estate ownership has become even more important—and complex—because of the ongoing globalization of the market for luxury properties. A recent report by Savills documents that the amount of private wealth invested in new large (\$10m+) real estate deals worldwide increased from \$146bn in 2008 to \$308bn in 2012. Continued global wealth creation has been a key driver for prime property markets. Real estate in prime locations attracts investors seeking a safe haven, a portfolio diversifier, a “trophy asset” that signals power and sophistication, or just personal pleasure. Certain global hotspots, such as London, have traditionally been viewed as safe-haven investments (Badarinza and Ramadorai, 2014). In other locations, however, safe-haven attributes and the prospect of potential capital gains may not be the first things on foreign buyers’ minds. In this paper, we therefore examine how the international demand for luxury consumption can affect housing prices in an attractive location.

The object of our analysis is the Paris housing market. We obtain detailed information on all real estate transactions in the French capital between 1992 and 2011 involving foreign buyers and sellers from a database of notarial deeds. The data are complemented by a random sample of all transactions for which both the buyer and the seller are French. In total, our database covers 72,837 transactions over a 20-year period. We use variation in purchases by *non-resident* foreigners as a proxy for fluctuations in the international demand for luxury consumption. We validate this measure by showing that a substantial majority of non-resident foreigners indeed use their property as a secondary residence. Relatively few properties bought by non-resident foreigners are rented out (or resold quickly), backing up anecdotal evidence that Paris is not

the first choice for foreign real estate investors with primarily financial motivations.¹ We find much variation in the relative importance of non-residents across buyer nationality groups. For example, we show that Swiss (resp. Chinese) buyers are much more likely to be non-residents (resp. residents) in France, and to use their property as a secondary (resp. primary) residence.

As a proxy for the attractiveness of each neighborhood as a location for a second home, we collect census data on the proportion of secondary residences among all properties in each neighborhood prior to the start of our sample period. We show that, even if all types of neighborhoods have seen an average net inflow of non-resident foreigners since 1992, the crowding out of residents by non-residents has been much stronger in the most attractive neighborhoods. Moreover, in line with expectations, we also find that the demand by non-resident foreigners for real estate in desirable areas goes up more in times of rising economic confidence (i.e., years in which equity markets perform well). These results highlight the enduring appeal of luxury property for investors worldwide.

We then hypothesize that non-resident foreigners, who may have less bargaining power and higher private valuations, overpay in the Paris real estate market. We find strong evidence that non-resident owners are indeed paying higher amounts (keeping property characteristics fixed) and are realizing lower capital gains than other real estate market participants.

Finally, we study the impact of the crowding out of residents by non-residents on real estate prices in the French capital. We find a weak positive conditional correlation between the number of purchases by non-resident foreigners and price changes in an area. When instrumenting the number of purchases by non-resident foreigners (using instruments based on the prior inflow of non-residents and on exchange rate changes weighted by the historical nationality composition

¹In this respect, Paris real estate may be compared to luxury collectibles, such as art. Recent figures compiled by Knight Frank indicate that 61% of high-net-worth individuals acquire investments of passion for “personal pleasure” and 15% to signal their “status”, while investment was the primary driver for only 22% of respondents.

of the buyer population in an area), the evidence looks much stronger. A ten-percent increase in the annual number of purchases by non-resident foreigners in a neighborhood increases prices by about 0.5 percent.

In November 2013, an article in the Wall Street Journal told the following story: “Last fall, after the euro fell against the dollar and new French tax laws took effect, Ms. Whitaker, a Chicago attorney, made her move: She bought an 800-square-foot, light-filled, classic Parisian apartment a short walk from the Eiffel Tower and the Champs-Élysées. ‘It gives me the experience I wanted to have: being a Parisian woman, which I love so much,’ said Ms. Whitaker.” Our results suggest that Ms. Whitaker is not unique in willing to pay up for the Parisian experience—with considerable effects on the local property market.

1.1 Related Literature

This paper contributes to several strands of literature. First, this paper is related to existing studies on the behavior of foreign or “out-of-town” buyers, and their impact on price levels. Chinco and Mayer (2013) document that out-of-town buyers of second houses behaved like misinformed speculators and drove up house price in cities like Phoenix, Las Vegas, and Miami in the mid-2000s. They argue that this type of buyers is less informed about economic fundamentals than local residents, and is therefore more prone to chasing past price trends. Badarinza and Ramadorai (2014) show that international demand for safe-haven assets can impact housing prices in London. Moreover, they argue that “preferred habitats” create temporal persistence in the locational choices of nationality groups of buyers. Cvijanovic, Favilukis, and Polk (2010) study the relation between immigration—typically induced by variation in employment opportunities—and real estate prices. One important difference between these papers and our work is that we focus

on the effects of international demand for *luxury consumption*, which we argue is a more relevant driver of non-resident buyer behavior in Paris than investment motives or future immigration plans.

Second, there is also a small literature on housing price dynamics in highly attractive locations. Ruf and Levi (2011) explore the market for “international” real estate in North America: they study prices of recreational properties in exclusive ski resorts and oceanfront estates, where the rates of foreign ownership are typically elevated. They find that there is a long-term equilibrium relationship between exchange rates and relative price levels. We will build on this result when instrumenting international demand in this paper. Next, Gyourko, Mayer, and Sinai (2013) provide evidence that in highly desirable U.S. cities with low rates of new housing construction—so-called “superstar cities”—a growing group of high-income households has been crowding out households with a lower willingness-to-pay for scarce housing over time. In this sense, living in such a superstar city is like owning a scarce luxury good. In contrast to Gyourko, Mayer, and Sinai (2013), we are interested in the effects of the *international* demand for *secondary* residences.

Third, we add to a literature on the drivers of the demand for luxury consumption goods or “trophy assets”. Aït-Sahalia, Parker, and Yogo (2004) show that luxury consumption is highly correlated with equity returns. They also document a positive relation between prices of exclusive New York apartments and the equity market. Goetzmann, Renneboog, and Spaenjers (2011) show how changes in income inequality and financial asset returns affect the demand for artworks.

Fourth, several papers have studied how price outcomes in markets for illiquid and heterogeneous goods are determined by differences in bargaining power and private valuations between buyers and sellers. Harding, Rosenthal, and Sirmans (2003) show that bargaining power is inversely related to wealth and trading experience in a market. Lovo and Spaenjers (2014) present

a model of trading in unique durable assets—such as artworks and luxury real estate—in which investors with high private use values pay more and realize lower financial returns upon resale.

The remainder of this paper is organized as follows. The next section describes the data, and discusses the geographical and temporal variation in purchases by non-resident foreigners in Paris. It also shows how residents have been crowded out in desirable areas, especially in good times. Section 3 shows that non-residents overpay, and realize lower capital gains when reselling. Section 4 illustrates the weak positive conditional correlation between inflow of non-resident foreigners and property price changes, and then documents a stronger causal effect using an instrumental variables approach. Section 5 concludes.

2 Non-Resident Foreigners in the Paris Housing Market

2.1 Data on Real Estate Transactions

The main data for our study come from the BIEN (“Base d’Informations Economiques Notariales”) database managed by the notary association of the Paris region (“Notaires de Paris – Ile-de-France”). The database of notarial deeds covers about 90% of all transactions taking place in Paris.²

We obtain detailed information on the 39,125 observed transactions of houses and apartments in Paris over the period 1992–2011 in which either the buyer or the seller (or both buyer and seller) was non-French.³ Moreover, we obtain data on a random sample of 10% of all transactions in which both the buyer and the seller were French households—a sample of 33,712 transactions.

²Each property transaction in France needs to take place through a notary, but it is not mandatory for notaries to feed transaction information into the database.

³We only consider trades between households, and not those involving governments, corporations, etc. We also limit ourselves to transactions for which the nationality status of both buyer and seller are known.

In total, our database thus contains information on 72,837 transactions over a 20-year period. Our data set contains detailed information on each transaction and the characteristics of each underlying property. Table 1 shows the number of observations and the average transaction price per year for the different combinations of seller and buyer nationality statuses in our data set. The table illustrates the sharp rise in housing prices in Paris over the last two decades, especially over the periods 1999–2007 and 2009–2011. It also shows that there have been substantially more purchases than sales by foreigners over our time period. The average price in transactions involving non-French households—and especially in transactions in which the seller was foreign—is slightly higher than in exclusively “French” transactions.

[Insert Table 1 about here]

2.2 Foreign Purchases and the Demand for Secondary Residences

Table 2 shows the nationalities that are the most important foreign buyer groups in our data set. We see the largest numbers of purchases by households from Italy, Great Britain, the United States, Portugal, and Algeria. Many of the purchases by foreigners in Paris are of course related to immigration and local employment opportunities rather than the acquisition of a *pied-à-terre*. To document the relevance of luxury consumption demand, we rely on the residence status of the buyers. We argue that purchases by non-resident foreigners are likely to be acquisitions of second homes. We can indirectly test this hypothesis because the data enable us to compute how frequently sellers of each nationality group used their property as a secondary residence (rather than as a rental property, for example). About 25% of foreign sellers used their Paris real estate as a secondary residence, and only 12% as a rental investment. However, among *non-resident* foreign sellers, 62% used their property as a secondary residence, and 27% as a

rental investment.⁴ In Table 2 the correlation between the relative importance of non-residents and the use as secondary residence across nationalities is 0.83. There is clear variation in the relative importance of second houses between nationalities. For example, 72.6% of Swiss buyers are non-residents and 44.7% of Swiss owners used the Paris property as a secondary residence. By contrast, only 4.1% of Chinese buyers reside outside France and not more than 8.8% of Chinese sellers used the property as a second home.

[Insert Table 2 about here]

To further rule out the possibility that speculative investment is a major motive for real estate purchases by non-resident foreigners in Paris, we compute average holding periods for different groups of sellers. The average holding period for domestic sellers is 10.8 years, which compares to 9.8 years for non-resident foreign sellers. These numbers suggest that there is little difference in the speculative activity between foreign and domestic sellers. We can also consider a few descriptive statistics. The average age among all non-resident foreign buyers in our sample is 49.5 years, compared to 42.8 years for all other buyers. While 50% of non-resident foreign buyers have higher managerial and professional positions, only 40% of the other buyers do. Moreover, non-residents buy substantially more expensive properties. For example, in 2011 the average price of a purchase by a non-resident foreigner was 537,543 euros; by contrast, in the “French” sample the average purchase price was 429,306 euros (cf. Table 1). This evidence is consistent with luxury consumption motives being important among non-resident foreigners active in the Paris real estate market.

We now turn to the geographical spread of foreign purchases. Figure 1 shows a map of Paris.

⁴We have data on the use by sellers in about half of all cases. The percentages reported here are ratios computed using the non-missing observations. The (intended) use is missing much more frequently for buyers. A small fraction of foreigners who are officialy not a resident of France seem to use their Paris property as their primary residence.

The area covered by the city is 105 square kilometers (or 41 square miles). Paris is divided into 20 administrative districts or “arrondissements”. Each district has its own postal code and city hall. The district has become an important unit of geographical reference in the city. Figure 1 indicates the districts and the location of some of Paris’ most famous buildings and museums.

[Insert Figure 1 about here]

Table 3 shows how many of the foreign purchases in our database take place in each of these districts. The table also shows how many foreign purchases were by non-residents. Not surprisingly, the percentages are very high for, for example, the 5th, the 6th, and the 7th arrondissement, with the Quartier Latin, the Jardin du Luxembourg, and the Eiffel Tower respectively. The proportions are much lower for the less touristic outer districts, such as the 19th and the 20th arrondissements.

[Insert Table 3 about here]

2.3 Neighborhood Desirability and the Crowding Out of Residents

As the city of Paris has about 2.3 million inhabitants, the average district has a population of over 100,000. Moreover, the districts vary widely in size and population. We therefore use information on a more detailed level, namely that of the “IRIS” (“Ilots Regroupés pour l’Information Statistique”) neighborhood units created by the French statistical office INSEE. Each IRIS is a block of buildings containing about 2,000 inhabitants (individuals, not households). The neighborhoods are homogeneous in terms of building type, and are delimited by main roads. Our database covers transactions in 918 different IRIS neighborhoods in Paris. We have information on about 80 transactions per IRIS on average.

As a proxy for the attractiveness of each neighborhood as a location for a second home, we

collect census data from INSEE on the proportion of secondary residences among all properties in each neighborhood in the year 1990.⁵ Importantly, this measure looks at the *stock* rather than the *flow* of real estate, and it uses data from before the start of our sample period.

We expect non-resident foreigners to purchase real estate in the areas most attractive to buyers of secondary houses. Table 4 shows the estimated relative importance of purchases by non-resident foreigners, aggregated across the whole sample period, for deciles of “desirability” (i.e., the proportion of secondary residences in 1990). As expected we see a strong positive correlation between neighborhood attractiveness as a location for a second home and the importance of purchases by non-resident foreigners in our database (for example, in the least attractive neighborhoods foreign non-residents contribute 1.3% to total purchasing activity, while in the most attractive neighborhoods this percentage rises up to 8.3%). The third column in Table 4 shows a very different pattern for resident foreigners: for example, purchases by resident foreigners constitute 6.8% of all purchasing activity in the bottom decile of neighborhoods sorted on their attractiveness, while their purchases contribute only 4% to all buying activity in the top decile. These figures suggest that we are not just picking up the effect of differences in demand between French nationals and foreigners.

We also compute the aggregate net inflow as the number of purchases by non-resident foreigners minus the number of sales by non-resident foreigners in an area over our complete sample period 1992–2011. The fourth column of Table 4 shows the accumulated net inflow of non-resident foreigners per deciles of desirability. The fifth column further shows the number of years (out of 20) in which net inflow was positive for each desirability category. We see that all

⁵It is important to note that different area characteristics may be important for primary and secondary homes. For example, proximity to schools or traffic routes may not play a role for second homes. As such, local high income earners do not necessarily sort in the areas that are most desirable in the eyes of non-residents, and therefore (implied) rents are not necessarily highest in those areas.

neighborhoods have seen a positive net inflow of non-resident foreigners, but that the crowding out has been much stronger in the most attractive neighborhoods.

[Insert Table 4 about here]

The crowding out of local residents by wealthy non-resident foreigners over time is similar to the historical trends in “superstar cities” documented by Gyourko, Mayer, and Sinai (2013), but on a supra-national level and in the market for secondary residences. Given the positive covariance between equity returns and luxury consumption demand, as documented in (Aït-Sahalia, Parker, and Yogo, 2004), we would also expect that the demand by non-resident foreigners for real estate in desirable areas goes up more in “good times”. We test this hypothesis by relating the annual number of purchases by non-resident foreigners in a neighborhood to the interaction between neighborhood desirability and lagged equity market returns (as captured by returns on the French index CAC40), controlling for year fixed effects and the desirability of the neighborhood. The results of the regression analysis confirm this hypothesis—see models (1) and (2) in Table 5. The estimated coefficient on the interaction term is positive and highly significant, suggesting that purchases by non-resident foreigners indeed increase more in desirable areas in “good times”, i.e., when the equity market is doing well. On the other hand, as we can see from columns (3) and (4), the estimated coefficient on the interaction term is not statistically significant in the case of resident foreigners.

[Insert Table 5 about here]

3 Bargaining Power and Prices Paid by Non-Residents

Prices paid in the real estate market may be a function of the attributes of (potential) buyers and sellers. For a number of different reasons, we could expect non-resident foreigners to overpay

in the Paris real estate market. Previous studies have shown that housing market participants that are uninformed (Wilhelmsson, 2008) and wealthy (Harding, Rosenthal, and Sirmans, 2003) have less bargaining power. Lovo and Spaenjers (2014) present a model of trading in luxury assets in which investors with a high private valuation of the asset are willing to pay more, and realize lower financial returns when reselling.

However, how market participant characteristics relate to bargaining power is not straightforward to measure by comparing prices using hedonic methods, as preferences may be correlated with characteristics. For example, non-resident foreigners may pay more either because they have less bargaining power, or because they buy flats of higher quality along some unobservable dimension. Harding, Rosenthal, and Sirmans (2003) propose the following solution to this problem. Assume that we are interested in the effect of a certain binary attribute (e.g., non-resident foreigner or not) on the price outcome, and that the dummy variable B (resp. S) captures this attribute for the buyer (resp. seller). Under the assumptions of symmetric bargaining power and symmetric demand over buyers and sellers, one can identify the effect of this attribute on bargaining power by introducing the variables $(S - B)$ and $(S + B)$ to the hedonic regression. The coefficient on the first variable measures the effect of seller and buyer traits on bargaining power, while the coefficient on the second variable measures the effect of the same characteristics on demand. We thus run the following hedonic regression:

$$\ln P_{i,t} = \alpha + \kappa(S_{i,t}^{NRF} - B_{i,t}^{NRF}) + \lambda(S_{i,t}^{NRF} + B_{i,t}^{NRF}) + \sum_{m=1}^M \zeta_m x_{m,i} + N + T + \varepsilon_{i,t}, \quad (1)$$

where $P_{i,t}$ is the price of property i in year t , $x_{m,i}$ is the value of hedonic characteristic m for property i , N are neighborhood (i.e., IRIS) fixed effects, T are year fixed effects, and $S_{i,t}^{NRF}$ and $B_{i,t}^{NRF}$ are dummy variables that equal one if the seller or the buyer is a non-resident foreigner.

The “bargaining-power coefficient” κ will be negative if non-resident foreign buyers pay more and sell for less. The “demand coefficient” λ will be positive if non-resident foreigners select properties that are of otherwise unobservably higher quality.

Column (1) of Table 6 shows the results of a regression on our data with the following hedonic characteristics as control variables: (log) floor level, (log) surface area (in m^2), dummy variables indicating the period of construction (going from “before 1850” to “2000–2010”), and dummy variables indicating the presence of a parking place, an elevator, or a terrace. The results clearly show that non-resident foreigners have less bargaining power: they pay more and sell for less. (Not unsurprisingly, we also find that non-resident foreigners prefer properties that are of higher quality in a way not captured by our hedonic variables.) Importantly, the effect is not driven by the foreign nationality of these individuals: column (2) of Table 6 shows opposite signs on the equivalent variables for resident foreigners. In column (3), we also control for differences in bargaining power related to gender, age, and marital status, but the conclusions remain the same. (In line with previous research, we find that female and older individuals have substantially less bargaining power.)

[Insert Table 6 about here]

As we also have information on the *previous* transaction price for slightly more than half of the transactions in our database (even if it took place before 1992), we can verify that non-resident owners are indeed realizing lower capital gains between purchase and sale. To control for the possibility that price appreciation trends vary in function of the demography of the neighborhood—for example because of changes in the wage premium paid to college-educated workers—we use data from INSEE on the percentage of adults with a higher education degree in each neighborhood (measured in 1990, so before the start of our time frame). Converted to

terciles, this gives the variable E . We then run a regression of the following form:

$$\ln R_{i,y_1,y_2} = \alpha + \kappa_S S_{i,y_2}^{NRF} + \kappa_B B_{i,y_2}^{NRF} + Y_1 \times Y_2 \times E + \varepsilon_{i,y_1,y_2}, \quad (2)$$

where R_{i,y_1,y_2} is the annualized gross capital gain on property i bought in year y_1 and sold in y_2 , Y_1 and Y_2 are purchase and sale year dummies, and E are the education level tercile dummies. The triple interaction of fixed effects allows for neighborhood-type-specific price changes between each combination of purchase year and sale year. As before, S_{i,y_2}^{NRF} and B_{i,y_2}^{NRF} are dummy variables that equal one if the seller or the buyer is a non-resident foreigner. A negative κ_S and a positive κ_B signals that non-resident foreigners are getting a worse deal.

Column (1) of Table 7 show the results of the estimation of equation (2). We limit our sample to holding periods of at most 20 years, to mitigate the effects of improvements and/or deteriorations that may become important over longer time periods, and that might also correlate with buyer and seller attributes. In line with the hedonic results, we find that non-resident foreigners realize significantly lower capital gains. The annualized capital gain is lowered by more than one percentage point on average (the reported coefficient on S_{i,y_2}^{NRF} is -0.013), so the effect is also economically meaningful. Furthermore, capital gains realized by all owners are higher if they resell to a non-resident foreigner (the estimated coefficient on B_{i,y_2}^{NRF} is 0.005 and is highly statistically significant). Importantly, we keep the year of purchase and the year of sale constant here; ours is thus not a result about timing of exit as in Chinco and Mayer (2013). In column (2), we add arrondissement fixed effects to our model, to control for, for example, geographical variation in the longer-run gentrification trends within the city. The results remain very similar.

[Insert Table 7 about here]

4 The Impact of Non-Resident Demand on Prices

4.1 Conditional Correlations

A next question is what is the impact of the crowding out of residents by non-residents on real estate prices in the French capital? In a first step, we expand equation (2) as follows:

$$\ln R_{i,y_1,y_2} = \alpha + \delta \ln Purchases_{n,y_1 \rightarrow y_2}^{NRF} + \kappa_S S_{i,y_2}^{NRF} + \kappa_B B_{i,y_2}^{NRF} + Y_1 \times Y_2 \times E + \varepsilon_{i,y_1,y_2}, \quad (3)$$

where $Purchases_{n,y_1 \rightarrow y_2}^{NRF}$ equals the average annual number of purchases (plus one) by non-resident foreigners in neighborhood n between purchase year y_1 and sale year y_2 , and the other variables were defined before. If δ is positive, then higher capital gains are realized on properties in neighborhoods that have seen more purchases by non-resident foreigners over the holding period. ($Y_1 \times Y_2 \times E$ allows for different average appreciation rates for all combinations of holding intervals and neighborhood demography types.)

We estimate equation (3) in column (1) of Panel A of Table 8. We need to limit ourselves to properties for which we observe two prices between 1992 and 2011. Robust standard errors are clustered by arrondissement. We see a highly significant—but in terms of economic magnitude relatively low—positive conditional correlation between the number of purchases by non-resident foreigners and price changes. (The coefficient of 0.005 implies that ten percent more purchases by non-resident foreigners goes together with an price increase of about 0.05 percent.) To mitigate concerns that the effect is driven by overpaying on the part of non-residents with low bargaining power (or high private valuations), we repeat the estimation excluding properties sold to non-resident foreigners in column (2). The regression coefficient is about 40% smaller than before, but the effect does not completely disappear (p -value = 0.116).

In column (3), we allow for arrondissement-specific price trends. In column (4), we control for the desirability of each neighborhood, measured by the variable $Secondary_n$, i.e., the proportion of secondary residences prior to the start of our sample period. This variable could pick up differences in average price trends between neighborhoods that are more or less attractive to non-residents. In column (5), we combine the arrondissement fixed effects and the desirability variable as controls. Even though the slope coefficients on the variable of interest are still positive, they are not statistically significantly different from zero at traditional levels. By contrast, there is a strong positive correlation between the attractiveness of a neighborhood as location for a secondary residence on the one hand and appreciation rates on the other hand.

Panel B of Table 8 repeats all models using a lagged independent variable, i.e., the number of purchases by non-resident foreigners in the neighborhood between year $y_1 - 1$ and year $y_2 - 1$. Again, we see a statistically significant positive conditional correlation between lagged number of purchases by non-resident foreigners and price changes. When we exclude transactions that involve purchases by non-resident foreigners, the estimated conditional correlation remains positive and highly significant. Once we add controls for the arrondissement-specific price trends and/or for the desirability of a neighborhood, the estimated conditional correlation remains positive, but the statistical significance largely disappears.

[Insert Table 8 about here]

4.2 Instrumental variables approach

One concern is that properties in neighborhoods with different inflows of non-residents might have different rates of appreciation for reasons unrelated to that inflow, even when controlling for the different capital gains on houses in (ex ante) highly educated or attractive areas over

our time frame. For example, it may be that public investments in the quality of daily life in a neighborhood lead to both an increase in property prices and to an increase (or decrease) in the attractiveness of the neighborhood to foreigners.

To solve this endogeneity problem, we need to find an exogenous source of variation in the number of purchases by non-resident foreigners, so that we can implement an instrumental variables approach. We proceed as follows. We split the sample time frame in half. We use the first half of the sample (1992–2001) to create two instruments for the inflow of foreign non-residents. We then use the second half of the sample (2002–2011) data to estimate our models of interest.

Our first instrument, $\ln RelPurchases_{q,1992 \rightarrow 2001}^{NRF}$, counts the total number of purchases by non-resident foreigners in each “grand quartier” over the 1992-2001 subsample. Grand quartiers are statistical areas that encompass multiple neighborhoods; however, they are smaller than districts. In total, there are 80 grand quartiers in Paris. Because they vary in size, we scale the number of non-resident purchases over the period 1992–2001 by the population in each area prior to the beginning of the sample, in 1990. The rationale for using this instrument is that the number of foreign non-resident purchases is expected to be correlated over time. The intuition for this rationale is twofold. First, as argued by Badarinza and Ramadorai (2014) in the case of the London property market, foreign buyers flock together in so-called “preferred habitats”, which generates temporal persistence in the locational choices of nationality groups of buyers. Second, the initial presence of different foreign buyer nationality groups leads to a reduction of information asymmetries, which can spur future foreign buyer inflow. The number of non-resident foreign purchases in an area prior to 2002 should thus predict non-resident foreign purchases since 2002, while being orthogonal to unexplained property capital gains in that later period.

Our second instrument, $FX_{q,y_1-1 \rightarrow y_2-1}$, relies on changes in demand fluctuations for Paris real estate as a luxury good induced by changes in the relative strength of the local currency needed to pay for a property. Ruf and Levi (2011) show that prices of “international properties” (e.g., ski resorts and oceanfront estates) in North America are affected by exchange rate movements. Anecdotal evidence suggests that exchange rates matter for the Paris housing market as well,⁶ and regressions of annual purchases (or net inflows) by non-resident foreigners from different countries against changes in the relevant exchange rates confirm that a relation exists (not reported). We construct an instrument that varies both geographically and over time. We count the total number of purchases over the period 1992–2001 in each area for each of the 15 nationalities that are the largest groups of non-resident buyers over the same time frame. Between 2002 and 2011, for each area, we then weigh lagged changes in the real exchange rates (foreign currency / euro) of the 15 countries by the relative importance of each nationality group in the area over the first half of the time frame. For example, if the euro wins 30% in value relative to the USD, while other currencies remain constant relative to the euro, then the weighted exchange rate will go up more in areas that have seen larger inflows of Americans between 1992 and 2001. The assumption here of course is that there is a tendency of non-resident foreigners to buy in areas where their countrymen have bought before, for the reasons outlined before. Additional analysis shows that such correlation over time in the choice of location by nationalities indeed exists (not reported).

Table 9 shows the results of our analysis. In each case, we instrument the average annual number of purchases by non-resident foreigners over the holding period in the first step, using the

⁶For example, in 2008 an American property consultant in Paris was quoted in a New York Times article saying that: “The dwindling dollar means people saving up their pennies to buy property in Paris have less to spend”. In 2012, the website of another consultant advised its visitors to “take advantage of the 20% discount that the low euro gives you on real estate”.

two variables presented above. In the second step, we estimate the relation between non-resident demand and prices as described by equation (3). In Panel A, we include *arrondissement* fixed effects, but do not control for variation in the desirability of neighborhoods. In Panel B, we also control for the desirability of neighborhoods, using the proportion of secondary residences in 1990. In Panel C, we allow for differences in average appreciation rates between each combination of holding interval and desirability decile, i.e., $Y_1 \times Y_2 \times D$.

[Insert Table 9 about here]

We find that purchases in the first half of our time frame carry strong predictive power for purchases in the second half, even when controlling for the desirability of each neighborhood (Panel B) or for the interaction between holding intervals and desirability (Panel C): the estimated coefficients on the instrument in the first-stage regressions are positive and highly significant. As expected, the results of the first-stage regressions that include the log annualized gross change in the weighted real exchange rate as an additional instrument (model (2) in each panel) show that the relative price of the euro is negatively related to non-resident purchases, although the statistical significance disappears when adding the additional controls for neighborhood desirability (Panel B and C).

By inspecting the estimated coefficients on $\ln Purchases_{n,y_1 \rightarrow y_2}^{NRF}$ in the second-stage regressions, we see that they are positive and significant at conventional levels across the board, ranging from 0.048 in Panel C to 0.058 in Panel B. Therefore, in all cases we can conclude that purchases by non-resident foreigners impact price levels in a statistically significant way. A ten-percent increase in the number of annual purchases by non-resident foreigners—or, more precisely, an increase in the demand by non-residents that leads to such a ten-percent increase—causes an increase in prices of about 0.5 percent. It is interesting to note, however, that the positive

coefficient on the desirability variable disappears in the second-stage regression of Panel B; we can thus conclude that the higher capital gains in desirable areas are due to the demand by non-resident foreigners in those neighborhoods.

5 Conclusion

In this paper, we examine how the international demand for luxury consumption affects prices and returns in the Paris housing market. We obtain detailed information on all real estate transactions in Paris between 1992 and 2011 involving foreign buyers and sellers—and on a random sample of transactions with French buyers and sellers—from a database of notarial deeds. We find that (i) non-resident foreigners crowd out residents in highly attractive areas of the city, especially in good times, (ii) these non-residents overpay and realize lower capital gains when reselling, and (iii) purchases by non-resident foreigners have a causal effect on price levels. These results contribute to our understanding of the role of foreign or “out-of-town” buyers in real estate markets, and of the housing price formation in highly attractive locations.

References

- Aït-Sahalia, Yacine, Jonathan A. Parker, and Motohiro Yogo, 2004. Luxury goods and the equity premium. *Journal of Finance* 59, 2959–3004.
- Badarinza, Cristian, and Tarun Ramadorai, 2014. Preferred habitats and safe-haven effects: Evidence from the London housing market. Working paper.
- Chinco, Alex, and Chris Mayer, 2013. Misinformed speculators and mispricing in the housing market. Working paper.
- Cvijanovic, Dragana, Jack Favilukis, and Christopher Polk, 2010. New in town: Demographics, immigration, and the price of real estate. Working paper.
- Goetzmann, William N., Luc Renneboog, and Christophe Spaenjers, 2011. Art and money. *American Economic Review (Papers and Proceedings)* 101, 222–226.
- Gyourko, Joseph, Christopher Mayer, and Todd Sinai, 2013. Superstar cities. *American Economic Journal: Economic Policy* 5, 167–199.
- Harding, John P., Stuart S. Rosenthal, and C. F. Sirmans, 2003. Estimating bargaining power in the market for existing homes. *Review of Economics and Statistics* 85, 178–188.
- Lovo, Stefano, and Christophe Spaenjers, 2014. Unique durable assets. Working paper.
- New York Times, 2008. *In Paris, Owning an Eleventh of an Apartment*. 14 May 2008.
- Ruf, Thomas, and Maurice Levi, 2011. The law of one price in unfamiliar places: The case of international real estate. Working paper.

Wilhelmsson, Mats, 2008. Evidence of buyer bargaining power in the Stockholm residential real estate market. *Journal of Real Estate Research* 30, 475–500.

Figure 1: A map of Paris indicating the 20 “arrondissements”



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Table 1: Numbers of observations and average transaction prices 1992–2011

Year	Foreign buyer		French buyer		Foreign buyer		French buyer		%
	N	Mean price	N	Mean price	N	Mean price	N (10%)	Mean price	
1992	325	162,701	129	140,622	28	108,508	929	155,301	3.6%
1993	381	141,743	142	150,699	29	143,059	1,098	147,295	3.6%
1994	607	154,100	286	137,871	43	147,315	1,431	146,583	4.3%
1995	704	152,020	259	148,743	64	126,888	1,200	139,829	5.9%
1996	951	110,947	421	143,265	108	154,437	1,745	139,780	5.6%
1997	976	112,469	378	139,777	87	151,708	1,597	129,465	6.1%
1998	1,348	125,488	466	131,015	111	133,981	1,911	138,129	6.9%
1999	1,399	132,298	678	147,919	127	148,921	2,415	140,590	5.8%
2000	1,746	160,659	660	171,802	161	210,618	2,249	165,667	7.6%
2001	1,820	175,260	665	186,601	190	174,755	2,211	167,340	8.1%
2002	855	185,548	417	187,443	89	160,609	1,153	172,611	7.3%
2003	1,694	206,642	810	213,694	194	218,723	1,941	210,827	8.5%
2004	1,707	234,914	982	242,469	223	215,388	2,011	241,465	8.4%
2005	1,733	277,729	1,056	282,931	215	307,204	2,169	278,399	7.9%
2006	819	305,585	547	318,017	109	310,849	1,023	310,273	7.9%
2007	1,618	361,320	990	342,080	211	350,222	2,027	333,059	7.9%
2008	1,418	373,112	852	337,770	193	365,194	1,635	331,879	8.6%
2009	1,191	356,352	788	336,484	163	312,493	1,348	349,579	8.7%
2010	1,270	395,714	1,107	369,812	200	377,040	1,943	386,891	6.7%
2011	1,159	451,912	1,026	412,197	200	437,779	1,676	429,306	7.1%
Total	23,721	239,232	12,659	261,727	2,745	260,446	33,712	226,841	7.0%

Notes: This table shows the composition of our database, mean price levels, and the estimated relative importance of foreigners among all real estate buyers in each sample year. The data come from the BIEN (“Base d’Informations Economiques Notariales”) database managed by the notary association of the Paris region (“Notaires de Paris – Ile-de-France”). Our data set includes all transactions of houses and apartments in Paris over the period 1992–2011 in which either the buyer or the seller (or both buyer and seller) was non-French, and a random sample of 10% of all transactions with a French buyer and seller.

Table 2: Most important foreign buyer groups 1992–2011

Nationality	Number of purchases	Non-residents among buyers	Use as secondary residence among sellers
Italy	4,275	57.3%	29.3%
Great Britain	2,345	49.8%	23.7%
United States	2,030	61.9%	32.2%
Portugal	1,798	3.1%	14.5%
Algeria	1,500	19.5%	26.0%
China	1,499	4.1%	8.8%
Germany	1,286	39.0%	25.1%
Spain	1,144	23.4%	16.9%
Maroc	1,065	33.1%	25.2%
Tunesia	753	18.1%	17.1%
Belgium	736	44.6%	25.1%
Switzerland	537	72.6%	44.7%
Ireland	466	60.9%	24.7%
Japan	454	26.2%	22.9%
Iran	377	34.0%	30.2%

Notes: This table shows the foreign nationalities with the largest numbers of purchases in our database. It also shows the proportion of non-residents among foreign buyers, and the relative importance of secondary residences (vs. primary residences and rental properties) among foreign sellers.

Table 3: Foreign purchases per arrondissement 1992–2011

Arrondissement	Number of foreign purchases	Non-residents among foreign buyers
1 st arrondissement	389	63.8%
2 nd arrondissement	478	56.7%
3 rd arrondissement	1,054	61.4%
4 th arrondissement	932	72.4%
5 th arrondissement	852	60.2%
6 th arrondissement	910	74.9%
7 th arrondissement	1,084	65.7%
8 th arrondissement	635	69.3%
9 th arrondissement	807	36.8%
10 th arrondissement	1,386	23.0%
11 th arrondissement	2,207	36.6%
12 th arrondissement	898	25.6%
13 th arrondissement	1,263	23.2%
14 th arrondissement	1,021	38.8%
15 th arrondissement	2,394	33.0%
16 th arrondissement	2,188	50.6%
17 th arrondissement	1,737	30.3%
18 th arrondissement	3,076	26.6%
19 th arrondissement	1,852	14.5%
20 th arrondissement	1,271	19.2%

Notes: This table shows the number of purchases by foreigners in each arrondissement. It also shows the proportion of non-residents among foreign buyers.

Table 4: Crowding out by non-resident foreigners in desirable neighborhoods 1992–2011

% secondary residences in 1990	% purchases by non-resident foreigners	% purchases by resident foreigners	Total net inflow of non-resident foreigners	Years with strictly positive inflow of non-resident foreigners
$d = 1$	1.3%	6.8%	21	14
$d = 2$	1.3%	6.6%	38	11
$d = 3$	1.4%	4.6%	101	12
$d = 4$	1.5%	4.1%	116	14
$d = 5$	2.0%	4.2%	271	19
$d = 6$	2.1%	4.1%	268	17
$d = 7$	2.3%	3.7%	223	16
$d = 8$	2.7%	4.0%	337	17
$d = 9$	4.4%	3.7%	772	19
$d = 10$	8.3%	4.0%	999	20

Notes: This table shows the relative importance of non-resident and resident foreigners among all real estate buyers in neighborhood deciles sorted by the percentage of residences that were used as secondary residences in 1990. It also provides information on the net inflow (i.e., purchases minus sales) by non-resident foreigners in the different neighborhood desirability deciles.

Table 5: Crowding out by non-resident foreigners in desirable areas in good times

	(1)	(2)	(3)	(4)
Dependent variable:	Purchases non-resid. foreigners	Purchases non-resid. foreigners	Purchases resident foreigners	Purchases resident foreigners
$\ln Secondary_n \times Equities_{t-1}$	3.139 *** (1.088)	2.355 ** (0.959)	0.341 (1.346)	0.178 (1.195)
$\ln Secondary_n$	12.297 *** (0.262)		-2.743 *** (0.324)	
Neighborhood FE	No	Yes	No	Yes
Year FE	Yes	Yes	Yes	Yes
N	15,772	15,772	15,772	15,772
R^2	0.19	0.43	0.06	0.33

Notes: This table shows the results of a set of regressions with the number of purchases by non-resident or resident foreigners in neighborhood n in year t as the dependent variable. $Secondary_n$ equals one plus the percentage of residences in neighborhood n that were used as secondary residences in 1990. $Equities_{t-1}$ is the lagged return on the CAC40. Standard errors are below the coefficients. ***, **, and * denote statistical significance at the 1%, 5%, and 10% level, respectively.

Table 6: Non-resident foreigners pay more for the same property

	(1)	(2)	(3)
$(S_{i,t}^{NRF} - B_{i,t}^{NRF})$	-0.052 *** (0.003)	-0.049 *** (0.003)	-0.042 *** (0.003)
$(S_{i,t}^{NRF} + B_{i,t}^{NRF})$	0.020 *** (0.003)	0.008 *** (0.003)	0.009 *** (0.003)
$(S_{i,t}^{RF} - B_{i,t}^{RF})$		0.035 *** (0.002)	0.027 *** (0.002)
$(S_{i,t}^{RF} + B_{i,t}^{RF})$		-0.026 *** (0.003)	-0.025 *** (0.003)
Other buyer and seller controls	No	No	Yes
Hedonic characteristics	Yes	Yes	Yes
Neighborhood FE	Yes	Yes	Yes
Year FE	Yes	Yes	Yes
N	55,619	55,619	55,619
R^2	0.88	0.88	0.89

Notes: This table shows the results of a set of regressions with the log price of property i in year t as the dependent variable. $S_{i,t}^{NRF}$ (resp. $B_{i,t}^{NRF}$) is a dummy variable that equals one if the seller (resp. buyer) of the property is a non-resident foreigner. $S_{i,t}^{RF}$ (resp. $B_{i,t}^{RF}$) is a dummy variable that equals one if the seller (resp. buyer) of the property is a resident foreigner. “Other buyer and seller controls” are variables capturing gender, age, and marital status of the seller and the buyer. “Hedonic characteristics” are (log) floor level, (log) surface area (in m^2), dummy variables indicating the period of construction, and dummy variables indicating the presence of a parking place, an elevator, and a terrace. Standard errors are below the coefficients. ***, **, and * denote statistical significance at the 1%, 5%, and 10% level, respectively.

Table 7: Non-resident foreigners realize lower capital gains

	(1)	(2)
S_{i,y_2}^{NRF}	-0.013 *** (0.001)	-0.014 *** (0.001)
B_{i,y_2}^{NRF}	0.005 *** (0.001)	0.004 *** (0.001)
$Y_1 \times Y_2 \times E$	Yes	Yes
Arrondissement FE	No	Yes
N	34,204	34,204
R^2	0.18	0.18

Notes: This table shows the results of a set of regressions with the log annualized gross return on property i between purchase year y_1 and sale year y_2 as the dependent variable. S_{i,y_2}^{NRF} (resp. B_{i,y_2}^{NRF}) is a dummy variable that equals one if the seller (resp. buyer) of the property in year y_2 is a non-resident foreigner. $Y_1 \times Y_2 \times E$ is a triple interaction of purchase year, sale year, and neighborhood education level tercile dummies. Standard errors are below the coefficients, and are clustered at the arrondissement level in column (1). ***, **, and * denote statistical significance at the 1%, 5%, and 10% level, respectively.

Table 8: Inflow of non-resident foreigners is weakly correlated with higher prices

Panel A: Purchases by non-resident foreigners

	(1)	(2)	(3)	(4)	(5)
Sample:	All	French	All	All	All
$\ln Purchases_{n,y_1 \rightarrow y_2}^{NRF}$	0.005 ** (0.002)	0.003 (0.002)	0.002 (0.002)	0.003 (0.002)	0.000 (0.002)
S_{i,y_2}^{NRF}	-0.015 *** (0.002)	-0.014 *** (0.002)	-0.016 *** (0.002)	-0.016 *** (0.002)	-0.016 *** (0.002)
B_{i,y_2}^{NRF}	0.005 *** (0.001)		0.005 *** (0.001)	0.005 *** (0.001)	0.005 *** (0.001)
$\ln Secondary_n$				0.063 ** (0.029)	0.054 ** (0.026)
$Y_1 \times Y_2 \times E$	Yes	Yes	Yes	Yes	Yes
Arrondissement FE	No	No	Yes	No	Yes
N	24,655	20,910	24,655	24,654	24,654
R^2	0.15	0.14	0.15	0.15	0.15

Panel B: Lagged purchases by non-resident foreigners

	(1)	(2)	(3)	(4)	(5)
Sample:	All	French	All	All	All
$\ln Purchases_{n,y_1-1 \rightarrow y_2-1}^{NRF}$	0.006 *** (0.001)	0.005 ** (0.002)	0.002 (0.002)	0.004 * (0.002)	0.001 (0.002)
S_{i,y_2}^{NRF}	-0.016 *** (0.002)	-0.015 *** (0.002)	-0.016 *** (0.002)	-0.016 *** (0.002)	-0.016 *** (0.002)
B_{i,y_2}^{NRF}	0.006 *** (0.001)		0.005 *** (0.002)	0.006 *** (0.001)	0.005 *** (0.002)
$\ln Secondary_n$				0.060 ** (0.028)	0.048 * (0.027)
$Y_1 \times Y_2 \times E$	Yes	Yes	Yes	Yes	Yes
Arrondissement FE	No	No	Yes	No	Yes
N	23,461	19,885	23,461	23,460	23,460
R^2	0.13	0.13	0.13	0.13	0.13

Notes: This table shows the results of a set of regressions with the log annualized gross return on property i between purchase year y_1 and sale year y_2 as the dependent variable. $Purchases_{n,y_1 \rightarrow y_2}^{NRF}$ equals one plus the average annual number of purchases by non-resident foreigners in neighborhood n between y_1 and y_2 . S_{i,y_2}^{NRF} (resp. B_{i,y_2}^{NRF}) is a dummy variable that equals one if the seller (resp. buyer) of the property in year y_2 is a non-resident foreigner. $Secondary_n$ equals one plus the percentage of residences in neighborhood n that were used as secondary residences in 1990. $Y_1 \times Y_2 \times E$ is a triple interaction of purchase year, sale year, and neighborhood education level tercile dummies. Model (2) excludes purchases by non-resident foreign buyers. Standard errors are below the coefficients, and are clustered at the arrondissement level in columns (1) and (2). ***, **, and * denote statistical significance at the 1%, 5%, and 10% level, respectively.

Table 9: Inflow of non-resident foreigners drives up prices

Panel A: No control for % secondary residences

	(1)		(2)	
	Step 1	Step 2	Step 1	Step 2
$\ln Purchases_{n,y_1 \rightarrow y_2}^{NRF}$		0.049 *		0.056 **
		(0.029)		(0.028)
$\ln RelPurchases_{q,1992 \rightarrow 2001}^{NRF}$	33.250 ***		32.948 ***	
	(3.289)		(3.292)	
$FX_{q,y_1-1 \rightarrow y_2-1}$			-0.792 **	
			(0.392)	
$Y_1 \times Y_2 \times E$	Yes	Yes	Yes	Yes
Seller and buyer controls	Yes	Yes	Yes	Yes
Arrondissement FE	Yes	Yes	Yes	Yes
N	10,533	10,533	10,533	10,533
F -statistic	102.21		53.18	
R^2	0.47	0.05	0.47	0.04

Panel B: Control for % secondary residences

	(1)		(2)	
	Step 1	Step 2	Step 1	Step 2
$\ln Purchases_{n,y_1 \rightarrow y_2}^{NRF}$		0.053 *		0.058 *
		(0.032)		(0.032)
$\ln RelPurchases_{q,1992 \rightarrow 2001}^{NRF}$	29.970 ***		29.831 ***	
	(3.140)		(3.143)	
$FX_{q,y_1-1 \rightarrow y_2-1}$			-0.372	
			(0.375)	
$\ln Secondary_n$	5.080 ***	-0.216	5.074 ***	-0.238
	(0.159)	(0.171)	(0.159)	(0.171)
$Y_1 \times Y_2 \times E$	Yes	Yes	Yes	Yes
Seller and buyer controls	Yes	Yes	Yes	Yes
Arrondissement FE	Yes	Yes	Yes	Yes
N	10,532	10,532	10,532	10,532
F -statistic	91.12		46.05	
R^2	0.52	0.05	0.52	0.04

Panel C: Control for interactions between holding periods and % secondary residences

	(1)		(2)	
	Step 1	Step 2	Step 1	Step 2
$\ln Purchases_{n,y_1 \rightarrow y_2}^{NRF}$		0.048 *		0.052 *
		(0.029)		(0.029)
$\ln RelPurchases_{q,1992 \rightarrow 2001}^{NRF}$	33.460 ***		33.346 ***	
	(3.225)		(3.227)	
$FX_{q,y_1-1 \rightarrow y_2-1}$			-0.347	
			(0.380)	
$Y_1 \times Y_2 \times D$	Yes	Yes	Yes	Yes
Seller and buyer controls	Yes	Yes	Yes	Yes
Arrondissement FE	Yes	Yes	Yes	Yes
N	10,533	10,533	10,533	10,533
F -statistic	107.64		54.24	
R^2	0.54	0.09	0.54	0.08

Notes: This table shows the results of a set of 2SLS instrumental variable regressions with the log annualized gross return on property i between purchase year y_1 and sale year y_2 as the dependent variable in the second step. $(\ln)Purchases_{n,y_1 \rightarrow y_2}^{NRF}$ is the dependent variable in the first step, and equals one plus the number of purchases by non-resident foreigners in neighborhood n between y_1 and y_2 , annualized by dividing by $y_2 - y_1$. $RelPurchases_{q,1992 \rightarrow 2001}^{NRF}$ equals one plus the number of purchases by non-resident foreigners in area q between 1992 and 2001, scaled by dividing by the population of the area in 1990. Areas are larger than neighborhoods, but smaller than arrondissements. $FX_{q,y_1-1 \rightarrow y_2-1}$ equals the log annualized gross change in the weighted real exchange rate (foreign currency / euro) between 15 countries and France between $y_1 - 1$ and $y_2 - 1$, with the weights given by the relative importance of the different nationalities among the non-resident foreign buyers in area q between 1992 and 2001. Seller and buyer controls are dummy variables that equal one if the seller or buyer of the property in year y_2 is a non-resident foreigner. $Secondary_n$ equals one plus the percentage of residences in neighborhood n that were used as secondary residences in 1990. $Y_1 \times Y_2 \times E$ is a triple interaction of purchase year, sale year, and neighborhood education level tercile dummies. $Y_1 \times Y_2 \times D$ is a triple interaction of purchase year, sale year, and neighborhood desirability decile dummies, based on the percentage of residences that were used as secondary residences in 1990. Standard errors are below the coefficients. ***, **, and * denote statistical significance at the 1%, 5%, and 10% level, respectively.