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"We'll Always Have Paris"

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Presenter: Dragana Cvijanovic, Assistant Professor of Finance, Kenan-Flagler Business School University of North Carolina.

Discussant: Charlotte Ostergaard, Professor of Finance, BI Norwegian Business School

"We'll Always Have Paris": Out-of-Country House Buyers in a Global Hotspot

Dragana Cvijanovic and Christophe Spaenjers^{*}

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Abstract

This paper studies the investment decisions and price impact of non-resident foreigners in the Paris housing market, employing unique micro-level transaction data over the period 1992–2016. We find that these "out-of-country" households: (i) purchase relatively small but high-quality properties in desirable neighborhoods and in areas with high ratios of compatriots, (ii) buy when home-country economic conditions are favorable, and (iii) *ceteris paribus*, pay higher prices, realize lower capital gains, and hold for longer periods than local (French or foreign resident) buyers, pointing to the importance of search costs and information asymmetries in real estate markets. The results of a "shift-share" IV strategy suggest a strong effect of non-resident foreign demand on house prices.

Keywords: housing markets; non-resident demand; real estate investment; secondary residences. JEL Codes: R21; R23; R31; D12; G12.

^{*}Cvijanovic (dragana_cvijanovic@kenan-flagler.unc.edu) is at Kenan-Flagler Business School, University of North Carolina at Chapel Hill, CB3490 McColl Building, 27599 Chapel Hill, NC, United States. Spaenjers (spaenjers@hec.fr) is at HEC Paris, 1 rue de la Libération, 78351 Jouy-en-Josas, France. A previous version of this paper was called "Real Estate as a Luxury Good: Non-Resident Demand and Property Prices in Paris". The authors thank INSEE, Paris Notaires Services, and the Réseau Quetelet for help with the data collection, Robert Edelstein, Johan Hombert, Chris Mayer, Alexei Ovtchinnikov, Luis Quintero, David Thesmar, Benjamin Vignolles, and conference and seminar participants at ASSA/AREUA 2016, London School of Economics, and the University of Reading for valuable comments. We gratefully acknowledge financial support from Europlace Institute of Finance. All errors are ours.

1 Introduction

Housing in prime locations around the globe attracts individual investors seeking a safe haven, a portfolio diversifier, a "trophy asset" that signals power and sophistication, or just personal pleasure. As the inflow of foreign investment in residential real estate markets in major cities rises, market observers and policy makers increasingly express worries about its effects on housing affordability, in particular in places that are open to movement of capital and people from abroad.¹ While a recent and quickly-growing literature has studied international property investors and their effect on prices (e.g., Sá, 2017; Agarwal et al., 2018; Badarinza and Ramadorai, 2018; Badarinza et al., 2018), this body of work has not directly analyzed the decision-making and impact of individual cross-border buyers in housing markets. Instead, these papers either focus on institutional investors and commercial real estate, or infer foreign demand for residential real estate in an indirect and aggregate manner. None of this work employs data that identify the nationality or residence location of the ultimate investors. We fill this gap in the empirical literature, and use micro-level transaction and ownership data to study the investment decisions and price impact of non-resident foreign ("out-of-country") housing buyers in a world city. A more complete characterization of the drivers and nature of non-local demand for housing should also be helpful when building theoretical models that explore this demand's welfare effects (e.g., Favilukis and Van Nieuwerburgh, 2017).

The housing market that we study is that of Paris. We obtain detailed information on intrahousehold residential real estate transactions in the French capital between 1992 and 2016 from a comprehensive database of notarial deeds. Next to all transactions involving a foreign buyer or seller, we also obtain data for a ten percent random sample of all transactions for which

¹The Economist (2018) recently wrote that "cities are becoming less welcoming to foreign capital. Vancouver has made it harder for foreigners to buy property. Australia has increased property-transaction taxes for nonresidents. New Zealand is considering a ban on foreigners buying property."

both the buyer and seller are French. In total, our database covers 97,492 transactions over the 25-year sample period. For each transaction, we have data on the location and characteristics of the property, the transaction date and price (and in many cases the same information for the previous transaction), and some socio-economic characteristics (including nationality and residence status at the time of the transaction) of each buyer and seller.

From our database, we can conclude that purchases by non-resident foreigners (i.e., foreigners who do not live in France at the time of the transaction) account for more than one third of foreign purchases, and 2.8% of all purchases over our time period. These out-of-country buyers tend to be older and have a higher socio-economic status relative to French and especially resident foreign buyers. On average, they make more expensive purchases, and are more likely to use their property as a secondary residence than as a rental property, highlighting the luxury consumption aspect of their investments.

We find substantial variation in the relative importance of non-residents across buyer nationality groups. For example, we show that the majority of Swiss and Israeli buyers in Paris are non-residents, while very small fractions of Chinese and Portuguese buyers are. We also document substantial geographical variation in the importance of non-resident foreigners, with their importance in total purchase volume ranging from 1.0% in the outer twentieth district of Paris to 11.2% in the central fourth district.

We use this unique database to analyze the quality and locational characteristics of the properties bought by out-of-country households. Next, we examine these non-resident foreigners' macro-economic investment drivers. We also analyze whether their investment outcomes constant-quality purchase prices, capital gains upon resale, and holding periods—differ from those associated with "local" (French or foreign resident) investors. Finally, we study to which extent non-resident foreign demand affects housing prices using an instrumental variable approach. We start our empirical analysis by showing that, controlling for neighborhood fixed effects, non-resident foreigners do not buy more expensive properties. They buy higher-quality but smaller properties than French buyers. The substantially higher unconditional average prices paid by non-resident foreigners reflect these households' sorting into more desirable Parisian neighborhoods (especially as a location for a secondary residence). We also find that they are more likely to buy where households from the same country have historically made up a larger proportion of the population, even if the effect is not as strong as for resident foreigners.

Next, we analyze to which extent home-country macro-economic conditions affect foreign home purchases in Paris. Given the (luxury) consumption dimension of Paris property for outof-country households, we focus on variables that should affect potential buyers' purchasing power. We find evidence that economic growth in the home country positively affects nonresident foreign demand but not demand by foreigners already living in France. Home-country equity market returns and foreign exchange rates affect non-resident buying volume as well as resident foreign demand.

We find strong evidence that out-of-country buyers are paying higher amounts (keeping property characteristics fixed) and are realizing lower capital gains than other real estate market participants. Additionally, we find that they tend to have longer holding periods relative to resident foreigners and French buyers. Both findings are in line with the idea that non-resident foreign buyers face higher information asymmetries and search costs.

Finally, we try to identify impact of non-resident foreign demand on real estate prices in the French capital. We find a weak positive conditional correlation between the net inflow of "out-of-country" buyers and prices. By contrast, we do not find this relation for resident foreign demand. In order to address the possible endogeneity of (both resident and non-resident) foreign demand with respect to other omitted variables that generate house price growth, we use Bartikinspired instruments based on aggregate purchase volumes per nationality and nationalities' spatial distribution prior to our sample period, and based on the desirability of neighborhoods. Our results support a causal interpretation: we find that an increase in net "out-of-country" purchase volume has a positive effect on house prices. Not surprisingly, this effect is not present for resident foreign demand.

1.1 Related Literature

This paper contributes to two interconnected strands of literature. First, this paper is related to existing studies on the behavior of non-local buyers in housing markets. Chinco and Mayer (2016) study out-of-town buyers in American cities, and find that they realize lower capital gains than local buyers. Agarwal et al. (2018) study prices paid by foreign institutional investors in the commercial real estate market, and find that these are on average 3.6% higher than those paid by local investors. Both studies link the lower performance of non-local buyers to their informational disadvantages, highlighting the importance of information asymmetries in real estate markets (Kurlat and Stroebel, 2015).² A number of other recent papers tackle different dimensions of the decision-making of (potential) foreign house buyers. Badarinza and Ramadorai (2018) show how the demand for London houses is influenced by changes in political risk around the world as affected foreigners may look for a safe-haven investment or consider emigrating to London. Their empirical strategy relies on the assumption of the existence of a "home bias away from home", echoing previous research on immigrants (e.g., Åslund, 2005). Badarinza et al. (2018) show the existence of a "nationality bias", i.e., a preference to trade with compatriots, in global commercial real estate markets.

Second, there is a growing literature on the impact of real estate investment by non-residents

 $^{^{2}}$ Horenstein et al. (2017) show that one specific bias, the availability heuristic, can cause local investors to outperform out-of-town house buyers.

on house prices. Our paper relates most closely to Badarinza and Ramadorai (2018), who show that the capital flight in response to political and economic instability worldwide impacts housing prices in London. Sá (2017) uses data on properties owned by overseas companies to study the effect of foreign investment on the housing market in the UK. She finds that foreign investment is found to have a positive effect on local house price growth, with differential effects observed over the price distribution and more pronounced in highly inelastic areas. Chinco and Mayer (2016) find that their "misinformed speculators" from out-of-town drove up house prices in American cities in the mid-2000s. Favilukis and Nieuwerburgh (2017) develop a spatial equilibrium model of a city with substantial heterogeneity among residents and calibrate it to the New York and Vancouver metro areas. They find that the observed increase in out-of-town purchases is associated with 1.1% (5.0%) higher house prices in New York (Vancouver).³

2 Housing Transaction Data

The object of our study is the housing market in the French capital Paris.⁴ Figure 1 shows a map of the city. 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. As the city of Paris has about 2.3 million inhabitants, the average district has a population of over 100,000, but the districts vary widely in size and population. 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]

³A larger number of papers have studied the effects of immigration (e.g., Saiz, 2003, 2007; Cvijanovic et al., 2010; Saiz and Wachter, 2011; Gonzalez and Ortega, 2013; Sá, 2015) and international capital flows (e.g., Aizenman and Jinjarak, 2009; Jinjarak and Sheffrin, 2011; Favilukis et al., 2013) on housing markets.

⁴Our analysis focuses on transaction with the city itself ("intra muros"), not on the wider Paris region called "Ile-de-France".

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.⁵ We obtain detailed information on the 54,412 observed transactions of houses and apartments in Paris over the period 1992–2016 in which either the buyer or the seller (or both buyer and seller) was non-French. We only consider trades between households, and exclude those involving other types of investors,⁶ and limit ourselves to transactions for which the nationality status of both buyer and seller are known. Moreover, we obtain data on a random sample of ten percent of all transactions in which both the buyer and the seller were French households—a sample of 43,080 transactions. In total, our database thus contains information on 97,492 transactions over a 25-year period. Our data set contains detailed information on the levels of the property (address and quality characteristics), the transaction (most crucially the sale price, but in many cases also the purchase date and price), and the buyer and seller (most crucially nationality and residence status, but also some other demographic and socio-economic characteristics).

[Insert Table 1 about here]

Panel A of Table 1 shows the composition of our database in terms of buyer and seller nationality status (French or foreign), and the average transaction price for each combination of buyer and seller type. We see that average transaction prices range from 268,153 EUR (French buyer and French seller) to 308,566 EUR (French buyer and foreign seller). These unconditional averages are of course not controlling for the residence status of buyers and sellers, or the timing

⁵Each 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.

 $^{^{6}}$ While in London a large majority of foreign purchases occur through corporations (Badarinza and Ramadorai, 2018), this is not the case for Paris. In our data, less than 3% of foreign purchases of residential real estate are done by an institutional investor.

of transactions.

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 the cross-border consumption demand originating from foreigners, we rely on the residence status of the buyers. Panel B of Table 1 shows the residence location of both foreign and Fench buyers in our sample. We see that 51.2% of foreign buyers in our sample are already living in the City of Paris, 8.4% are located in the Paris region (Ile-de-France) excluding Paris, and a tiny fraction (2.9%) is located in the rest of France. This makes 62.4% of foreign buyers in our sample "resident foreigners", who actually live in France. We label the remaining 37.6% of foreign buyers, who reside outside of France, as "non-resident foreigners" or "out-of-country" buyers.⁷ The same table also shows that 96.7% of French buyers can be classified as residents; more than two thirds of this group already lives in the City of Paris.⁸ The remaining 3.3% of French buyers live abroad at the time of their property purchase. We do not classify these households as out-of-country buyers, and in most of our analysis will consider all French buyers (or sellers) as one category.⁹

Panel C of Table 1 compares the different buyer groups that will thus be the focus of most of our analysis: resident foreigners, non-resident foreigners, and Frenchmen. Non-residents foreigners account for only 2.8% of all purchases over our sample period, but more than one third of all

⁷The residence status of buyers and sellers in our database are determined by where they have their primary residence on the day of signing the deed with the notary. This implies that, for example, a buyer who currently resides outside of France but has the intention to move would still be classified as "non-resident". Yet, we can reasonably expect a small minority of foreigners purchasing from abroad to use the new property as a primary residence. We have data on the intended use (primary residence, secondary residence, or rental property) for about 7% of all purchases by non-resident foreigners, and about one third of that (small and potentially unrepresentative) sample indicate to plan to have their primary residence at the purchased property.

⁸Both here and below, our percentages and other descriptives are estimates that take into account that our database includes all transactions involving a foreigner but only a ten percent random sample of "French-French" transactions.

⁹Non-resident Frenchmen will on average have much tighter links to—and knowledge of—Paris than nonresident foreigners. They will also be much more likely to buy to use their Paris property as a (quasi-)primary residence. Purchases by this group can thus hardly be considered as a realization of "out-of-country" demand.

foreign purchases. The average age at the time of purchase is substantially higher for non-resident foreign ers (49.9 years) than for resident foreign buyers (42.7 years) or French buyers (43.1 years). 50.8% of non-resident foreign buyers can be classified as being part of a high socio-professional category (senior managers, liberal professions, scientists),¹⁰ while only 36.3% of foreign residents belong to this group. At the same time, 45.2% of French buyers have a high socio-professional status.

In Panel D of Table 1, we repeat this exercise for the seller population. Just like we saw for buyers, non-resident foreigner sellers tend to be older and more likely to be part of a high socioprofessional category. For about half of all observations in our data set, we have information on the past use (primary residence, secondary residence, or rental property) of the sold property, and for a majority of out-of-country sellers the property was used as a secondary residence. We also know the date of their purchase for nearly all sellers, and unconditional average holding periods are very similar across different seller groups (10.4 to 10.8 years).

Taken together, Panels C and D of Table 1 suggest that the non-resident foreign demand for real estate in Paris is primarily driven by older foreigners with high socio-economic status looking to buy a vacation home. While property in certain global hotspots such as London have traditionally been viewed as a "safe-haven investment" (Badarinza and Ramadorai, 2018), Paris may be an example of a city where financial considerations are not the first things on out-of-country buyers' minds.

Panels A and B of Figure 2 depict the evolution of the average purchase price and sale price for the different buyer and seller groups over our sample period. The graph illustrates the sharp rise in housing prices in Paris over the last two decades, in particular over the 1999–2006 and 2009–2017 periods. Panel A also shows a stark difference in the average price levels at which non-

 $^{^{10}}$ The database uses the socio-professional categorization of the French statistical office INSEE. It includes nine main groups; we here refer to group 3 ("cadres et professions intellectuelles supérieures").

resident foreigners buy compared to resident foreigners and Frenchmen. Panel B interestingly shows that average sales prices were more similar across seller groups.

[Insert Figure 2 about here]

Next, we analyze our data in terms of the observed patterns across buyer nationalities and across Paris districts. Panel E of Table 1 shows the twenty 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 China. As shown in Panel E, Israeli buyers have the highest ratio of non-resident purchases (78.4%), followed by Swiss (69.6%) and American (59.8%) buyers. These numbers are much lower for Portuguese (3.5%) and Chinese (6.1%) buyers.

In Panel C of Figure 2, we plot the average purchase price by the top-five nationalities in our sample. The graph shows that the highest average purchase prices were paid by American and British buyers.

We now turn to the geographical spread of foreign purchases. Panel F of Table 1 shows the total number of observations in our sample and the average transaction prices for each district. The table also shows the estimated relative importance of resident foreigners and non-resident foreigners in the buyer population by district. Not surprisingly, the percentages of out-of-country purchases are very high for the 1^{st} , 4^{th} , 6^{th} , 7^{th} and the 8^{th} district, with the Louvre, the Marais, the Jardin du Luxembourg, the Eiffel Tower, and the Arc de Triomphe respectively. The proportions are much lower for cheaper and less central districts, such as the 12^{th} , 19^{th} , and 20^{th} districts. On the other hand, for resident foreign buyers, the 10^{th} , the 18^{th} , and the 19^{th} district seem to be the most popular, which are locations not known as the usual tourist destinations. We will look at locational sorting in more depth in the next section.

3 Results

The questions that we will answer in this section are the following ones. First, what are the characteristics of the properties that non-resident foreigners buy? Second, what home-country economic conditions drive them to buy? Third, do out-of-country buyers realize different investment outcomes than other buyer groups (resident foreigners and French nationals)? Fourth, what is the impact of their buying on housing price levels?

3.1 Properties purchased by out-of-country households

3.1.1 Prices, locational choices, and property characteristics

We first study how the properties purchased by non-resident foreigners differ from those bought by other market participants. Figure 2 showed that out-of-country buyers pay higher prices on average. We can quantify the price differential by estimating the following equation:

$$\ln P_{i,t} = \alpha + \beta_1 B_{i,t}^{RF} + \beta_2 B_{i,t}^{NRF} + \gamma_t + \varepsilon_{i,t}, \tag{1}$$

where $P_{i,t}$ is the price on property *i* transacted in year *t* and γ_t are year fixed effects. $B_{i,t}^{RF}$ and $B_{i,t}^{NRF}$ are dummy variables that equal one if the buyer is a resident foreigner or non-resident foreigner, respectively. We show the results of an OLS estimation of equation (1) in the first column of Table 2.

[Insert Table 2 about here]

We find that out-of-country buyers on average pay almost 20% more than French buyers. (Resident foreigners buy substantially *less* expensive properties.) A natural question to ask is to which extent this price gap can be explained by the location and/or other quality characteristics of the properties that non-resident foreigners buy? To explore this issue, we first repeat the estimation of equation (1), but now adding a detailed geographical control variable. To do this, we use fixed effects for all "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).¹¹ The results are shown in the second column of Table 2. We see that, once controlling for location, there is no longer a statistically significant difference in price with the average prices paid by Frenchmen. So out-of-country households choose more expensive neighborhoods, but not more expensive properties *within* each neighborhood. (By contrast, the coefficient for resident foreigners goes up, meaning that they sort in less expensive neighborhoods.) Column 3 then repeats the model from column 2 but now with price per square meter as the dependent variable. Interestingly, we find that non-resident foreigners are associated with a significantly higher price-per-area ratio. Taken together, the results in the second and third column imply that out-of-country households buy smaller but higher-quality properties.¹²

An alternative explanation for the results in columns 1 and 3 is that non-resident foreigners do not buy more expensive and higher-quality properties, but pay higher prices than other types of buyers *keeping property location and characteristics fixed*. This is in itself a conjecture that we will test in depth later in this section. However, to rule out that this story fully drives our results here, we estimate different variations of the following model for all properties that were *sold* in year t by a French national and for which we have the previous transaction price (i.e.,

¹¹The 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.

¹²The conclusion that they buy smaller properties is also confirmed by models in which we regress variables measuring property surface or number of rooms against buyer group dummy variables (details available on request).

the price at which the French national *bought* the property):

$$\ln P_{i,s} = \alpha + \beta_1 B_{i,t}^{RF} + \beta_2 B_{i,t}^{NRF} + \gamma_s + \varepsilon_{i,s}, \qquad (2)$$

where $P_{i,s}$ indicates the price of property *i* in the *previous* transaction year *s* and γ_s are fixed effects for this previous transaction year. The coefficients β_1 and β_2 should now solely pick up quality differences in the properties bought by resident and non-resident foreigners in year *t*. The results are shown in columns 4–6, repeating the same specifications as in column 1–3. The results in column 4 confirm that non-resident foreigners buy more expensive properties than other buyer groups. In column 5, we see that β_2 turns negative, meaning that out-of-country households tend to buy slightly *cheaper* properties when keeping the location constant. However, we still find that β_2 is positive in column 6, which confirms that out-of-country buyers buy *higher-quality* properties within each neighborhood.

3.1.2 Desirable neighborhoods

The results in Table 2 point to a sorting of out-of-country individuals into more expensive neighborhoods. We now study this sorting in more depth. In Panel A of Table 3, we show the relative distribution of buyers *within* buyer groups and *across* deciles of neighbourhoods ranked along a number of dimensions measuring the *ex ante* desirability of neighborhoods. In the first three columns, we rank neighborhoods by their year-1990 education level, and more specifically the percentage of adults with a higher education degree according to census data of the French statistical office INSEE. As we can expect higher-educated households to "outbid" lower-educated households in the real estate market, this variable can be considered as a proxy for the attractiveness of a neighborhood.¹³ In the next set of columns, we use price data directly,

¹³We find similar results when using year-2001 median income data to classify neighborhoods.

by ranking neighborhoods on their average price per square meter over the first five years of our sample period (1992–1996) using the transactions in our data set. (The distributions are now computed using post-1996 data only.) In the final three columns, we show a spread across neighborhood deciles of the year-1990 ratio of secondary residences (owned by both Frenchmen and foreigners), again using census data from INSEE. Even more than education (or income) levels or prices, which are mainly determined by the locational choices of locals, the ratio of secondary residences may pick up how desirable a neighborhood is as the location for a vacation home.

[Insert Table 3 about here]

The results in this panel show a sorting of non-resident foreign buyers into the most attractive areas. Irrespective on the attactiveness criterion on which neighborhoods are ranked, we see the highest proportion of non-resident buying in the top decile. A very different pattern is observed for French and especially resident foreign buyers.

In Panel B, we present the same data in a slightly different way, namely as distributions *across* buyer types and *within* deciles of neighbourhood rankings. So while in Panel A of Table 3 the columns sum up to one, in Panel B the rows sum up to one. Not surprisingly, we find that the fraction of non-resident foreign buyers tends to increase with the ranking of the neighbourhood, irrespective of the ranking criterion used.

3.1.3 Preferred habitats

In analyzing the effect of foreign political risk on housing prices in London, Badarinza and Ramadorai (2018) rely on a "preferred-habitat" identification strategy based on the assumption that foreign real estate buyers exhibit "home bias abroad" and buy in areas of the destination city with an already high concentration of home-country residents, even if they do not plan to move in the short run. (It has been shown before that immigrants are attracted to regions with a high ratio of compatriots (e.g., Aslund (2005).) Under this hypothesis we would, for example, expect to see a higher volume of both non-resident and resident Italian purchases in areas of Paris with higher fractions of Italians ex ante (relative to other areas). Combining our data with year-1982 district-level census data from INSEE,¹⁴ we can test this hypothesis empirically. In particular, we estimate the following panel OLS specification for the top-20 buyer nationality groups in our sample for both resident and non-resident foreign buyer groups:

$$Purchases_{d,c}^{1992-2016} = \alpha + \beta_1 Households_{d,c}^{1982} + \delta_d + \eta_c + \varepsilon_{d,n}, \tag{3}$$

where $Purchases_{d,n}^{1992-2016}$ denotes the number of purchases by nationality c in district d in our database, $Households_{d,c}^{1982}$ is the number of household heads of nationality c living in district d in the year 1982, and γ_d and η_c are district and nationality fixed effects respectively. The results are shown in Table 4.

[Insert Table 4 about here]

As we can see, the initial share of residents of a certain nationality in 1982 is positively correlated with the relative inflow of same-nationality buyers in later periods. The relation is present both for resident foreigners and non-resident foreigners. However, the estimated coefficient β_1 is substantially smaller in the case of non-resident foreign demand. These results suggest that "preferred habitats" are relevant for both resident and non-resident foreign demand, although it may be a stronger force for the former.

 $^{^{14}}$ An advantage of using data from 1982 is that the distribution of owner nationalities (a stock measure for 1982) on the one hand and purchase volume (a flow measure over 1992–2016) on the ohter hand are unlikely to be correlated because of some short-run dynamics affecting certain nationalities in certain districts over a short period of time.

3.2 Drivers of purchase decisions

We now turn to analyzing the main drivers of foreign buyers' purchase decisions. The evidence presented so far highlights the luxury consumption dimension of Paris property for out-of-country households. We therefore focus on variables that should affect potential buyers' purchasing power, inspired by the literature modeling demand for luxury durable assets (e.g., Aït-Sahalia et al., 2004; Goetzmann et al., 2011; Lovo and Spaenjers, 2018). More specifically, we study how purchase volume by resident and non-resident foreigners in Paris is driven by home-country economic growth (as proxied by GDP growth), asset returns (as proxied by equities), and changes in exchange rates.¹⁵

We perform the following panel OLS regression explaining growth in the number of purchases by different buyer groups both for resident and for non-resident foreigners:

$$\Delta \ln(Purchases_{c,t}) = \alpha + \beta_1 GDP_{c,t-1} + \beta_2 Equities_{c,t-1} + \beta_3 FX_{n,t-1} + \varepsilon_{c,t}, \tag{4}$$

where $\Delta \ln(Purchases_{c,t})$ is the log change in the number of purchases by nationals of country cbetween year t - 1 and t, $GDP_{c,t-1}$ and $Equities_{c,t-1}$ are the lagged real GDP growth rate and real equity return for the same country, and $FX_{c,t-1}$ is the lagged real change in the exchange rate relative to France (so that positive values indicate that the "foreign currency" gains value relative to the French franc or euro). GDP data come from the World Bank, while exchange rate and equity return data are taken from Bloomberg.¹⁶ We limit the analysis to cases where

¹⁵Ruf 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 may matter for the Paris housing market as well. For 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".

¹⁶The only exception is Algeria, for which equity data were collected from the website of the Bourse d'Alger (http://www.sgbv.dz).

we observe at least ten purchases in year t - 1. The results are reported in columns 1 and 3 of Table 5. Columns 2 and 4 add year fixed effects.

[Insert Table 5 about here]

Purchases by both resident and non-resident foreigners go up when the foreign currencies appreciate—and buying in Paris thus becomes more affordable for foreign households who have savings denominated in their "home country" currency. Real home country equity returns also correlates positively with both resident and non-resident foreign purchases when not controlling for year fixed effects, and thus helps explaining time-series variation in foreign purchase volume. (The cross-country correlation in equity returns is relatively high, which could explain why the significance goes away once including year fixed effects.) Finally, Table 5 shows that economic growth in the home country is positively and significantly correlated with the number of purchases by non-resident foreigners. However, this is not the case for resident foreigner purchases in Paris.

3.3 Investment outcomes

3.3.1 Purchase prices and capital gains

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 pay more (for identical properties) than other buyer groups in the Paris real estate market. Previous studies have shown that worse-informed real estate investors pay a premium (e.g, Kurlat and Stroebel, 2015). If out-of-country households face higher search costs, then this may also lead to higher purchase and lower resale prices (Turnbull and Sirmans, 1993). Finally, wealthier housing market participants are likely to have less bargaining power (Harding et al., 2003) and higher private valuations (Lovo and Spaenjers, 2018), and therefore to pay more at purchase and to realize lower capital gains upon resale. Measuring how market participant characteristics relate to constant-quality price levels is not straightforward using hedonic methods applied to single transactions, as preferences may be correlated with characteristics (Harding et al., 2003).¹⁷ However, as we have information on the *previous* transaction price for more than half of the transactions in our database (even if it took place before 1992), we can explicitly control for unobservable property characteristics that might be driving our results. More specifically, we can run a regression of the following form using data on all properties for which we observe both a purchase price and a resale price:

$$\ln R_{i,s,t} = \alpha + \beta_1 S_{i,t}^{RF} + \beta_2 S_{i,t}^{NRF} + \beta_3 B_{i,t}^{RF} + \beta_4 B_{i,t}^{NRF} + \gamma_{s,t} + \delta_n + \varepsilon_{i,s,t},$$
(5)

where $R_{i,s,t}$ is the annualized gross capital gain on property *i* between year *s* and year *t*. $S_{i,t}^{(N)RF}$ and $B_{i,t}^{(N)RF}$ are dummy variables that equal one if the seller or the buyer at the time of the resale *t* is a (non-)resident foreigner, respectively. The year fixed effects $\gamma_{s,t}$ equal one for each year after *s* and until *t* so that they indicate the holding period, just like in a standard repeat-sales set-up, and δ_n indicates that we have neighborhood fixed effects in each specification. If out-of-country households pay more at purchase, and are realizing lower capital gains at resale, we should expect β_4 to be positive (on average, a higher capital gain is realized when reselling to a non-resident foreigner) and β_2 to be negative (on average, a lower capital gain is realized when a non-resident foreigner is reselling). The results of the OLS estimation of equation (5) is shown in column 1 of Panel A of Table 6.¹⁸

[Insert Table 6 about here]

¹⁷Non-resident foreigners may pay higher average prices even after controlling for a number of observable property characteristics (i) because they are indeed paying a premium related to information asymmetries, search costs, or differences in bargaining power, (ii) because they buy houses of higher quality along some unobservable dimension, or (iii) because of a combination of (i) and (ii).

 $^{^{18}}$ We winsorize the annualized capital gains at the 1^{st} and 99^{th} percentile. We also limit our sample to holding periods of at most 40 years.

We find that non-resident foreigners indeed realize significantly lower capital gains. The annualized capital gain is lowered by almost two percentage points on average, so the effect is also economically meaningful. (Importantly, we keep the holding period constant here; ours is thus not a result about timing of exit as in Chinco and Mayer (2016).) Furthermore, capital gains realized by all owners are higher if they resell to a non-resident foreigner.

The baseline model presented in equation (5) and estimated in column 1 of Panel A of Table 6 is gradually expanded in columns 2 until 4 of the same panel. In column 2, we add interactions between the holding period yearly dummy variables $\gamma_{s,t}$ and a variable measuring the percentage of adults with a higher education degree in the property's neighborhood (measured in 1990, so before the start of our time frame). We do this in order 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. In column 3, we restrict ourselves to those properties for which we have information on how the seller used the property (primary residence, secondary residence, or rental property) and include dummy variables for the type of use. In column 4, we add additional variables related to the socio-demographic characteristics of the seller, namely age, a dummy variable for gender, a dummy variable for the marital status, and dummy variables for the socio-professional group (where we use the same categorization that we relied on before, which has nine groups). The coefficients are substantially smaller in columns 3–4, but remain statistically significantly different from zero. This suggests that differences in bargaining power and private valuations associated with being a relatively wealthy secondary-residence buyer play a role in explaining price differences, but are not the only factors.

In Panel B of Table 6, we repeat the analysis using a wider range of seller group variables, to see if we can say more on the relative importance of the information asymmetries and search costs in generating different price outcomes for out-of-country buyers. We now use a separate dummy variable for each combination of seller nationality status (French or foreign) and residence status (Paris, Parisian region, rest of France, or abroad). We see that the realized capital gains are generally lower if the seller lives further away from Paris, both for French and for foreign sellers. Interestingly, we do not see much difference between non-resident French nationals and nonresident foreigners in their realized capital gains. This suggests that information asymmetries are not the only force driving our results, as we could expect French nationals to be better informed about the Paris real estate market than foreigners, even when living abroad. So search costs are probably important as well.

3.3.2 Holding periods

To validate that search costs are indeed important, we compare holding periods between different buyer groups. We estimate the following equation:

$$H_{i,s,t} = \alpha + \beta_1 S_{i,t}^{RF} + \beta_2 S_{i,t}^{NRF} + \gamma_s + \delta_n + \varepsilon_{i,s}, \tag{6}$$

where now the dependent variable is the realized holding period on property i bought in year sand sold in year t, i.e., t-s. We include purchase year fixed effects. The results of the estimation of equation (6) is shown in column 1 of Panel A of Table 7. The other columns add additional controls in identical fashion to the previous table. Panel B again repeats the specifications from Panel A with more granual information on seller nationality and residence status.

[Insert Table 7 about here]

The results in Panel A of Table 7 show that both resident and especially non-resident foreigners have longer holding period relative to French buyers. Panel B shows that the holding periods also are higher for French nationals living abroad, but there is still a gap with foreigners who don't live in the Parisian region.

3.4 Foreign buying volume and price trends

3.4.1 Conditional correlations

A final question is what is the impact of purchases by resident or non-resident foreigners on real estate prices in the French capital? In a first step, we are interested in establishing conditional correlations, and we expand equation (5) as follows:

$$\ln R_{i,s,t} = \alpha + \delta_1 Inflow_{n,s\to t}^{RF} + \delta_2 Inflow_{n,s\to t}^{NRF} + \text{controls} + \varepsilon_{i,s,t}, \tag{7}$$

where $Inflow_{n,s\to t}^{(N)RF}$ equals the average annual net inflow, measured as the number of purchases minus sales, of (non-)resident foreigners between years s and t. If the coefficient δ_2 is positive, then higher capital gains are realized on properties in neighborhoods that have seen more purchases by out-of-country households over the holding period.

The results of the estimation of equation (7) are shown in Table 8. We no longer control for neighborhood fixed effects, as it would be difficult to achieve identification based on the withinneighborhood variation in inflows, especially given that holding periods may overlap. However, we do control for buyer and seller group fixed effects, the time period over which the property was held, and the interaction between that holding period and the year-1990 neighborhood education level. In column 2 we add district fixed effects as an additional geographical control, and also the year-1990 ratio of secondary residences in the neighborhood, which should mitigate concerns that our effects are driven by different price appreciation rates in areas that happen to be more attractive for out-of-country households. In columns 3 and 4, we repeat the specifications of the first two columns, but now only using data on transactions between French households. This allows us to check whether there is a spill-over price impact even for domestic investors, and mitigates concerns that our results are mechanically driven by overpaying on the part of non-resident foreigners.

[Insert Table 8 about here]

Columns 1–2 in Table Table 8 show highly significant—but in terms of economic magnitude relatively low—positive conditional correlation between the volume of purchases by non-resident foreigners (but not resident foreigners) and price changes. The coefficient of 0.0014 in column 2 suggests that an increase by one in the annual net purchase volume by non-resident foreigners in a neighbourhood is associated with 0.1% change in neighborhood prices. When we repeat these specifications on transactions that only involve French buyers and sellers, we get very similar coefficients, but the statistical significance disappears, which is not surprising given the much smaller sample.

3.4.2 Instrumental variable 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 in the attractiveness of the neighborhood to foreigners. To solve this endogeneity problem, we need to find an exogenous source of cross-sectional variation in the number of purchases by non-resident foreigners, so that we can implement an instrumental variables approach.

Inspired by previous work on the effects of immigration on housing markets (e.g., Saiz, 2007,

Gonzalez and Ortega, 2013), our instruments predict actual inflows of non-resident foreigners into the different districts of Paris by allocating the *aggregate* inflow of non-resident foreigners over a period to the districts based on historical settlement patterns. Each area is thus assigned a "share" of total inflow based on pre-existing networks, which is motivated by the observation that, all else equal, foreigners tend to buy where their countrymen have bought before (cf. supra).

We instrument $Inflow_{n,s\to t}^{RF}$ and $Inflow_{n,s\to t}^{NRF}$ using three variables. The first two instruments, which we can denote by $Share_{d,s\to t}^{RF}$ and $Share_{d,s\to t}^{NRF}$ are Bartik-style shift-share variables constructed as follows. First, we consider for each nationality how households of this nationality were distributed over the twenty districts in Paris in 1982 using census data from INSEE. Second, for each year over our sample period 1992-2016 and for each nationality, we allocate the total resident or non-resident foreign inflow to the different districts based on the geographical spread from the first step. Third, we sum the predicted inflows over all nationalities. Finally, we divide by the year-1982 population in the district. The result is that these instrumental variables will take a high value for all neighborhoods in a given district in a given year if in that year there is a high inflow in Paris of resident or non-resident foreigners from countries that were highly represented in that district in 1982.

To isolate exogenous variation in *non-resident demand*, we create a third instrument as follows. We interact $Share_{d,s\rightarrow t}^{NRF}$ with the the proportion of secondary residences in the neighborhood (in year 1990) to create a neighborhood-level instrumental variable. As indicated in our earlier analysis, our data suggest a strong positive correlation between the desirability of a neighbourhood (as measured by the number of secondary residences in 1990) and the proportion of non-resident foreign buyers over 1992–2016. Importantly for our IV analysis, this correlation does not seem to be present for resident foreign buyers.

We thus perform a 2SLS analysis. In the first stage we have two endogenous variables:

 $Inflow_{n,s \to t}^{RF}$ and $Inflow_{n,s \to t}^{NRF}$; and three instruments: $Share_{d,s \to t}^{RF}$, $Share_{d,s \to t}^{NRF}$, and $Share_{d,s \to t}^{NRF} \times Secondary_n$, as described above. The second stage is similar to the (most comprehensive) model specifications we had in Table 8.

Table 9 shows the results of our 2SLS analysis. Columns 1–3 show the estimation results on the full sample, while columns 4–6 limit the sample to transaction that involve only French buyers and French sellers. The results of the first stage are shown in column 1–2 and columns 4–5, for the full and for the French sample respectively, while the results of the second stage are shown in columns 3 and 6.

[Insert Table 9 about here]

The first-stage results show that we can predict neighbourhood-level (non-)resident inflows during the 1992–2016 period well by using the residence locations of foreigners in 1982 (interacted with the relative desirability of each neighbourhood). The second-stage results are highly significant and an order of magnitude larger than the OLS estimates reported in 8.¹⁹

Overall, the results shown in this section suggest that purchases by non-resident foreigners have a causal positive effect on house prices.

4 Conclusion

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

¹⁹This can be an indication of a measurement error in the net inflow of (non-)resident foreigners, which biases the OLS estimate of the treatment effect toward zero. Since the IV estimate is unaffected by the measurement error in the treatment variable, they tend to be larger than the OLS estimates. Additionally, while the OLS estimate describes the average difference in house prices across neighbourhoods, the IV estimate is measuring the effect of increasing non-resident foreigner inflow only for the (treatment) neighbourhoods which were affected by the instrument (the ones with the highest number of secondary residence prior to the estimation sample).

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.

References

- Agarwal, Sumit, Tien Foo Sing, and Long Wang, 2018. Information asymmetries and learning in commercial real estate markets. Working paper.
- Aizenman, Joshua, and Yothin Jinjarak, 2009. Current account patterns and national real estate markets. Journal of Urban Economics 66, 75–89.
- Aït-Sahalia, Yacine, Jonathan A. Parker, and Motohiro Yogo, 2004. Luxury goods and the equity premium. Journal of Finance 59, 2959–3004.
- Åslund, Olof, 2005. Now and forever? Initial and subsequent location choices of immigrants. Regional Science and Urban Economics 35, 141–165.
- Badarinza, Cristian, and Tarun Ramadorai, 2018. Home away from home? Foreign demand and London house prices. Journal of Financial Economics, forthcoming.
- Badarinza, Christian, Tarun Ramadorai, and Chihiro Shimizu, 2018. Nationality bias at home and abroad: Theory and evidence from commercial real estate. Working paper.
- Chinco, Alex, and Christopher Mayer, 2016. Misinformed speculators and mispricing in the housing market. *Review of Financial Studies* 29, 486–522.
- Cvijanovic, Dragana, Jack Favilukis, and Christopher Polk, 2010. New in town: Demographics, immigration, and the price of real estate. Working paper.
- Favilukis, Jack, David Kohn, Sydney C. Ludvigson, and Stijn Van Nieuwerburgh, 2013. International capital flows and house prices: Theory and evidence. In: Edward L. Glaeser and Todd Sinai (eds.), *Housing and the Financial Crisis* (NBER and University of Chicago Press), 235–299.
- Favilukis, Jack, and Stijn Van Nieuwerburgh, 2017. Out-of-town home buyers and city welfare. Working paper.

- Goetzmann, William N., Luc Renneboog, and Christophe Spaenjers, 2011. Art and money. American Economic Review (Papers and Proceedings) 101, 222–226.
- Gonzalez, Libertad, and Francesc Ortega, 2013. Immigration and housing booms: Evidence from Spain. Journal of Regional Science 53, 37–59.
- 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.
- Horenstein, Alex R., Daniel Osgood, and Avichai Snir, 2017. Out-of-town buyers, mispricing, and the availability heuristic in a housing market. *Real Estate Finance* 34, 27–35.
- Kurlat, Pablo, and Johannes Stroebel, 2015. Testing for information asymmetries in the real estate market. Review of Financial Studies 28, 2429–2461.
- Jinjarak, Yothin, and Steven M. Sheffrin, 2011. Causality, real estate prices, and the current account. Journal of Macroeconomics, 33, 233–246.
- Lovo, Stefano, and Christophe Spaenjers, 2018. A model of trading in the art market. American Economic Review 108, 744–774.
- 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.
- Sá, Filipa, 2015. Immigration and house prices in the UK. The Economic Journal 125, 1393–1424.
- Sá, Filipa, 2017. The effect of foreign investors on local housing markets: Evidence from the UK. Working paper.
- Saiz, Albert, 2003. Room in the kitchen for the melting pot: Immigration and rental prices. Review of Economics and Statistics 85, 502–521.

- Saiz, Albert, 2007. Immigration and housing rents in American cities. Journal of Urban Economics 61, 345–371.
- Saiz, Albert, and Susan Wachter, 2011. Immigration and the neighborhood. American Economic Journal: Economic Policy 3, 169–188.

The Economist, 2018. Housing Correction. 11 August 2018.

Turnbull, Geoffrey K., and C.F. Sirmans, 1993. Information, search, and house prices. Regional Science and Urban Economics 23, 545–557.

Wall Street Journal, 2013. A Pied-à-Terre Buying Guide in Three Glamorous Cities. 7 November 2013.



Figure 1: A map of Paris indicating the 20 districts ("arrondissements")

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Figure 2: Yearly average price levels





Table 1: Composition of data set and descriptive statistics

	N	Avg. price (EUR)
Foreign buyer & French seller	31,862	288,542
French buyer & foreign seller	$18,\!693$	308,566
Foreign buyer & foreign seller	$3,\!857$	$306,\!579$
French buyer & French seller $(10\% \text{ sample})$	$43,\!080$	$268,\!153$

Panel A: Composition of data set

Panel B: Residence location of buyers and sellers

	Foreign	French	Foreign	French
	buyers $(\%)$	buyers $(\%)$	sellers $(\%)$	sellers $(\%)$
City of Paris	51.2	67.1	43.6	60.6
Parision region (Ile-de-France) ex Paris	8.4	18.2	7.4	16.6
Rest of France	2.9	11.4	3.8	19.2
Abroad ("non-resident")	37.6	3.3	45.2	3.6

Panel C: Comparison of buyer groups

			% high socio
	Buyers $(\%)$	Avg. age	-profess. cat.
Resident foreigners	4.6	42.7	36.3
Non-resident foreigners	2.8	49.9	50.8
French	92.6	43.1	45.2

Panel D: Comparison of seller groups

			% high socio	% declared use as	Avg. holding
	Sellers $(\%)$	Avg. age	-profess. cat.	secondary resid.	period (years)
Resident foreigners	2.5	53.8	29.5	9.6	10.4
Non-resident foreigners	2.1	59.2	37.6	54.3	10.4
French	95.4	55.5	32.3	17.5	10.8

	N	Avg. price (EUR)	% non-resident
Italy	5,844	302,477	51.9
Great Britain	$3,\!031$	$319,\!629$	47.7
United States	$2,\!692$	414,600	59.8
Portugal	$2,\!230$	$154,\!826$	3.5
China	2,075	$221,\!667$	6.1
Algeria	$1,\!945$	$190,\!596$	22.4
Germany	1,729	283,759	36.5
Spain	$1,\!480$	$237,\!969$	22.4
Morocco	$1,\!352$	$220,\!614$	31.7
Belgium	$1,\!065$	343,204	41.0
Tunesia	1,022	$187,\!829$	19.0
Switzerland	772	$327,\!583$	69.6
Lebanon	634	477,117	56.5
Japan	615	$253,\!811$	24.7
Ireland	569	266,194	58.7
Canada	478	410,215	49.5
Iran	474	$282,\!986$	33.5
Russia	441	448,204	44.8
Israel	422	175,076	78.4
Netherlands	405	$332,\!688$	42.2

Panel E: Top-twenty of foreign buyer nationalities

Panel F: Paris districts

	N	Avg. price (EUR)	% res. for.	% non-res. for.
District 1	1,056	354,970	4.9	8.3
District 2	$1,\!551$	281,500	4.5	5.5
District 3	2,901	300,183	5.1	7.4
District 4	2,261	344,888	4.6	11.2
District 5	2,763	$317,\!296$	3.7	5.0
District 6	2,533	$512,\!381$	3.6	9.2
District 7	$3,\!133$	$563,\!380$	4.2	7.7
District 8	$1,\!944$	$550,\!349$	3.9	7.7
District 9	$3,\!310$	$295,\!154$	4.2	2.2
District 10	$5,\!105$	211,213	5.8	1.7
District 11	$8,\!477$	$207,\!506$	4.5	2.4
District 12	4,510	229,901	3.5	1.1
District 13	4,901	$217,\!224$	5.1	1.5
District 14	$4,\!602$	$254,\!390$	3.5	2.0
District 15	9,743	$270,\!170$	4.4	2.1
District 16	8,010	$517,\!559$	4.4	4.2
District 17	7,704	$283,\!905$	3.9	1.6
District 18	$11,\!128$	$175,\!420$	5.3	1.8
District 19	5,865	190,225	7.1	1.2
District 20	$5,\!941$	184,890	4.2	1.0

Table 2: Prices, locational choices, and property characteristics

Columns 1 of this table reports the results of the OLS estimation of equation (1) using the natural log of the transaction price as the dependent variable. Column 2 adds neighborhoods fixed effects. Columns 3 repeats the estimation of column 2 using the natural log of the transaction price divided by the surface area in square meters. Columns 4 until 6 repeat the estimation of columns 1 until 3 but using the previous transaction price, following equation (2). *, **, and *** denote statistical significance at the 10%, 5%, and 1% level, respectively.

	(1) Price	(2) Price	(3) Price/m^2	(4) Prev. price	(5) Prev. price	(6) Prev. price $/m^2$
Buyer: resident foreigner	-0.1570 *** (0.0059)	-0.1117 *** (0.0052)	-0.0537 *** (0.0021)	-0.1206 *** (0.0080)	-0.0901 *** (0.0072)	-0.0359 *** (0.0046)
Buyer: non-resident foreigner	0.1953 *** (0.0072)	-0.0068 (0.0066)	0.0523 *** (0.0027)	0.1429 *** (0.0099)	-0.0425 *** (0.0093)	0.0191 *** (0.0060)
Year fixed effects	Yes	Yes	Yes	No	No	No
Prev. year fixed effects	No	No	No	Yes	Yes	Yes
Neighborhood fixed effects	No	Yes	Yes	No	Yes	Yes
Ν	97,098	96,863	79,144	$59,\!485$	59,339	50,564

Panel A: 1	Distributi	on of buye	srs (%) within bu	lyer types	and across	deciles of neighbori	hoods ranked by		
	Year	-1990 educ	cation level	Average	price/ m^2 (over 1992–1996	Year-1990 r	atio of second	lary resid.
	French	Res. for.	Non-res. for.	French	Res. for.	Non-res. for.	French	Res. for.	Non-res. for.
Decile 1	3.1	5.8	1.5	10.7	13.4	5.9	1.8	2.7	0.9
Decile 2	9.6	12.8	4.6	11.2	11.8	6.8	7.4	10.9	3.5
Decile 3	12.7	13.5	8.0	10.7	11.9	6.7	10.9	11.3	5.6
Decile 4	12.2	11.7	8.5	11.3	11.7	7.9	11.5	10.7	6.2
Decile 5	12.5	11.7	8.9	10.8	9.7	8.6	12.8	12.4	9.0
Decile 6	11.0	10.1	10.6	11.0	9.5	8.7	13.4	12.6	10.2
Decile 7	10.3	9.1	13.0	9.3	8.4	8.8	11.3	10.1	9.7
Decile 8	10.0	9.5	15.1	9.9	8.8	10.7	11.8	10.8	11.5
Decile 9	9.9	8.5	14.1	8.5	7.8	17.3	11.6	10.8	19.2
Decile 10	8.7	7.3	15.7	6.6	7.0	18.7	7.5	7.8	24.2
Panel B:]	Distributi	on of buye.	rs (%) across bu	iyer types <i>i</i>	and within	deciles of neighbor	hoods ranked by		
	Year	-1990 educ	cation level	Average	price/ m^2 (over 1992–1996	Year-1990 r	atio of second	lary resid.
	French	Res. for.	Non-res. for.	French	Res. for.	Non-res. for.	French	Res. for.	Non-res. for.
Decile 1	90.4	8.3	1.3	92.4	6.0	1.6	92.0	6.7	1.3
Decile 2	92.5	6.1	1.3	93.1	5.1	1.8	92.0	6.7	1.3
Decile 3	93.3	4.9	1.8	92.8	5.3	1.9	93.7	4.8	1.4
Decile 4	93.6	4.5	2.0	92.9	5.0	2.1	94.1	4.4	1.5
Decile 5	93.6	4.4	2.0	93.3	4.4	2.4	93.5	4.5	2.0
Decile 6	93.1	4.3	2.7	93.5	4.2	2.4	93.5	4.4	2.1
Decile 7	92.5	4.1	3.5	92.8	4.3	2.8	93.4	4.2	2.4
Decile 8	91.6	4.3	4.1	92.5	4.3	3.2	93.1	4.2	2.7
Decile 9	92.2	3.9	3.9	89.9	4.3	5.9	91.3	4.2	4.5
Decile 10	91.3	3.8	4.9	87.4	4.7	7.9	87.1	4.5	8.4

Table 3: Locational sorting

Table 4: Preferred habitats

This table reports the results of the OLS estimation of equation (3) using the total number of purchases by either resident foreigners or non-resident foreigners in a district (over our sample period 1992–2016) as the dependent variable. The analysis is restricted to the top-twenty buyer nationality groups shown in panel E of Table 1. *, **, and *** denote statistical significance at the 10%, 5%, and 1% level, respectively.

	(1) Res. for.	(2) Non-res. for.
Number of compatriots in 1982	0.1347 *** (0.0165)	0.0221 ** (0.0108)
District fixed effects	Yes	Yes
Nationality fixed effects	Yes	Yes
N	399	388

Table 5: Drivers of purchase decisions

Column 1 of this table reports the results of the OLS estimation of equation (4) using the log yearly change in the number of purchases by either resident foreigners or non-resident foreigners of a certain nationality. Column 2 adds year fixed effects. The analysis is restricted to the top-twenty buyer nationality groups shown in panel E of Table 1, and to cases where the lagged numer of purchases was at least equal to ten. *, **, and *** denote statistical significance at the 10%, 5%, and 1% level, respectively.

	(1)	(2)	(3)	(4)
	Res. for.	Res. for.	Non-res. for.	Non-res. for.
GDP growth	-0.0002	0.0044	0.0170 *	0.0184 *
	(0.0055)	(0.0054)	(0.0089)	(0.0098)
Equity return	0.0013 **	0.0002	0.0028 ***	-0.0011
	(0.0007)	(0.0008)	(0.0010)	(0.0016)
FX change	0.0039 ***	0.0045 ***	0.0092 ***	0.0107 ***
	(0.0013)	(0.0013)	(0.0034)	(0.0033)
Year fixed effects	No	Yes	No	Yes
N	327	327	244	244

Table 6: Annualized capital gains

Column 1 of Panel A of this table reports the results of the OLS estimation of equation (5) using the annualized log capital gain on a property's resale (winsorized at the 1^{st} and 99^{th} percentile) as the dependent variable. Column 2 until 4 add extra control variables. The analysis is restricted to property resales with holding periods of at most 40 years. Panel B uses more detailed seller group dummy variables. *, **, and *** denote statistical significance at the 10%, 5%, and 1% level, respectively.

	(1)	(2)	(3)	(4)
Seller: French	[left out]	[left out]	[left out]	[left out]
Seller: resident foreigner	0.0082 ***	0.0081 ***	0.0045 ***	0.0041 ***
Seller: non-resident foreigner	-0.0187 ***	-0.0184 *** (0.0011)	-0.0116 ***	-0.0109 ***
Buyer: French	(0.0011) [left out]	(0.0011) [left out]	(0.0021) [left out]	(0.0021) [left out]
Buyer: resident foreigner	-0.0016 ** (0.0008)	-0.0014 * (0.0008)	0.0001 (0.0011)	-0.0001 (0.0011)
Buyer: non-resident foreigner	0.0066 ***	0.0067 ***	0.0086 ***	0.0084 ***
Seller: rental property	(0.0010)	(0.0010)	(0.0014) [left out]	$\left[\text{left out} \right]$
Seller: primary residence			0.0133 ***	0.0115 ***
Seller: secondary residence			(0.0013) 0.0024 (0.0016)	(0.0013) 0.0027 (0.0017)
Seller: socio-demographic char.	No	No	No	Yes
Holding period dummy variables	Yes	Yes	Yes	Yes
Holding period x education interact.	No	Yes	Yes	Yes
Neighborhood fixed effects	Yes	Yes	Yes	Yes
N	56,112	56,006	28,924	28,569

Panel A: Baseline specifications

	(1)	(2)	(3)	(4)
Seller: French + Paris	[left out]	[left out]	[left out]	[left out]
Seller: French $+$ Ile-de-France	-0.0099 ***	-0.0097 ***	-0.0033 *	-0.0030
	(0.0010)	(0.0010)	(0.0019)	(0.0019)
Seller: French $+$ rest of France	-0.0161 ***	-0.0159 ***	-0.0115 ***	-0.0111 ***
	(0.0009)	(0.0009)	(0.0018)	(0.0018)
Seller: French $+$ abroad	-0.0175 ***	-0.0177 ***	-0.0143 ***	-0.0148 ***
	(0.0020)	(0.0020)	(0.0039)	(0.0039)
Seller: for eigner $+$ Paris	0.0043 ***	0.0043 ***	0.0030 **	0.0026 **
	(0.0010)	(0.0010)	(0.0012)	(0.0012)
Seller: for eigner $+$ Ile-de-France	0.0044 **	0.0045 **	0.0090 **	0.0075 **
	(0.0022)	(0.0022)	(0.0038)	(0.0038)
Seller: for eigner $+$ rest of France	-0.0109 ***	-0.0108 ***	-0.0058	-0.0048
	(0.0031)	(0.0031)	(0.0055)	(0.0056)
Seller: non-resident foreigner	-0.0235 ***	-0.0232 ***	-0.0155 ***	-0.0146 ***
	(0.0011)	(0.0011)	(0.0022)	(0.0022)
Buyer: French	[left out]	[left out]	[left out]	[left out]
Buyer: resident foreigner	-0.0012	-0.0010	0.0002	0.0000
	(0.0008)	(0.0008)	(0.0011)	(0.0011)
Buyer: non-resident foreigner	0.0066 ***	0.0068 ***	0.0086 ***	0.0084 ***
	(0.0010)	(0.0010)	(0.0014)	(0.0014)
Seller: rental property			[left out]	[left out]
Seller: primary residence			0.0100 ***	0.0085 ***
1 0			(0.0015)	(0.0015)
Seller: secondary residence			0.0029 *	0.0031 *
v			(0.0016)	(0.0017)
Seller: socio-demographic char.	No	No	No	Yes
Holding period dummy variables	Yes	Yes	Yes	Yes
Holding period x education level interact.	No	Yes	Yes	Yes
Neighborhood fixed effects	Yes	Yes	Yes	Yes
N	56,112	56,006	28,924	28,569

Panel B: Specifications with more detailed seller groups

Table 7: Holding periods

Column 1 of Panel A of this table reports the results of the OLS estimation of equation (6) using the holding period in years between purchase and resale as the dependent variable. Column 2 until 4 add extra control variables. Panel B uses more detailed seller group dummy variables. *, **, and *** denote statistical significance at the 10%, 5%, and 1% level, respectively.

	(1)	(2)	(3)	(4)
Seller: French	[left out]	[left out]	[left out]	[left out]
Seller: resident foreigner	1.3972 *** (0.0487)	1.3973 *** (0.0488)	0.9903 *** (0.0595)	0.7163 *** (0.0572)
Seller: non-resident foreigner	1.3200 ***	1.3228 ***	1.9698 ***	1.7093 ***
Seller: rental property	(0.0536)	(0.0537)	(0.1028) [left out]	(0.0980) [left out]
Seller: primary residence			-1.5141 ***	-0.7334 ***
Seller: secondary residence			(0.0684) -4.0699 *** (0.0807)	(0.0658) -3.9011 *** (0.0766)
Seller: socio-demographic char.	No	No	No	Yes
Purchase year fixed effects	Yes	Yes	Yes	Yes
Purchase year x education level interact.	No	Yes	Yes	Yes
Neighborhood fixed effects	Yes	Yes	Yes	Yes
N	94,133	93,973	45,475	44,154

Panel A: Baseline specifications

	(1)	(2)	(3)	(4)	
Seller: French + Paris	[left out]	[left out]	[left out]	[left out]	
College Franch - Us de Frances	0.9516 ***	0.9400 ***	0 9697 ***	0.0747	
Seller: French + Ile-de-France	$-0.3510^{-0.10}$	-0.3409	(0.0020)	-0.0747	
	(0.0510)	(0.0511)	(0.0938)	(0.0890)	
Seller: French + rest of France	$-0.1(38^{-0.17})$	-0.1055 (0.0470)	(0.0200)		
	(0.0479)	(0.0479)	(0.0899)	(0.0858)	
Seller: French + abroad		0.6663	1.1049	$1.1(10^{++++})$	
	(0.0976)	(0.0978)	(0.1797)	(0.1707)	
Seller: foreigner + Paris	1.2087	1.2086	0.9180	0.5876^{+++}	
	(0.0555)	(0.0556)	(0.0633)	(0.0608)	
Seller: foreigner + Ile-de-France	1.(524	1.(811	2.0557^{++++}	1.7084	
	(0.1250)	(0.1253)	(0.2070)	(0.1952)	
Seller: foreigner + rest of France	1.9295 ***	1.9271^{***}	2.6421 ***	2.1005^{***}	
	(0.1722)	(0.1723)	(0.2870)	(0.2703)	
Seller: non-resident foreigner	1.2625 ***	1.2685 ***	2.2407 ***	1.7970 ***	
	(0.0554)	(0.0555)	(0.1086)	(0.1036)	
Seller: rental property			[left out]	[left out]	
Seller: primary residence			-1.2220 ***	-0.6195 ***	
1 0			(0.0771)	(0.0734)	
Seller: secondary residence			-4.0617 ***	-3.8945 ***	
U U			(0.0807)	(0.0766)	
Seller: socio-demographic char.	No	No	No	Yes	
Purchase year fixed effects	Yes	Yes	Yes	Yes	
Purchase year x education interact.	No	Yes	Yes	Yes	
Neighborhood fixed effects	Yes	Yes	Yes	Yes	
N	94,133	93,973	45,475	44,154	

Panel B: Specifications with more detailed seller groups

Table 8: Conditional correlations between inflow of foreigners and prices

Column 1 of this table reports the results of the OLS estimation of equation (7) using the annualized log capital gain on a property's resale (winsorized at the 1^{st} and 99^{th} percentile) as the dependent variable. Column 2 adds extra control variables. Columns 3 and 4 repeat the analysis on the subsample of transactions where both the buyer and the seller are French. The analysis is restricted to property resales with holding periods of at most 40 years. *, **, and *** denote statistical significance at the 10%, 5%, and 1% level, respectively.

	(1)	(2)	(3)	(4)
	All	All	"French" only	"French" only
Buy volume: resident foreigners	-0.0001	0.0002	0.0003	0.0004
	(0.0005)	(0.0005)	(0.0008)	(0.0008)
Buy volume: non-resident foreigners	0.0033 ***	0.0014 **	0.0032 ***	0.0013
	(0.0005)	(0.0006)	(0.0010)	(0.0010)
Year-1990 ratio of secondary resid.		0.0379 **		0.0694 **
		(0.0190)		(0.0348)
District fixed effects	No	Yes	No	Yes
Buyer and seller group fixed effects	Yes	Yes	N.A.	N.A.
Holding period dummy variables	Yes	Yes	Yes	Yes
Holding period x education interact.	Yes	Yes	Yes	Yes
N	37,925	37,920	15,305	15,303

Table 9: Impact of inflow of foreigners on prices (2SLS)

Columns 1–3 of this table report 2SLS regression results. The second-step results reported in column 3 repeat the model specification of column 2 in Table 8 using the annualized log capital gain on a property's resale (winsorized at the 1st and 99th percentile) as the dependent variable. The first-step results reported in columns 1 and 2 instrument $Inflow_{n,s\to t}^{RF}$ and $Inflow_{n,s\to t}^{NRF}$, respectively. Columns 4–6 repeat the analysis on the subsample of transactions where both the buyer and the seller are French. The analysis is restricted to property resales with holding periods of at most 40 years. *, **, and *** denote statistical significance at the 10%, 5%, and 1% level, respectively.

	(1)	(2) All	(3)	(4)	(5) "French" only	(6)
		All			French only	
	Step 1		Step 2	St	Step 1	
	Res. for.	Non-res. for.		Res. for.	Non-res. for.	
Buy volume: resident foreigners			0.0090			0.0036
			(0.0062)			(0.0200)
Buy volume: non-resident foreigners			0.0606 ***			0.0877 ***
			(0.0062)			(0.0220)
Shift-share res. for. purchases	0.1262 ***	0.0706 ***		0.1002 ***	0.0746 ***	
	(0.0054)	(0.0046)		(0.0083)	(0.0065)	
Shift-share non-res. for. purchases	-0.0512 ***	-0.1027 ***		-0.0237	-0.0713 ***	
	(0.0130)	(0.0110)		(0.0208)	(0.0163)	
Shift-share non-res. for. purchases	-0.0984	1.8062 ***		-0.1818	0.9765 ***	
x Year-1990 ratio of secondary resid.	(0.1238)	(0.1052)		(0.2227)	(0.1741)	
Year-1990 ratio of secondary resid.	Yes	Yes	Yes	Yes	Yes	Yes
District fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Buyer and seller type fixed effects	Yes	Yes	Yes	N.A.	N.A.	N.A.
Holding period x education interact.	Yes	Yes	Yes	Yes	Yes	Yes
N	37,920	37,920	37,920	15,303	15,303	15,303