Golden Visas and Real Estate Markets*

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Abstract

This paper studies the impact of investor citizenship and residence schemes—more colloquially known as *golden visa* programmes—on local real estate markets. We do so by examining the Spanish golden visa programme that was introduced in 2013 and grants visas and authorizations with full residence rights to foreign investors who invest at least 500,000 Euro in the Spanish real estate market. Using the universe of real estate transactions in Spain and difference-in differences as well as spatial techniques, we obtain three main findings. First, the number of real estate transactions above the threshold increased by 0.24% more for non-EU relative to EU and investors after the introduction of the programme. Second, non-EU investors appear to pay a premium of 9,228 Euro around the threshold relative to non-EU and Spaniards. Finally, we find that the programme had spillover effects on the real estate market increasing overall real estate transaction prices on average by 0.45% after the introduction of the scheme.

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1 Introduction

With the onset of the global financial crisis, many countries in the world decided to introduce policies aimed at stimulating their economies and increasing investment flows. In particular, many national governments introduced investor citizenship and residence schemes, more colloquially known as "golden passport" and "golden visa" programmes, which allow individuals to buy citizenship or residence in a host country for a substantial financial contribution. The usual qualifying investments are investment in a company, in an investment fund or structure, in government bonds, in real estate, deposits in a bank, and financial contributions to the public good. Globally, more than 60 countries currently operate golden passport or visa programmes, which see hundreds of thousands of people using their purchasing power to gain a grade of membership in a polity each year. In the European Union alone, more than 130,000 people have gained citizenship or residence in this way, through programmes that are found in half of all EU member states (Surak, 2023). Despite the worldwide use of these investor citizenship and residence schemes by national governments, there is no study causally evaluating their economic impact.

This paper aims to fill this gap by causally evaluating the introduction of the golden visa programme in 2013 in Spain. According to national government reports, most applicants park their funds in real estate. Hence, the focus of this study will be to evaluate the impact of investments in real estate through the programme on local real estate markets. Spain is an ideal laboratory for two main reasons. First, the country has one of the most generous golden visa programmes in the world, as non-EU investors can obtain a visa or authorizations with full residence rights by just investing at least 500,000 Euro in real estate. Second, it also has rich administrative micro-level data on the universe of real estate transactions from real estate property registrars before and after the introduction of the programme, including the location of the properties, the nationality of buyers and sellers, as well as financing information.

We provide three main results. First, we study whether the programme was effective, that is, whether there has been a significant increase in real estate investment by non-EU investors after its introduction. We first provide descriptive evidence documenting that non-EU investors bunch at the 500,000 Euro threshold and that the growth in real estate-transactions by non-EU investors has been 3.42% higher than the growth for EU investors after the introduction of the programme. We then estimate the effectiveness of the programme more formally using difference-in-differences techniques and comparing the number of real estate transactions above the 500,000 Euro threshold by non-EU relative to EU investors across municipalities before and after the introduction of the programme. We find that the number of real estate transactions above the threshold increased by 0.24% more for non-EU relative to EU and investors after the introduction of the programme.

These transactions are concentrated in coastal areas and across the top 10 largest non-EU nationalities in terms of golden visa investments.

Second, we assess whether there are any price distortions between non-EU investors and all other investors as a consequence of the programme. We do so by relying on a difference-in-differences design where we compare real estate transaction prices of non-EU relative to EU and Spanish investors before and after the programme, controlling for as many transaction characteristics as possible (i.e., property quality, property size, type of buyer, etc.) and including number of squared meters and interacted zip-code and year fixed effects. We find that non-EU investors buy real estate properties around the threshold that are on average 9,228 Euro more expensive than those bought by EU and Spaniards after the introduction of the programme.These findings go in line with those found by Cvijanović and Spaenjers (2021), Davids (2020), G. Li (2021) and Pereira dos Santos and Strohmaier (2024) in other settings. In particular, Pereira dos Santos and Strohmaier (2024) uncover a golden visa premium where transaction prices exceed fiscal values by an average of around €38,000 at the investment threshold in Portugal. We do not find any other premium in other parts of the real estate price distribution.

Third, we study whether the golden visa programme may have had any spillover effects on real estate prices in Spain. For that, we exploit variation in the exposure to the programme across zip codes, that is, we rely on differences in the ex-ante exposure to high-end real estate transactions by non-EU investors across zip codes. Despite controlling for municipality-level characteristics and interacting the golden visa share with a post-reform dummy, the estimation by ordinary least squares (OLS) may still suffer an endogeneity bias. The reason is that golden visa investors do not randomly select the zip codes in which they invest, which makes identification challenging. In order to overcome the potential endogeneity problem, we construct a shift-share instrument following the approach commonly used in the literature, where we interact the share of golden visa transactions in year 2012 in every zip code with the average share of non-EU transactions across all zip codes excluding the zip code of interest in every year. This instrument is an adaptation of the network instrument developed by Card (2001), that has already been used in the context of housing markets by Saiz (2007), Ottaviano and Peri (2012) and Badarinza and Ramadorai (2018). We find that the programme had spillover effects on the real estate market increasing overall real estate transaction prices on average by 0.45% after the introduction of the scheme. In line with the effect on quantities, we also find that the spillover effects have been concentrated in coastal areas.

This paper contributes to the literature analyzing the determinants of real estate price fluctuations. Scholars have highlighted, among others, the importance of credit supply and credit conditions (e.g., Akin et al., 2014; Favara and Imbs, 2015, Favilukis, Ludvigson, et al., 2017, Jordà et al., 2015, Justiniano et al., 2019; Mian and Sufi, 2009, Mian and

Sufi, 2022); housing supply (e.g., Glaeser et al., 2005, Gyourko et al., 2013, Saiz, 2010); house purchase restrictions (e.g., Deng et al., 2022); agglomeration effects (e.g., Combes et al., 2019); shifts in beliefs (e.g., Adelino et al., 2016, Burnside et al., 2016 Kaplan et al., 2020, Mian and Sufi, 2022); inflation and money illusion (e.g., Brunnermeier and Julliard, 2008; seasonality (e.g., Ngai and Tenreyro, 2014); and demographic changes (e.g., Mankiw and Weil, 1989).

Our paper is closely related to the substrand of this literature emphasizing the role of foreign capital flows in explaining real estate price fluctuations. Early research primarily relied on cross-country data and panel regressions to examine the effect of foreign capital inflows on housing markets (e.g., Aizenman and Jinjarak, 2009, Sá et al., 2014, Cesa-Bianchi et al., 2015, Favilukis, Kohn, et al., 2013, Artola et al., 2021). More recent studies have used granular micro-level datasets and reduced-form techniques to study the causal link between foreign capital and house prices, as well as the underlying mechanisms. Scholars have highlighted the role of immigration and ethnic networks (e.g., Cvijanović and Spaenjers, 2021, Gonzalez and Ortega, 2013, Z. Li et al., 2024, Sá, 2015, Sanchis-Guarner, 2023); economic and political risk (e.g., Badarinza and Ramadorai, 2018, Sá, 2016); exchange rate depreciation (e.g., Davids, 2020); flight route openings (e.g., Sakong, 2021); and international tax policy (e.g., Gorback and Keys, 2020) as important drivers of foreign demand of real estate and real estate price increases.

We show that golden visa or investor by citizenship programmes can be an important force increasing foreign demand of real estate and real estate prices. The other few studies examining the economic impact of these programmes are either descriptive or qualitative in nature (e.g., Džankic, 2019, Surak and Tsuzuki, 2021, Surak, 2021, Surak, 2022; Surak, 2024, Xu et al., 2015). As mentioned earlier, Pereira dos Santos and Strohmaier (2024) uncover a golden visa premium around the minimum investment threshold in Portugal, but they do not assess the real effects of the programme. This paper is thus the first to quantify the impact of golden visa programmes on local real estate markets.

The rest of the paper is organized as follows. Section 2 describes the institutional setting of the Spanish golden visa programme, providing an overview of its key features and its evolution since its introduction in 2013. Section 3 provides details about the data sources used in this study, including information on real estate transactions and control variables used in the analysis. 4 presents descriptive evidence, illustrating trends in real estate investments by non-EU investors, the geographic distribution of golden visa transactions, and initial patterns of price changes around the 500,000 Euro threshold. Section 5 evaluates the programme's effectiveness by estimating the impact of the golden visa policy on the quantity of real estate transactions by non-EU investors, employing difference-in-differences techniques. Section 6 examines price effects, assessing the existence of a golden visa premium and spillover effects on local real estate markets using both difference-

in-differences and instrumental variable approaches. Finally, Section 7 summarizes our findings and future research.

2 Institutional Setting: The Spanish *Golden Visa* Programme

Following the outbreak of the 2008 financial crisis, Spain introduced a residency programme for foreigners with the aim of stimulating its economy. This scheme has been in force since September 28, 2013 (Law 14/2013 of September 27) and grants visas and authorizations with full residence rights—including access to the Schengen Area and other European Union countries—to foreign investors who make a significant capital investment.[1]. The minimum qualified investments are: 500,000 Euro in real estate; 1,000,000 Euro in shares of Spanish companies, or in investment or venture capital funds established in Spain, or in bank deposits in Spanish financial entities; 2,000,000 Euro in Spanish public debt securities; or business investment with high socioeconomic impact (for example, job creation, scientific innovation, etc.). In the case of investments in real estate, at least 500,000 Euro of the value must not be mortgaged and the investment can be made in multiple properties as long as the total investment amounts to at least 500,000 Euro.

There is no requirement for the investor to reside in Spain, but he must be of legal age, have no criminal record during the last five years and have public or private health insurance from an entity authorized to operate in Spain.[2] The investor obtains a visa with a duration of one year if he is outside of Spanish territory, while if the investor is legally in Spain he can directly obtain a residence authorization with a validity of three years (two years until 20th December 2022, Law 28/2022). If the investor with a visa wishes to maintain residence for more than one year, he can apply for a residence permit valid for three years at any time before the visa expires (under the condition of maintaining the investment and visiting the country at least once during the period). The authorization can be renewed indefinitely for subsequent five-year periods if the investor continues to comply with the requirements. Spouses, partners, children and ascendants of the investor can also obtain the visa. Investments can be made directly by individuals or through a corporation.

Table 1 shows that since the entry into force of the program in September 2013 until the end of 2019, a total of 3,768 visas and/or authorizations have been granted to investors in Spain, of which approximately 97% have been granted for the acquisition of real estate, 2% for the purchase of financial assets and 1% for business investment. This motivates

[1]The programme also grants visas and authorizations to entrepreneurs, highly qualified professionals, researchers and workers who move within the same company or group of companies.

[2]We will use he throughout as a convention.

why we focus on the effect of the acquisitions of real estate through the programme.

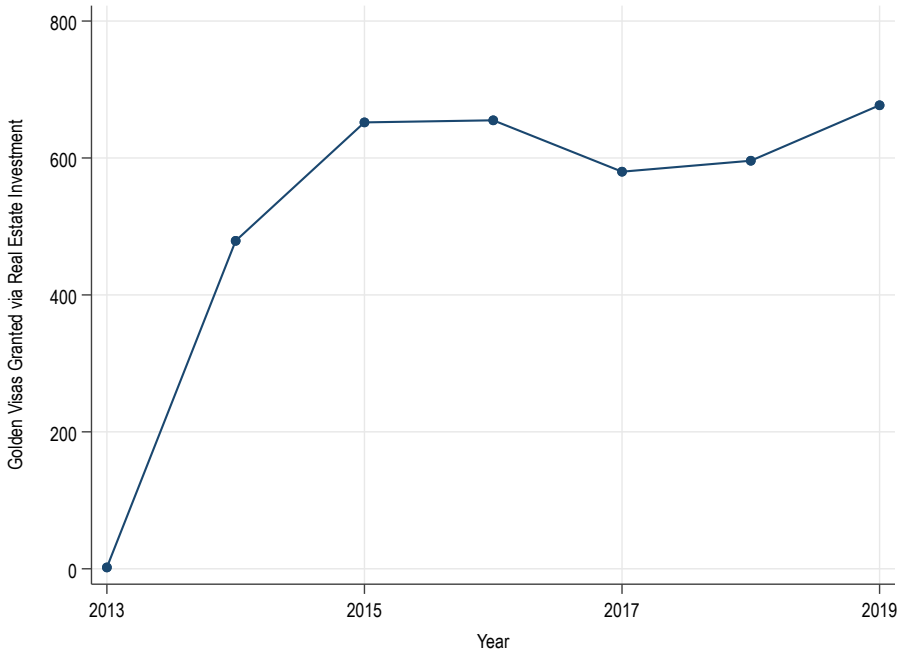
Table 1: Total investments made through the Spanish Golden Visa programme by category

Category	**Number** **(1)**	**Share (%)** **(2)**
Financial assets	88	2
Real estate	3,641	97
Businesses	39	1
Total	3,768	100

Notes: This table presents the official aggregate statistics on visas or residence authorizations granted to investors by category of the investment through the Spanish golden visa programme between September 28, 2013 and December 31, 2019. These statistics are published in Boletín Oficial de las Cortes Generales (2020).

Figure 1 documents that in 2013 the take-up of the programme was quite low—only two golden visas where granted for investments in real estate—, as the scheme was introduced late in the year and investors took some time to invest and apply for the visa. In 2014, the number of golden visas granted rose to 479. The number of golden visas further increased to 652 in 2015 and has between quite stable since then fluctuating around 600 every year.

Figure 1: Time Series of Golden Visas Granted via Real Estate Investment



Notes: This figure depicts the time series evolution of the number of golden visas granted via investments in real estate in Spain between September 28, 2013 and December 31, 2019. These statistics are published in Boletín Oficial de las Cortes Generales (2020).

The take-up of the scheme is highly concentrated among some nationalities, as shown in Table 2. The largest number of visas and/or authorizations for investment in real

estate have been granted to Chinese (1,957) and Russian (665) investors, which represent approximately three quarters of the total number of visas granted to investors. The other top nationalities in terms of number of golden visas obtained for investments in real estate are Ukrainians (80), Saudi Arabians (77), Iranians (69), Egyptians (69), US Americans (62), Emiratis (60), Venezuelans (57) and Turkish (42).

Table 2: Distribution of visas or residence authorizations granted through the Spanish Golden Visa programme for investments in real estate by nationality

	Number (1)	**Share (%) (2)**
China	1,957	54
Russia	665	18
Ukraine	80	2
Saudi Arabia	77	2
Iran	69	2
Egypt	69	2
US	62	2
UAE	60	2
Venezuela	57	2
Turkey	42	1
Rest	503	14
Total	3,641	100

Notes: This table presents the aggregate official statistics on the distribution of visas or residence authorizations granted through the Spanish golden visa programme for investments in real estate between September 28, 2013 and December 31, 2019 by nationality. The table presents disaggregated information for the top 10 nationalities in terms of the total number of visas or residence authorizations obtained over the period. Column (1) provides the total number of visas decomposed by nationality, while Column (2) shows the share they represent out of the total number of visas granted. These statistics are published in Boletín Oficial de las Cortes Generales (2020).

On April 8, 2024, the Spanish government announced that they were going to start the procedure to eliminate the golden visa programme as part of a broader move to address concerns over rising housing prices and the impact of foreign investment on local communities. Spain had already suspended its golden visa programme for Russian citizens in response to the Russian invasion of Ukraine, which began in February 2022. The suspension was part of broader sanctions and measures taken by the European Union to limit economic ties and put pressure on Russia following the conflict.

3 Data

3.1 Real Estate Transactions

The primary data source we use is the universe of real estate transaction records from the Spanish registrars, which provides very detailed information on all real estate purchases that have been officially registered across Spain from 2003 to 2022. Most real estate

transactions are registered by the registrars, as they provide legal security to the buyer for a relatively low cost.

For each transaction, the dataset includes the transaction price, transaction date, number of squared meters, property type (i.e., urban or rural, free or public) and subtype (i.e., apartment, terraced house, detached houses, commercial properties, offices, garage, land, etc.), municipality, zip code, street, property title (i.e., sale, barter, inheritance, donation), and financing information (i.e., mortgage value, interest rate, and mortgage duration). Most importantly, the dataset contains information on both buyers and sellers, in particular, their nationality as well as whether they are an individual, a corporation or a public institution.

We limit our analysis to the period from 2008 to 2019. We exclude years 2003 to 2007, since they do not contain full information on nationality, which is the key variable we need to evaluate the programme. We also exclude the period from 2020 onward to avoid the confounding effects caused by the significant decline in real estate transactions during the COVID-19 pandemic. In addition, we restrict our analysis to urban and free real estate properties, that are either apartments, terraced or detached houses, commercial properties and offices. We thus exclude rural, public or state subsidized properties, as well as any other type of property such as land, garages or industrial warehouses. We also focus on transactions arising from sales and carried by either individual or corporate buyers, thereby also excluding transactions taken place due to barters, inheritances or donations, as well as those properties bought by public institutions. We address outliers by trimming 1% from both the lower and upper tails of the value of the transaction and size of the property. This step ensures that the combination of value ad size and price per square meter falls within reasonable ranges. Finally, we also drop transactions that miss zip code and street information. As a result, our cleaned final sample comprises 3,878,873 observations, representing approximately 13% of the original raw registrars sample. Appendix A outlines the data cleaning procedure in more detail, documents the number of observations removed at each stage, and presents the annual number of observations we have in the final cleaned dataset we use in the analyses.

Despite its richness, the Spanish registrars database does not provide an indicator for whether the real estate transaction granted the buyer a golden visa or not. Hence, we need to find a proxy indicator for golden visa transactions with the available information included in the dataset. We create a golden visa dummy variable indicator and set it equal to 1 if the transaction satisfies the following two conditions: (1) the transaction value less the mortgage value is equal or above 500,000 Euro, and (2) the transaction was made by a non-EU buyer on or after September 28, 2013; 0 otherwise. This proxy may be subject to measurement error for two main reasons. On the one hand, we may be overestimating the number of golden visas with this measure if there are non-EU buyers

who are purchasing properties whose transaction value less the mortgage value is equal or above 500,000 Euro, but they do not apply for a golden visa. On the other hand, we may be underestimating this measure if there are non-EU buyers who are applying for a golden visa, but they are purchasing multiple properties below 500,000 Euro instead of just one above the threshold.

We assess the validity of our indicator at correctly identifying golden visa transactions by comparing it with the aggregate official statistics on golden visas granted for investments in real estate published in Boletín Oficial de las Cortes Generales (2020). Figure 2 reports the relationship between the official number of visas and residence authorizations granted for investments in real estate through the programme by nationality and the number of golden visa transactions by nationality based on the golden visa indicator we create using the Spanish registrars database. Note that this comparison is not perfect, as the official statistics do not only include the golden visas granted to investors, but also those granted to family members, as well as renovations of these permits. Nonetheless, the coefficient for regressing the official on our registrars measure taking logs is 0.79 and significant at the 1% level, suggesting that our indicator is quite good at capturing the overall distribution of golden visas across nationalities.

3.2 Controls

We utilize several data sources to construct our municipality-level control variables, including population and foreign population size, local property tax rate, and unemployed rates relative to the population size. We obtain population data from the Padrón Continuo microdata provided by the Instituto Nacional de Estadística (INE). This dataset offers detailed information on the number of residents by nationality for each municipality from 1996 and annually from 1998 to 2022. Municipal property tax (IBI) data for urban properties spans the period from 2000 to 2020, covering an average of 7,546 municipalities over our sample period (2008 to 2019), representing 92.8% of Spain. Monthly data on registered unemployment contracts at the municipal level in Spain, spanning the period 2005 to 2023, is sourced from Servicio Público de Empleo Estatal (SEPE). This dataset provides granular information on individuals officially registered as unemployed and actively seeking work through public employment services. To ensure data privacy and confidentiality, SEPE replaces the exact count with the notation "<5" when the number of unemployed individuals in a particular category is fewer than five. Fortunately, such cases are predominantly found in the 2022 and 2023 records, which fall outside our sample period, minimizing any potential impact on our analysis. We also incorporate various geospatial datasets: (1) Geolocation data for Spanish municipalities is obtained from Opendatasoft[3]. (2) We use data from Eurostat to identify coastal cities in Spain. These

[3]Opendatasoft database is here.

Figure 2: Relationship between Official Golden Visa Numbers and Registrars Golden Visa Transactions



Notes: This figure reports the log to log relationship between the official number of visas and residence authorizations granted for investments in real estate through the the Spanish golden visa programme by nationality and the number of golden visa transactions by nationality based on the golden visa indicator we create using the Spanish registrars database. The comparison is made for all visas granted and transactions made between September 28, 2013 and December 31, 2019. The coefficient and standard error provided are based on regressing the the official on our registrars measure taking logs. The official statistics are published in Boletín Oficial de las Cortes Generales (2020) and the transactions are obtained from the Spanish registrars.

are defined as municipalities (LAU2) that either border the coastline or have at least 50% of their surface area within 10 km of the coast[4]. (3) Historical postal codes for each municipality in Spain are sourced from the Callejero del Censo Electoral, managed by INE[5]. (4) We obtain 2023 geospatial data on zip codes in Spain from INE, enabling us to determine neighboring zip codes for each postal code.

4 Descriptive Evidence

As initial evidence, we compare the evolution of golden visa real estate transactions (i.e., those above 500,000 Euro excluding mortgages) between non-EU and EU investors. EU investors should not be responding to the golden visa programme, as they have the right to reside and move freely within the European Union, while non-EU investors should be responding to the programme, as they do not have this right. Figure 3a shows that non-EU investors experienced on average 3.42% more growth in the number of these

[4]Details are available from Eurostat here.

[5]The dataset is available in CSV format and can be accessed here.

high-end real estate transactions than EU investors between 2013 and 2019. Note that most of the growth happened post-2014, since the programme was first introduced in September 28, 2013. This differential growth in the number of transactions between non-EU and EU investors appears to be clearly driven by the programme, since the two groups of investors had a very similar evolution in the number of real estate transactions prior to the introduction of the scheme.

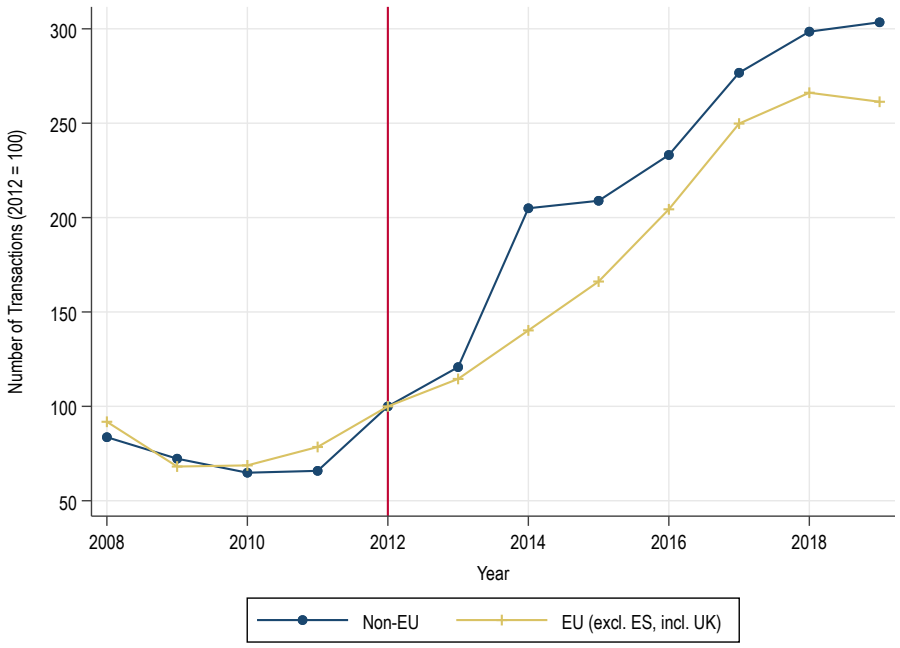
The response to the programme is heterogeneous across top non-EU investors in terms of the number of golden visas granted, with Chinese, Saudi Arabians, Egyptians and Iranians experiencing the fastest growth in transactions in the post-reform relative to the pre-reform period, as shown in Figure 3b. Note that even though Russians are the second largest nationality in terms of golden visas granted according to official statistics (see Table 2), they do not appear to experience as fast growth as other nationalities after the introduction of the scheme. The reason is that they were already buying a similar amount of high-end properties before the introduction of the programme.

Figure **??** shows that the response the programme also seems to be heterogeneous across Spanish regions. The provinces with the largest number of acquisitions of real estate by golden visa investors are Barcelona (1,162), Madrid (406), Canary Islands (88) and the Mediterranean coast, in particular, Málaga (725), Alicante (283), the Balearic Islands (186), Girona (132) and Valencia (55).

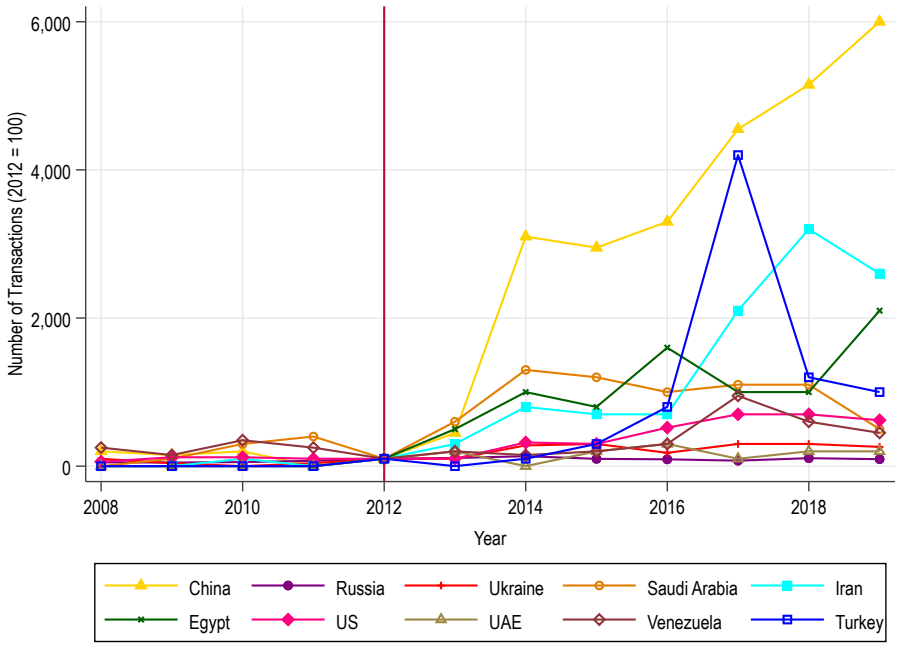
We also examine the distribution of real estate transactions before and after the introduction of the golden visa programme. Since non-EU investors can obtain a golden visa as long as they buy a property above 500,000 Euro excluding mortgages, the programme incentivizes non-EU investors to purchase properties as close as possible to, but above the 500,000 Euro threshold. Figure 4a documents that there is a rightward shift in the distribution of real estate transactions for non-EU investors in the post-reform period relative to the pre-reform period, but that this is not the case for EU investors, as shown in Figure 4b. Furthermore, 4c shows that non-EU investors buy disproportionately more properties around the 500,000 Euro threshold in the post-reform relative to the pre-reform period, but this is not the case for EU investors, as shown in Figure 4d. Hence, this evidence reveals that non-EU investors do bunch around the 500,000 Euro threshold as a response to the programme.

Figure 5 shows the distribution of real estate transactions before and after the introduction of the golden visa programme for top non-EU investors in terms of the number of golden visas granted. The rightward shift in the distribution of real estate transactions for non-EU investors in the post-reform period relative to the pre-reform period seems to be large driven by the top non-EU investors, as shown in Figure 5a. Indeed, Figure 5b shows that these top non-EU investors buy disproportionately more properties around the 500,000

Figure 3: Real estate transactions above 500,000 Euro excluding mortgages in Spain



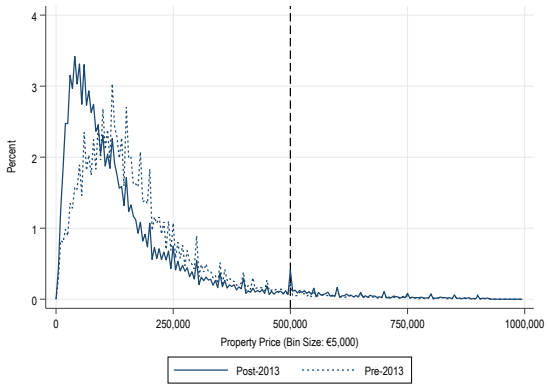
(a) Non-EU vs. EU



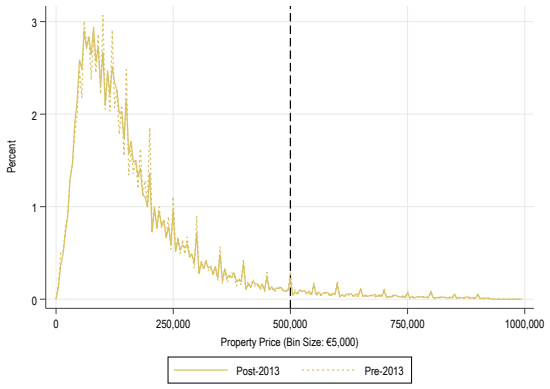
(b) Top 10 Non-EU

Notes: This figure depicts the evolution of real estate transactions above 500,000 Euro excluding mortgages over the period 2008-2019 in Spain. Panel (a) compares the evolution of transactions between non-EU and EU investors. The EU investors group excludes transactions made by Spaniards, but includes all transactions made by UK nationals (as the UK was still part of the EU during that period of time). Panel (b) shows the evolution of these high-end real estate transactions for the top 10 nationalities of non-EU investors. The top 10 nationalities are obtained based on the official counts of golden visas granted for investments in real estate over the post-reform period (28 September, 2013 up to 31 December, 2019) published in Boletín Oficial de las Cortes Generales, 2020. All series are normalized to 100 in 2012 and are based on the Spanish registrars database.

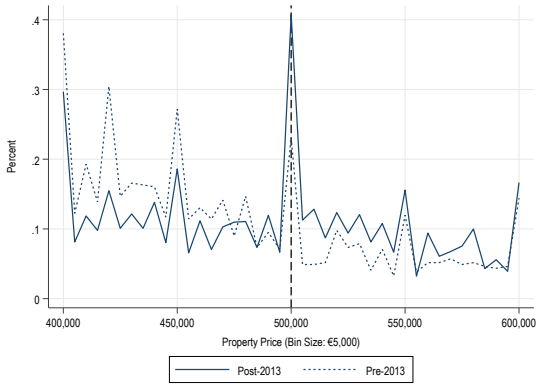
Figure 4: Distribution of real estate transactions in Spain pre- and post-reform for non-EU and EU investors



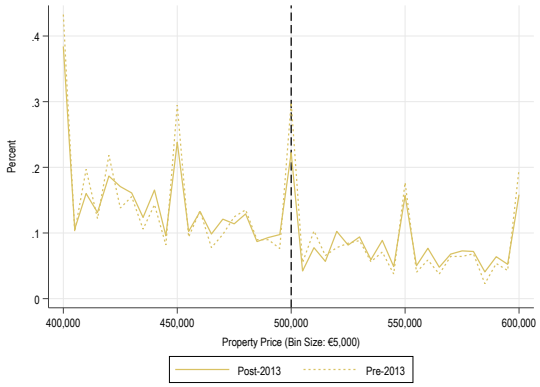
(a) Non-EU (Full distribution)



(b) EU (Full distribution)



(c) Non-EU (Zoomed-in distribution)



(d) EU (Zoomed-in distribution)

Notes: This figure depicts the distribution of real estate transactions in Spain before and after the reform for non-EU and EU investors. The EU investors group excludes transactions made by Spaniards, but includes all transactions made by UK nationals, as the UK was still part of the EU during that period of time. Panels (a) and (b) present the full distributions pre- and post-reform for non-EU and EU investors, respectively. Panels (c) and (d) present the zoomed-in distributions for real estate transactions between 400,000 and 600,000 Euro. The bin size used is 5,000 Euro.

Euro threshold. Hence, this evidence is reassuring in that the bunchers around the 500,000 Euro threshold are precisely the top golden visa investors.

5 Effects on Quantities

This section estimates the causal effect of the Spanish golden visa program on the total number of real estate transactions. To conduct the analysis, we first aggregate transaction-level data into cell-level observations defined by municipality, buyer group (non-EU vs. EU), value range (above vs. below the eligibility threshold), and year. We include all municipalities that have at least one recorded transaction (of any value) during the sample period; cells without transactions are assigned zeros. For the baseline specification, we thus consider 723 municipalities, two buyer groups, two property value ranges, and 12 years, which leads to a total of 34,704 observations. We then use our cell-level data to estimate the following triple-difference model:

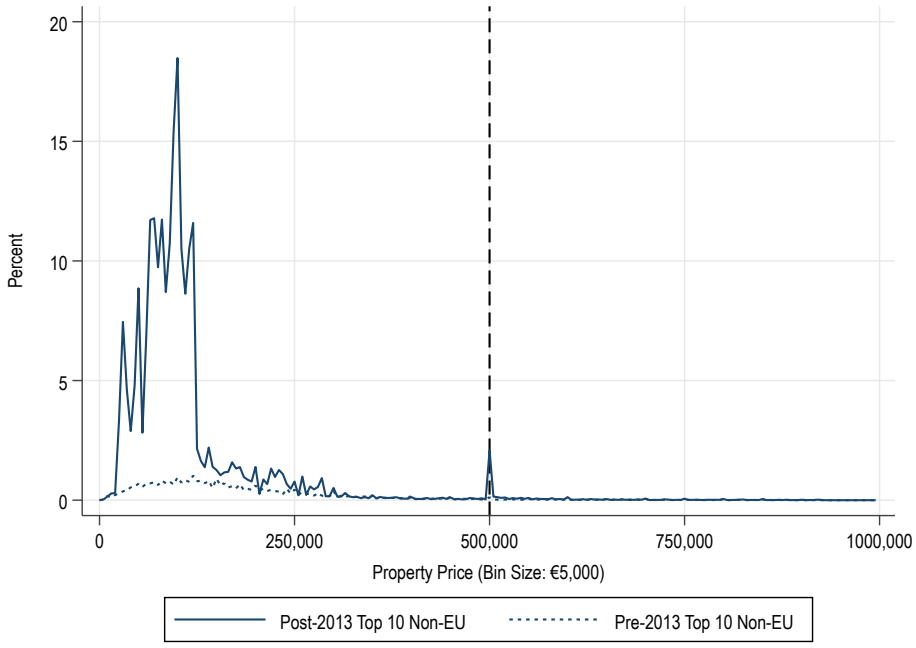
$$Q_{i,g,r,t} = \beta_0 + \sum_{t=2008}^{2019} \beta_t \times \text{Year}_{t\neq 2012} \cdot \left[BuyerGroup_g \cdot \mathbf{1}[\text{Value} \geq 500,000] \right] \quad (1)$$
$$+ \theta_t + \gamma_g + \gamma_r + \eta_{g,t} + \lambda_{g,r} + \zeta_{r,t} + \epsilon_{i,t},$$

where $Q_{i,g,r,t}$ is the number of real estate transactions in municipality i, for buyer group g, purchasing in range r, and year t. The parameters of interest are thus the annual coefficients on the triple interaction of the year dummies for the period 2008 to 2019 (with 2012 as the baseline), the non-EU buyer group indicator ($BuyerGroup_g$), which equals 1 for non-EU investors and 0 for EU investors, and $\mathbf{1}[\text{Value} \geq 500,000]$, which equals 1 for property values equal or above 500,000 Euro, 0 for properties above 350,000 Euro and below 500,000 Euro. We also include year, buyer group, and range fixed effects, as well as interactions of buyer group with year, buyer group with range, and range with year fixed effects. We restrict our analysis to municipalities with at least one transaction by one buyer group over time, as otherwise all cells would be zero and collinear with the fixed effects.

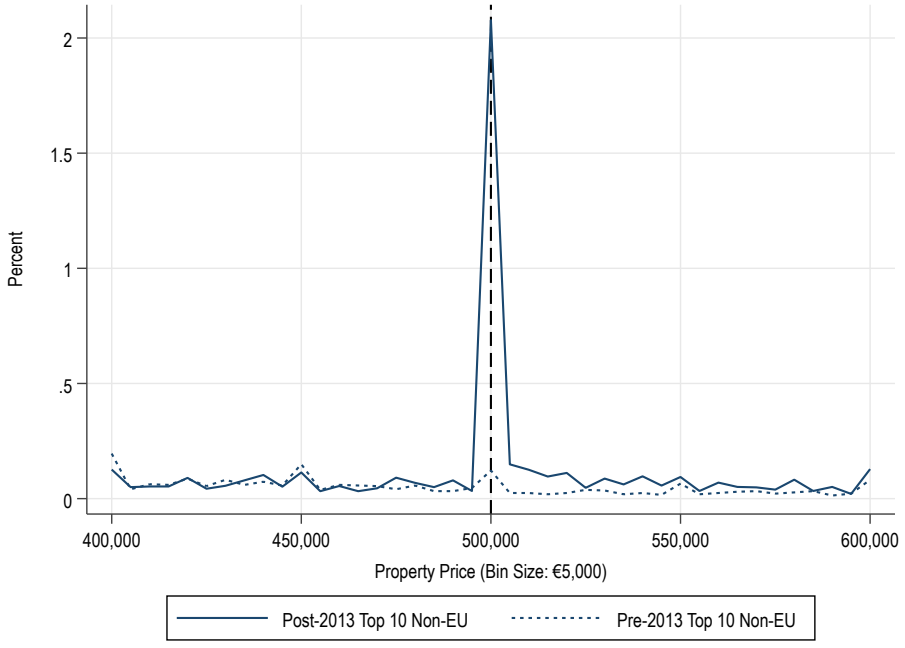
We then modify this specification to estimate range-specific effects in a cumulative way by restricting the value of transactions included in the calculation of cells and estimate aggregated post-treatment effect for the years after 2012, relative to the average of the pre-treatment period, by substituting the year dummies with a treatment-period indicator which equals 1 for 2013-2019 and 0 for 2008-2012.

Figure 6 presents the annual estimates of Equation (1). The number of golden visa transactions steadily increases relative to the comparison group (i.e., real estate transactions above 500,000 Euro made by EU investors) starting in 2013 and becomes relatively stable

Figure 5: Distribution of real estate transactions in Spain pre- and post-reform for Top 10 non-EU investors



(a) Top 10 Non-EU (Full distribution)



(b) Top 10 Non-EU (Zoomed-in distribution)

Notes: This figure depicts the distribution of real estate transactions in Spain before and after the reform for Top 10 nationalities of non-EU investors. The top 10 nationalities are obtained based on the official counts of golden visas granted for investments in real estate over the post-reform period (28 September, 2013 up to 31 December, 2019) published in Boletín Oficial de las Cortes Generales, 2020. Panel (a) presents the overall distribution of real estate transactions for top 10 non-EU nationalities before and after the introduction of the programme. Panel (b) presents the zoomed-in distribution of real estate transactions for top 10 non-EU nationalities between 400,000 and 600,000 Euro. The bin size used is 5,000 Euro.

from 2017 onwards. The average effect over the entire post-reform period (20013-2019) is 0.63 transactions, corresponding to a 0.24% increase over the 2012 baseline of 260 golden visa transactions. We find no significant differences in pre-trends, consistent with the number of real estate transactions below and above the threshold evolving similarly for EU and non-EU investors prior to the introduction of the Spanish golden visa programme. In line with the descriptive evidence shown in Sections 2 and 4, the first year of introduction of the scheme is not significant, as the programme was introduced late in 2013 and the official number of golden visas granted for investments in real estate in that year was just 2. Figure 7 shows how these estimates vary when we cumulatively adjust the upper bound of the treatment range above 500,000 Euro (Panel a) and the lower bound of the comparison range below 500,000 Euro (Panel b). When using smaller treatment ranges [500,000–650,000], the estimated average treatment effect is larger (0.91 transactions, 0.55% of the baseline) than when using broader ranges [500,000–950,000], where it is 0.63 transactions, 0.24% of the baseline. Similarly, adjusting the control range yields average effects of 2.73, 3.50, 2.86, and 1.62 transactions for control price ranges [0–500,000], [50,000–500,000], [150,000–500,000], and [250,000–500,000], respectively. These translate into proportional increases of 1.05%, 1.35%, 1.10%, and 0.62% in the baseline number of transactions within the [500,000–1,000,000] range.

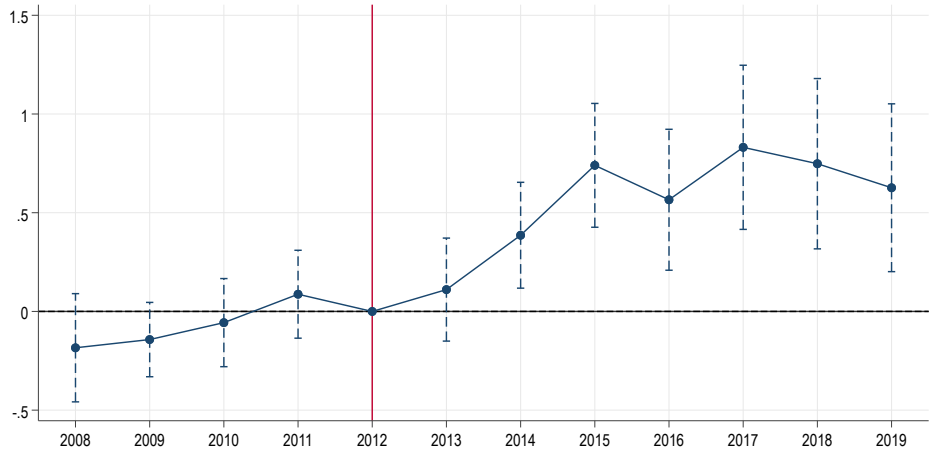
Figure 8 depicts the annual estimates by nationality. Panel (a) focuses on Chinese investors. Similar to the full sample, we observe a stable and significant post-2013 increase, with an average effect of 0.49 transactions, corresponding to a 12.25% increase relative to the 2012 baseline number of golden visa transactions made by Chinese investors. Panel (b) focuses on the top 10 non-EU investor nationalities combined. Here, the average effect is 0.61 transactions, equivalent to a 0.41% increase over the baseline number in 2012. Figure 9 splits the sample into coastal and non-coastal areas. The pattern in coastal municipalities mirrors the results of full sample, with stable and significant increase in the number of golden visa transactions after 2013. In contrast, no significant increase occurs in non-coastal areas. The average effect in coastal municipalities is 0.92 transactions, corresponding to a 0.40% increase relative to their 2012 baseline.

6 Effects on Prices

6.1 Golden visa premium

To determine whether the Spanish golden visa programme has had any impact on real estate prices, we start by assessing whether golden visa buyers paid a different price for their properties relative to other investors. For that, we use a difference-in-differences approach, comparing the evolution of real estate prices paid by non-EU against those paid by EU and Spanish investors, before and after the introduction of the Spanish golden

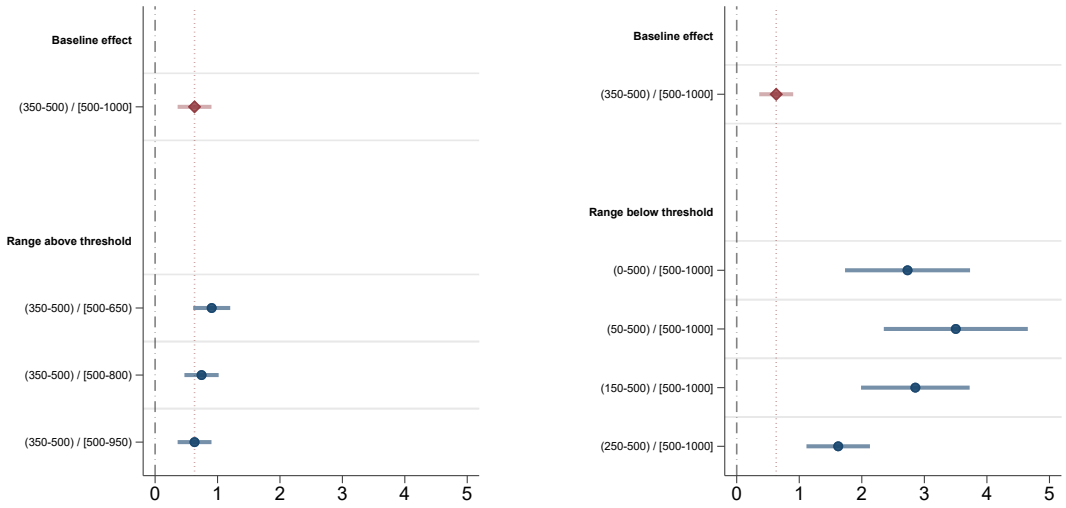
Figure 6: Triple Difference Model - Changes in Quantities above Threshold



(a) Above 500,000 Euro vs. Between 350,000 and 500,000 Euro

Notes: This figure depicts the annual estimates of Equation (1) and shows the effects based on the aggregated treatment $\mathbf{1}[Value \geq 500,000]$. *Standard errors are clustered at the municipality level and 95% confidence intervals are plotted.*

Figure 7: Triple Difference Model - Heterogeneity By Price Range

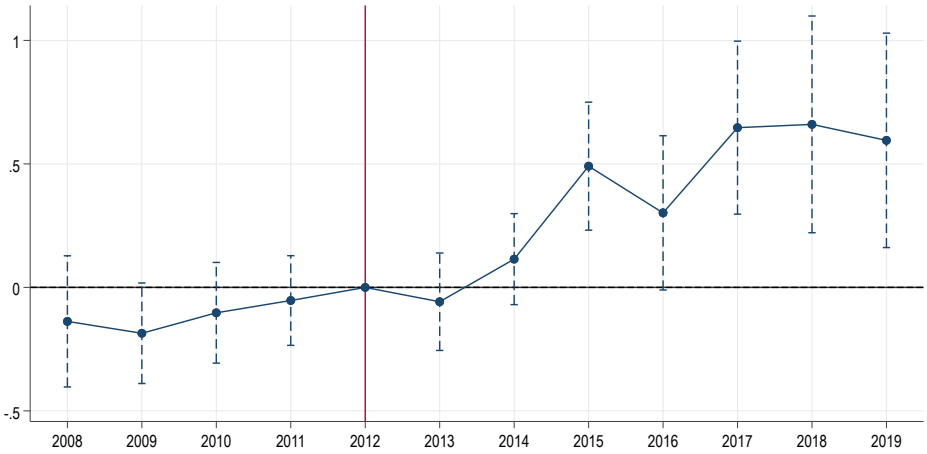


(a) Variation above Threshold

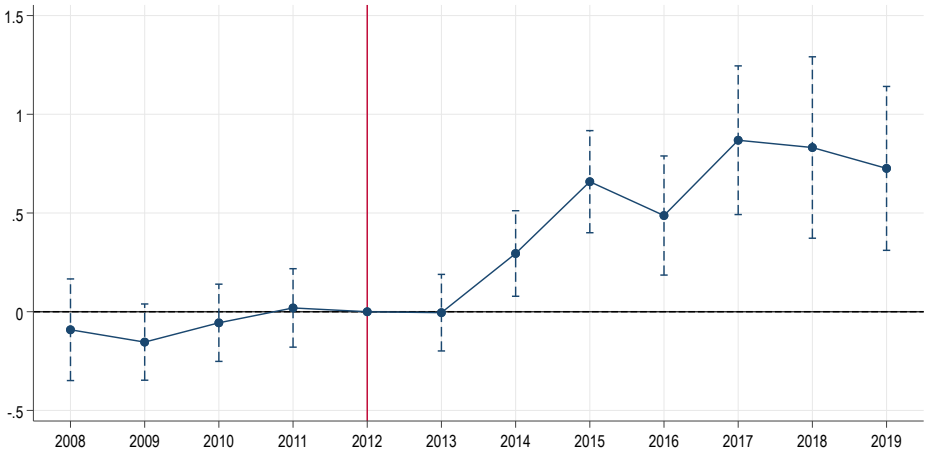
(b) Change in Control Range

Notes: This figure shows point estimates from a simplified model comparing the post-treatment to the pre-treatment period. Panel (a) varies the range of transaction values above the threshold in a cumulative way, and Panel (b) shows robustness by varying the control range below the threshold. 95% confidence bands estimated with clustered standard errors at the municipality level around point estimates.

Figure 8: Triple Difference Model - Heterogeneity by Nationality



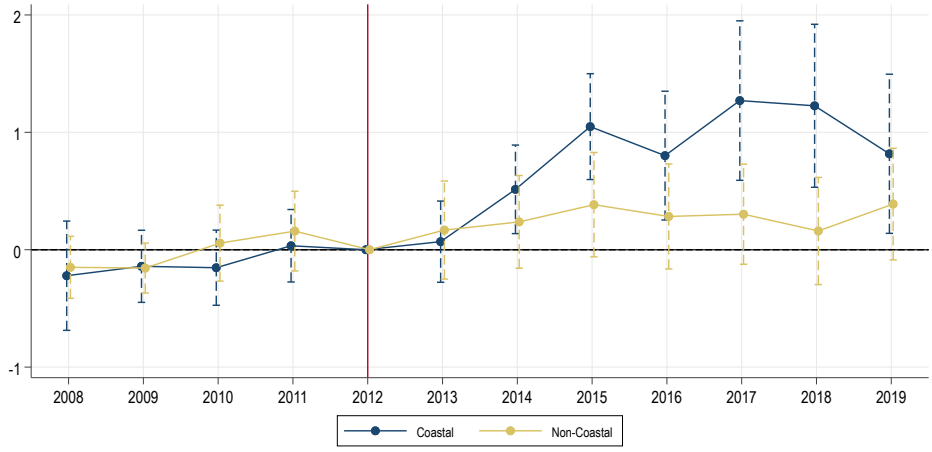
(a) Chinese



(b) Top 10 Non-EU

Notes: This figure depicts the annual estimates of Equation (1) with range-specific effects for Chinese in Panel (a) and top 10 non-EU nationalities in Panel (b). Standard errors are clustered at the municipality level and 95% confidence intervals are plotted.

Figure 9: Triple Difference Model - Coastal vs. Interior Municipalities



(a) Above 500,000 Euro vs. Between 350,000 and 500,000 Euro

Notes: This figure depicts the annual estimates of Equation (1) and shows the effects based on the aggregated treatment $\mathbf{1}[\textit{Value} \geq 500,000]$ *for coastal and non-coastal areas. Standard errors are clustered at the municipality level and 95% confidence intervals are plotted.*

visa scheme. As a robustness check, we refine the analysis by using only EU investors as control group. The regression specification we use is as follows:

$$\ln P_{i,g,z,t} = \beta_0 + \sum_{t=2008}^{2019} \beta_k \times \text{Year}_{t \neq 2012} \cdot \text{BuyerGroup}_g + X'_{i,t} \tag{2}$$
$$+ \gamma_s + \alpha_z + \mu_m + \theta_t + \zeta_{z,t} + \lambda_{m,t} + \epsilon_{i,t},$$

where $\ln P_{i,g,z,t}$ is the logarithm of the transaction price for property i, purchased by buyer group g, in zip code z, in year t. The parameters of interest are thus the annual coefficients of the interaction between $BuyerGroup_g$, which equals 1 for non-EU investors and 0 for EU and Spaniard investors (or EU investors only in the robustness check), and the year dummies for the period 2008 to 2019, using 2012 as the baseline year. We include number of squared meters s, zip code z, month m, year t, as well as interacted zip code and year and month and year fixed effects. Additionally, we control for a wide variety of transaction-level characteristics, in particular, the loan-to-value ratio associated with the property mortgage, and dummies for property subtype (i.e., apartment, terraced house, detached houses, commercial properties, offices, garage, land, etc.), property quality (i.e., new or old), buyer type (i.e., individual or corporation) and seller type (i.e., individual, corporation or public institution). We also include a dummy indicator for whether the buyer and seller are from the same country.

The analysis is conducted across three distinct price ranges – [250,000-400,000], [400,000-

550,000] and [550,000-700,000] – to capture potential heterogeneity in the program's impact across different market segments. Standard errors are clustered at the zip-code level to address potential spatial correlations in price changes, ensuring robust inference about the effects of the policy intervention.

Table 3 displays in column (1) the aggregated post-reform effect across the three three different price ranges for the years 2013-2019, relative to the average of the pre-reform 2008-2012 period using both EU and Spaniard investors as control group. To estimate that, we modify the regression in equation 2 by substituting the year dummies with a treatment-period indicator which equals 1 for 2013-2019 and 0 for 2008-2012. The results indicate a significant premium only for the 400,000-550,000 Euro price range. In particular, non-EU investors paid, on average, 2.02% ($= \exp(0.02) - 1$) more than EU and Spanish investors for properties in this range during the post-reform period relative to the pre-reform period. This translates into a premium of approximately 9,228 Euro relative on the baseline average price of 456,826 Euro paid by non-EU investors in 2012.

The existence of a golden visa premium only around the 500,000 Euro threshold is consistent with the fact that only when the property value could potentially be below the 500,000 Euro required threshold to obtain the visa, non-EU investors are willing to pay a higher price for the property. To ensure that these findings are not driven by market segmentation, columns (2-4) of Table 3 show these findings are robust to the inclusion of street and interacted street and year fixed effects. Table 4 also shows the results are robust to the use of just EU investors as control group.

Figure 10 depicts the annual estimates of Equation 2 for properties in the 400,000-550,000 Euro price range. We find no significant differences in pre-trends for the 400,000-550,000 Euro price range, indicating that non-EU and other investors paid similar prices for properties prior to the programme's introduction. The first year of introduction of the scheme is not significant for this price range either, as the programme was introduced late in 2013 and the official number of golden visas granted for investments in real estate in that year was just 2. This evidence further supports the existence of a golden visa premium just around the 500,000 Euro threshold.

6.2 Spillovers

This section studies whether the programme has had any additional effect on real estate prices beyond the golden visa premium we document in the previous subsection. For that, we rely on a two-step approach. First, we compute a price index for each year and foreign buyer group (i.e., non-EU, EU). More specifically, we run an hedonic regression model by regressing the logarithm of transaction prices $\ln P_{i,z,t}$ on different property-level attributes, as shown in Equation (3). The attributes we include in the model are: surface

Table 3: Non-EU vs EU + Spaniards

	(1)	(2)	(3)	(4)
[250,000 - 400,000]				
Non-EU	0.004*	0.002	−0.002	−0.002
	(0.002)	(0.002)		
Non-EU×Post	-0.004	−0.003	−0.002	−0.002
	(0.003)	(0.003)		
# of Observations	370,168	320,979	240,765	240,765
# of Municipalities	1,801	1,510	1,502	1,502
# of Zipcodes	2,952	2,535	2,509	2,509
R-squared	0.21	0.42	0.52	0.52
[400,000 - 550,000]				
Non-EU	0.002	−0.003	−0.001	−0.001
	(0.003)	(0.004)	(0.004)	(0.004)
Non-EU×Post	0.020***	0.025***	0.024***	0.024***
	(0.003)	(0.004)	(0.005)	(0.005)
# of Observations	94,788	76,330	55,352	55,352
# of Municipalities	871	664	661	661
# of Zipcodes	1,614	1,258	1,252	1,252
R-squared	0.18	0.37	0.47	0.47
[550,000 - 700,000]				
Non-EU	0.003	0.001	0.002	0.002
	(0.004)	(0.005)	(0.006)	(0.007)
Non-EU×Post	-0.005	−0.004	0.000	0.000
	(0.004)	(0.005)	(0.007)	(0.007)
# of Observations	33,539	25,475	17,500	17,500
# of Municipalities	486	332	330	330
# of Zipcodes	927	662	652	652
R-squared	0.19	0.38	0.47	0.47
Baseline FE	Yes	Yes	Yes	Yes
Street FE	No	Yes	No	Yes
Street×Year FE	No	No	Yes	Yes

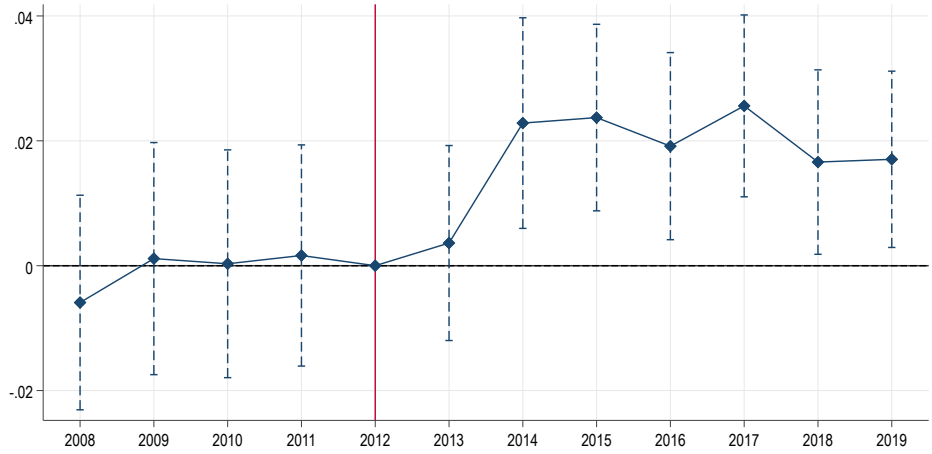
Notes: Robust standard errors in parentheses; $***p < 0.01, **p < 0.05, *p < 0.1$. *For price range [250,000-400,000], the robust standard errors in Column (3) and (4) are omitted here because of insufficient observations to do the calculation.*

Table 4: Non-EU vs EU

	(1)	(2)	(3)	(4)
[250,000 - 400,000]				
Non-EU	0.003	0.005*	−0.002	−0.002
	(0.003)	(0.003)		
Non-EU×Post	-0.009***	−0.014***	−0.009	−0.009
	(0.003)	(0.004)		
# of Observations	370,168	320,979	240,765	240,765
# of Municipalities	1,801	1,510	1,502	1,502
# of Zipcodes	2,952	2,535	2,509	2,509
R-squared	0.21	0.42	0.52	0.52
[400,000 - 550,000]				
Non-EU	-0.000	−0.002	0.002	0.002
	(0.003)	(0.004)	(0.005)	(0.005)
Non-EU×Post	0.020***	0.020***	0.016***	0.016***
	(0.004)	(0.005)	(0.006)	(0.006)
# of Observations	94,788	76,330	55,352	55,352
# of Municipalities	871	664	661	661
# of Zipcodes	1,614	1,258	1,252	1,252
R-squared	0.18	0.37	0.47	0.47
[550,000 - 700,000]				
Non-EU	0.001	−0.005	−0.005	−0.005
	(0.004)	(0.006)	(0.007)	(0.008)
Non-EU×Post	-0.004	0.003	0.009	0.009
	(0.005)	(0.006)	(0.008)	(0.009)
# of Observations	33,539	25,475	17,500	17,500
# of Municipalities	486	332	330	330
# of Zipcodes	927	662	652	652
R-squared	0.19	0.38	0.47	0.47
Baseline FE	Yes	Yes	Yes	Yes
Street FE	No	Yes	No	Yes
Street×Year FE	No	No	Yes	Yes

Notes: Robust standard errors in parentheses; $***p < 0.01, **p < 0.05, *p < 0.1$. *For price range [250,000-400,000], the robust standard errors in Column (3) and (4) are omitted here because of insufficient observations to do the calculation.*

Figure 10: Golden Visa Premium



(a) [400,000 - 550,000]

Notes: This figure depicts the annual estimates of Equation (2) for the price range 400,000-550,000 Euro. Standard errors are clustered at the zip-code level and 95% confidence intervals are plotted.

area, surface area squared, the loan-to-value ratio associated with the property mortgage, and dummies for property subtype (i.e., apartment, terraced house, detached houses, commercial properties, offices, garage, land, etc.), property quality (i.e., new or old), buyer type (i.e., individual or corporation) and seller type (i.e., individual, corporation or public institution). We also include a dummy indicator for whether the buyer and seller are from the same country, as well as year (θ_t) and zip-code fixed effects (μ_z). In addition, we also include month fixed effects to adjust for any seasonal fluctuations in prices. This allows us to construct a price index net of property characteristics by adding the constant, fixed effects for time and location, and the residual from the regression model. We then average these price indices at the zip code and year level to construct $PriceIdx_{z,t}$. We generate two versions of this index, one for the overall number of transacted properties in every zip code and year and a similar one but excluding golden visa transactions. This will help us to determine whether the programme has had any spillover effects on real estate markets beyond the localized golden visa premium around the 500,000 Euro threshold or not.

$$\ln P_{i,t,z} = \beta_0 + X'_{i,t} + \theta_t + \mu_z + \epsilon_{i,t} \tag{3}$$

Second, we rely on a difference-in-differences approach with treatment intensity where we compare the evolution of real estate prices before and after the introduction of the programme across zip codes with different exposure to the golden visa programme. In particular, we run the following specification:

$$\ln PriceIdx_{z,t} = \beta_0 + \beta_1 GVShare_{z,t} \times Post_t + X'_{z,t} + \theta_t + \mu_z + \epsilon_{z,t}, \tag{4}$$

where $PriceIdx_{z,t}$ is the real estate price index in zip code z in year t, $GVShare_{z,t}$ is the share of non-EU golden visa transactions (i.e., transactions above 500,000 Euro) in zip code z and year t, and $Post_t$ is an indicator variable which equals 1 for years between 2013 and 2019 and 0 for years 2008 to 2012. The coefficient β_1 thus measures whether there is any differential effect on real estate prices effects before and after the programme across zip codes with different exposure to the programme. We include two sets of controls in $X_{i,z,t}$. At the zip-code level, we control for the total number of non-EU transactions, the total number of EU transactions, and the logarithm of the average property surface area within the zip code. At the municipality-level, we control for property taxes on urban properties, the unemployment share relative to the total population, total population size and the foreign population size. In addition, we include year fixed effects (θ_t) to control for macro-level shocks common to all zip codes in a given year, and zip-code fixed effects (μ_z) to capture unobserved, time-invariant characteristics specific to each zip code that could influence real estate prices. Standard errors are clustered at the zip-code level to correct for spatial correlation in price trends.

The variable $GVShare_{z,t}$ may be endogenous for the following two main reasons. First, it may suffer from reverse causality, as higher real estate price growth in certain zip codes could attract more non-EU investors. Second, it may also suffer from omitted variable bias, as there may exist unobserved time-varying factors at the zip-code level, such as changes in local amenities (e.g., new schools, parks, or commercial developments), housing supply dynamics (e.g., new infrastructure projects or zoning changes), or proximity to desirable locations that could simultaneously influence real estate prices and the attractiveness of these areas for golden visa investors. To address these concerns, we construct a shift-share instrument ($SS_{z,t}$) following the approach commonly used in the literature. We create one instrument per year as follows:

$$SS_{z,t} = share_z^{2012} \times shift_{-z,t}, \tag{5}$$

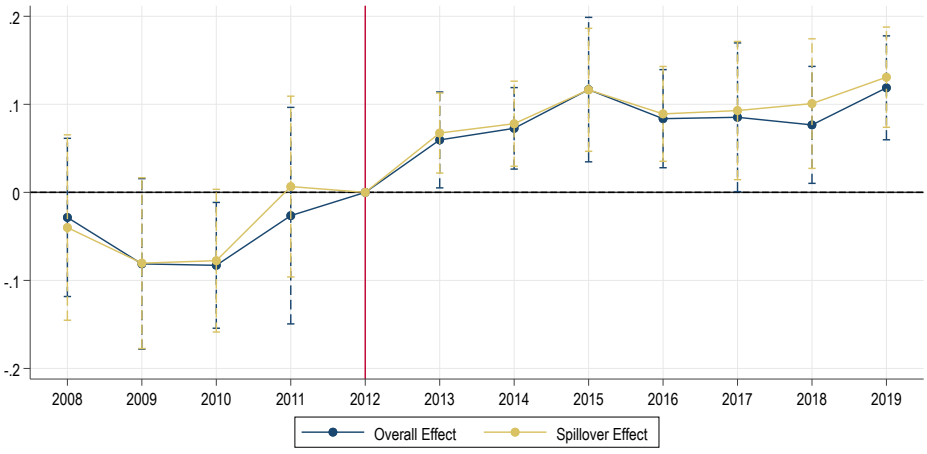
where $share_z^{2012}$ represents the share of golden visa transactions in year 2012 for a given zip code z. This captures the historical propensity of a zip code to attract non-EU golden visa transactions based on predetermined characteristics. $shift_{-z,t}$ represents the average share of non-EU transactions across all zip codes excluding zip code z for a given year t. This accounts for time-varying factors that affect the overall attractiveness of Spain to non-EU investors, but that are exogenous to any specific zip code. By combining a time-invariant local share ($share_z^{2012}$) with a time-varying aggregate shift ($shift_{-z,t}$), the instrument isolates exogenous variation in $GVShare_{z,t}$ that is uncorrelated to specific local shocks.

Table 5 summarizes the results of the difference-in-differences analysis at the zip code

level. Panel A reports estimates where the dependent variable is the price index based on all transactions, while panel B excludes transactions by golden visa investors (i.e., non-EU investors purchasing properties above 500,000 Euro). Column (1) displays the OLS results, while columns (2)-(4) present the 2SLS results using robust, municipality and zip-code-level clustered standard errors, respectively. The instrument is strong across all specifications, according to both the Cragg-Donald Wald F statistic, as well as the rk Wald F statistic.

The average golden visa share at the zip-code level in the post-reform period is 0.045%. Hence, according to our baseline estimate in column (4) panel A of Table 5, this means that the Spanish golden visa scheme led on average to an increase of 0.45% in real estate prices. This corresponds to an increase of 74 Euro relative to the average price index of 16,382 Euro in 2012. The effect is quite similar (0.49%) when looking at the average price effect excluding golden visa transactions in panel B, namely an increase of 80 Euro relative to the average price index of 16,390 Euro in 2012. Figure 11 shows that prior to the introduction of the programme there was not a different evolution in real estate prices across zip codes with different ex-ante exposure to golden visa investors. It is only after the introduction of the scheme when real estate prices start to differ across zip codes with different ex-ante exposure to to golden visa investors. The effect is quite stable throughout the entire post-reform period. This evidence indicates that the Spanish golden visa programme has had a spillover effect on the real estate market in Spain.

Figure 11: Event Study on the Average Price Effect of Golden Visa Programme



Notes: This figure depicts the annual estimates from estimating Equation (4) instrumenting the golden visa share in 2012 ($GVShare_{z,t}$) by the shift-share instrument ($SS_{z,t}$). Standard errors are clustered at the zip-code level and 95% confidence intervals are plotted.

Table 6 compares the overall average price effect of the golden visa programme in coastal and non-coastal areas. In coastal areas, the coefficient of interest is significant, while it is not in non-coastal areas. Specifically, the coefficient of 0.081 translates to a 1.17% increase in the price index in coastal areas if exposure to non-EU golden visa transactions

Table 5: Average Price Effect of Golden Visa Programme

	OLS (1)	2SLS (2)	2SLS (3)	2SLS (4)
Panel A: Overall Effect				
GVshare	0.003	0.005	0.005	0.005
	(0.002)	(0.010)	(0.013)	(0.008)
GVshare × Post	0.012***	0.100***	0.100***	0.100***
	(0.003)	(0.014)	(0.026)	(0.019)
# of Observations	79,463	79,463	79,463	79,463
# of Zipcode	9,163	9,163	9,163	9,163
Mean of Dep. Var.	9.28	9.28	9.28	9.28
Adj. R-squared	0.734	-0.051	0.070	0.070
Cragg-Donald Wald F statistic		46.80	52.90	52.90
rk Wald F statistic		4.92	100.65	14.33
Panel B: Spillover Effect				
GVshare	-0.005**	−0.010	−0.010	−0.010
	(0.002)	(0.008)	(0.010)	(0.007)
GVshare× Post	0.012**	0.108***	0.108***	0.108***
	(0.006)	(0.014)	(0.027)	(0.019)
# of Observations	79,461	79,461	79,461	79,461
# of Zipcode	9,163	9,163	9,163	9,163
Mean of Dep. Var.	9.28	9.28	9.28	9.28
Adj. R-squared	0.733	-0.040	0.080	0.080
Cragg-Donald Wald F statistic		105.14	118.85	118.85
rk Wald F statistic		4.66	108.39	13.87
Controls	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes
Zip-code FE	Yes	Yes	Yes	Yes
Cluster	Robust	Robust	Municipality	Zip-Code

Notes: This table depicts the coefficients of interest from estimating Equation (4). Panel A reports the estimates for full set of transactions, while panel B reports the same estimates excluding golden visa transactions. Column (1) presents the OLS results, while Columns (2) to (4) displays the estimates from estimating the same Equation (4), but instrumenting the golden visa share ($GVShare_{z,t}$) by the shift-share instrument ($SS_{z,t}$). Robust standard errors are reported in Columns (1) and (2) and municipality and zip-code level standard error clustering are applied in Columns (3) and (4), respectively. Standard errors are reported in parentheses; $***p < 0.01, **p < 0.05, *p < 0.1$.

rises from 0% to the post-period average of 0.14%. This corresponds to an increase of 278 Euro, from the 2012 average price index of 23,735 Euro. The spillover effects on real estate prices of the golden visa programme have thus been concentrated in coastal areas.

7 Conclusion

This paper provides the first causal analysis of the economic effects of the golden visa programme on local real estate markets in Spain. Using rich administrative micro-level data on the universe of real estate transactions before and after the introduction of the Spanish golden visa scheme in 2013, we show that the program effectively stimulated foreign real estate investment by non-EU investors. Our results indicate a significant increase in the volume of high-value real estate purchases by non-EU investors, with a stable and sizeable effect emerging a few years after the introduction of the programme. Moreover, these effects are stronger in coastal areas, which appear especially attractive to foreign real estate buyers.

We also find evidence of a "golden visa premium" around the 500,000 Euro investment threshold. Specifically, non-EU investors consistently pay higher prices for properties just above this threshold, relative to EU and Spanish investors, after controlling for property characteristics and location-specific factors. This premium likely reflects the willingness of non-EU buyers to outbid local purchasers in order to secure the residency benefits tied to qualifying real estate investments.

Beyond demonstrating the effectiveness of the Spanish golden visa program in boosting foreign real estate demand, we examine potential spillover effects on broader housing market outcomes. Our instrument variable strategy, leveraging non-EU investors' historical purchasing patterns of high value properties, suggests that rising foreign investment translates into moderate increases in local real estate prices – even when golden visa transactions are excluded. These spillover effects, however, are geographically concentrated and most pronounced in coastal municipalities.

From a policy perspective, these findings underscore the potential of investor visa schemes to attract foreign capital and stimulate real estate markets, particularly during economic downturns. However, the extent to which these programmes generate broader economic benefits, such as employment growth or rental market expansions, remains an open question. Our next step is to explore these dimensions to provide a more comprehensive assessment of the economic implications of golden visa programmes.

Table 6: Average Price Effect of Golden Visa Programme

	OLS (1)	2SLS (2)	2SLS (3)	2SLS (4)
Panel A: Coastal Areas				
GVshare	0.000	−0.000	−0.000	−0.000
	(0.003)	(0.011)	(0.015)	(0.010)
GVshare × Post	0.013***	0.081***	0.081***	0.081***
	(0.004)	(0.013)	(0.015)	(0.015)
# of Observations	18,215	18,215	18,215	18,215
# of Zipcode	1,781	1,781	1,781	1,781
Mean of Dep. Var.	9.84	9.84	9.84	9.84
Adj. R-squared	0.691	0.018	0.114	0.114
Cragg-Donald Wald F statistic		19.97	22.14	22.14
rk Wald F statistic		4.47	140.31	17.24
Panel B: Non-Coastal Areas				
GVshare	0.006**	0.011	0.011	0.011
	(0.003)	(0.011)	(0.010)	(0.009)
GVshare × Post	0.008*	0.243	0.243	0.243
	(0.005)	(0.364)	(0.524)	(0.368)
# of Observations	61,248	61,248	61,248	61,248
# of Zipcode	7,382	7,382	7,382	7,382
Mean of Dep. Var.	9.11	9.11	9.11	9.11
Adj. R-squared	0.687	-0.114	0.021	0.021
Cragg-Donald Wald F statistic		0.04	0.05	0.05
rk Wald F statistic		0.95	1.89	0.70
Controls	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes
Zip-code FE	Yes	Yes	Yes	Yes
Cluster	Robust	Robust	Municipality	Zip-Code

Notes: This table depicts the coefficients of interest from estimating Equation (4). Panel A reports the estimates for coastal areas, while Panel B reports the same estimates for non-coastal areas. Column (1) presents the OLS results, while Columns (2) to (4) displays the estimates from estimating the same Equation (4), but instrumenting the golden visa share ($GVShare_{z,t}$) by the shift-share instrument ($SS_{z,t}$). Robust standard errors are reported in columns (1) and (2) and municipality and zip-code level standard error clustering are applied in Columns (3) and (4), respectively. Standard errors are reported in parentheses; $***p < 0.01, **p < 0.05, *p < 0.1$.

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Appendix

A Data cleaning procedure of the Spanish Registrars database

This section provides a detailed description of the data cleaning procedure we follow to arrive to the final sample of the Spanish Registrars database we use in the analyses. This database contains the universe of all real estate transactions that have been officially registered in Spain from 2003 until 2022. Most real estate transactions are registered by the Registrars, as they provide legal security to the buyer for a relatively low cost.

Our data cleaning procedure consists of the following steps:

1. We exclude real estate transactions that have missing data for the property's surface area, transaction value, or contain nonsensical transaction dates.

2. We restrict our analysis to six types of urban real estate properties[6]: specifically, apartments with or without annexes, terraced houses, detached houses, commercial properties, and offices. We exclude public and state subsidized housing, keeping only properties sold at market prices without government-imposed price controls or subsidies. Additionally, we focus solely on transactions made by individual or corporate buyers, thereby excluding properties bought by various types of legal entities such as the national government, regional governments, provincial administrative bodies, island councils, associations of municipalities, municipal governments, and smaller local administrative units within municipalities. We also keep transactions involving purchase and sale agreements between parties, excluding those arising from barters, inheritances, or donations. We remove duplicate transactions—those recorded multiple times with the same location, price, house type, etc.—and retain only unique transactions in our sample. Since buyer nationality is crucial to our analysis, we retain only transactions where this information is available.

3. We exclude transactions containing inaccurate information regarding the municipality location.

[6]Our dataset comprises properties classified into three main categories: (1) rural properties, which include dryland farming (agricultural land reliant on rainfall), irrigated land (agricultural land with artificial irrigation systems), rural housing (residential properties located in rural areas), rural agricultural buildings (structures used for agricultural purposes in rural areas), properties dedicated to agricultural production activities, and miscellaneous rural properties not classified above; (2) urban properties, which include apartments with additional spaces such as storage rooms or parking spaces, standalone apartments without additional attached spaces, terraced houses that share common walls with neighboring properties, detached houses, commercial properties used for activities like shops or restaurants, garages, offices, storage rooms, unbuilt land, industrial warehouses, other buildings, and urban development rights; and (3) other natures, including rights granted by government entities to use public property, buildings constructed for residential purposes, and properties that do not fit into the rural or urban categories.

4. We address outliers by trimming 1% from both the lower and upper tails of the following two main variables: value of the transaction and size of the property. This step ensures that the combination of value, size and price per square meter falls within reasonable ranges.

5. We also clean the zip code variable, as our empirical analysis in Section 6 requires zip code-level fixed effects. This was achieved through a multi-step process:

    - First, we remove transactions that either lack a meaningful street name or have missing zip codes.
    - Second, using a dataset that links municipalities to zip codes, we retain transactions with accurate municipality-zip code pairs and correct those in small municipalities with only one zip code.
    - Third, we web-scraped information on street names and corresponding zip codes for every municipality and province in Spain from a website[7]. We used this dataset to correct transactions with incorrect zip codes, provided the municipality and street name perfectly matched the scraped data.
    - Fourth, for the remaining transactions, we applied fuzzy matching on street names against the web-scraped data to correct invalid zip codes. We retained matches with a similarity score higher than 0.7[8] and, for cases with multiple matches, selected the one with the highest score for each municipality-street name combination.
    - Finally, using transactions with verified municipality-street name-zip code combinations, we corrected the zip codes for the remaining transactions by matching them based on municipality and street names.

6. Finally, to study the spillover effects of the programme, we calculate the number of Golden Visa transactions for all neighboring zip codes of each zip code. Using both the geospatial file for zip codes in Spain and the zip code-municipality matching data, we achieve this task. It is important to note that zip code and municipality boundaries do not always align perfectly. A single zip code may span multiple municipalities, meaning its geographic coverage can cross municipal boundaries.

[7] https://codigo-postal.info/

[8] When selecting the threshold for the similarity score, there is always a trade-off. A higher threshold results in fewer matched observations but a lower false positive rate, while a lower threshold increases the number of matched observations at the cost of a higher false positive rate. In Table A3, we report the number of fuzzy-matched pairs between street names from the Registrars dataset and the web-scraped dataset, using thresholds ranging from 0.5 to 0.9. From these fuzzy-matched pairs, we randomly retain 1% of the sample for manual validation to assess the false positive rate, with the results documented accordingly. To strike a balance between maximizing matched pairs and minimizing the false positive rate, we select a similarity score threshold of 0.7

First, we determine the relationship between zip codes and municipalities, checking whether a zip code is strictly contained within a municipality. If not, we calculate the intersection area between a zip code and a municipality. This process is applied to the zip code-municipality geo-matched dataset to verify which pairs are correctly or incorrectly matched. For zip codes with missing municipality information after the initial matching step, we perform a spatial join to attach the nearest municipality to each zip code. For those remaining zip codes that do not have a correct municipality pair, we determine their nearest municipality using calculated spatial distance. Once the zip code-municipality pairs are established, we can then identify all neighboring zip codes for each pair.

7. We limit our analysis to the period from 2008 to 2019. We exclude years 2003 to 2007, since they do not contain full information on nationality, which is the key variable we need to evaluate the programme. We also exclude the period from 2020 onward to avoid the confounding effects caused by the significant decline in real estate transactions during the COVID-19 pandemic.

As a result, our cleaned final sample, consisting of transactions with correct zip codes, comprises 3,878,873 observations, representing 13.17% of the original raw Registrars sample. Table A1 summarizes the data cleaning process. Table A2 describes the final number of observations we use every single year, the total number of municipalities covered, as well as the overall population share they represent.

Table A1: Registrars data cleaning procedure

Steps	**Observations**	**Share**
Raw data	29,448,422	100.00%
Keep properties with non-missing transaction values	29,420,357	99.90%
Keep properties with positive surface area	28,541,171	96.92%
Keep properties with valid transaction dates	27,713,578	94.11%
Keep urban housing properties	14,572,968	49.49%
Keep free housing transactions	11,944,125	40.56%
Keep transactions involving individuals or corporate buyers	11,928,027	40.50%
Keep purchase and sale transactions	9,228,489	31.34%
Keep unique transactions	8,963,141	30.44%
Keep transactions with known buyer nationality	6,537,356	22.20%
Keep transactions with accurate municipality information	6,536,726	22.20%
Trim property values at the 1st and 99th percentiles	6,406,125	21.75%
Trim property sizes at the 1st and 99th percentiles	6,278,019	21.32%
Keep transactions with nonzero zip codes and non-missing street names	6,233,068	21.17%
Keep transactions with corrected zip codes	6,160,184	20.92%
Keep transactions from the years 2008 to 2019	3,878,873	13.17%
Final data	3,878,873	13.17%

Notes: This table outlines the different steps taken to clean the Spanish Registrars database, detailing the number of remaining observations at each stage and the corresponding percentage of the initial raw sample retained.

Table A2: Annual Real Estate Transactions

Year	**Total**	**Municipality Covered**	**Population Share**
2008	389,035	5,610	98.49%
2009	317,965	5,312	98.28%
2010	348,394	5,453	98.46%
2011	238,495	5,173	98.04%
2012	259,855	5,028	97.97%
2013	214,900	4,898	97.76%
2014	261,692	5,153	98.14%
2015	288,122	5,231	98.32%
2016	331,197	5,396	98.47%
2017	394,172	5,570	98.67%
2018	433,496	5,693	98.83%
2019	401,550	5,639	98.82%
Total	3,878,873		

Notes: This table presents the total number of annual real estate transactions (column 1) and the corresponding number of municipalities covered each year in the dataset (column 2). Column 3 reports the percentage of the population covered for each year.

Table A3: Regitrars street name fuzzy matching threshold comparison

Similarity Score Threshold	**Observations**	**1% Random Sample**	**False Positive Rate (%)**
0.5	35,591	356	27.0
0.6	27,927	279	16.8
0.7	19,888	199	9.5
0.8	11,660	117	4.3
0.9	3,820	38	0

Table A4: Summary Statistics, 2012

Variables	N	Mean	Std.Dev	Min	Max
Panel A: Transaction-level characteristics					
Whole Sample:					
Value	259,855	139,865	106,913	6,800	925,000
Surface	259,855	98	50	29	363
Price per sqm	259,855	1,519	994	19	20,087
Loan-to-value(%)	259,855	23	38	0	150
Non-EU Countries:					
Value	9,550	150,706	128,131	6,808	910,000
Surface	9,550	95	50	30	362
Price per sqm	9,550	1,590	1,051	40	11,401
Loan-to-value(%)	9,550	25	38	0	150
EU Countries:					
Value	18,027	162,037	131,103	7,200	925,000
Surface	18,027	97	54	29	362
Price per sqm	18,027	1,708	1,039	57	16,051
Loan-to-value(%)	18,027	10	27	0	150
Spain:					
Value	232,278	137,698	103,590	6,800	925,000
Surface	232,278	98	50	29	363
Price per sqm	232,278	1,502	987	19	20,087
Loan-to-value(%)	232,278	24	39	0	150
Panel B: Municipality-level characteristics					
Whole Sample:					
Number of Municipalities	5,028				
Population Covered(%)	5,028	98	0	98	98
Income pca	2,810	6,276	2,401	1,155	23,608
Property tax rate(%)	4,667	61	16	10	123
Non-EU Countries:					
Number of Municipalities	811				
Population Covered(%)	811	68	0	68	68
Income pca	709	7,138	2,608	1,734	23,608
Property tax rate(%)	766	67	19	29	123
EU Countries:					
Number of Municipalities	922				
Population Covered(%)	922	68	0	68	68
Income pca	805	6,936	2,670	1,973	23,608
Property tax rate(%)	878	66	18	29	123
Spain:					
Number of Municipalities	4,990				
Population Covered(%)	4,990	98	0	98	98
Income pca	2,798	6,285	2,398	1,155	23,608
Property tax rate(%)	4,631	61	16	10	123

Figure A1: Urban Real Estate Transactions Using Own Capital (Price $\geq$ 500,000 Euro, Excluding Mortgage) By Spaniards, 2008-2019 (Normalized to 2012)

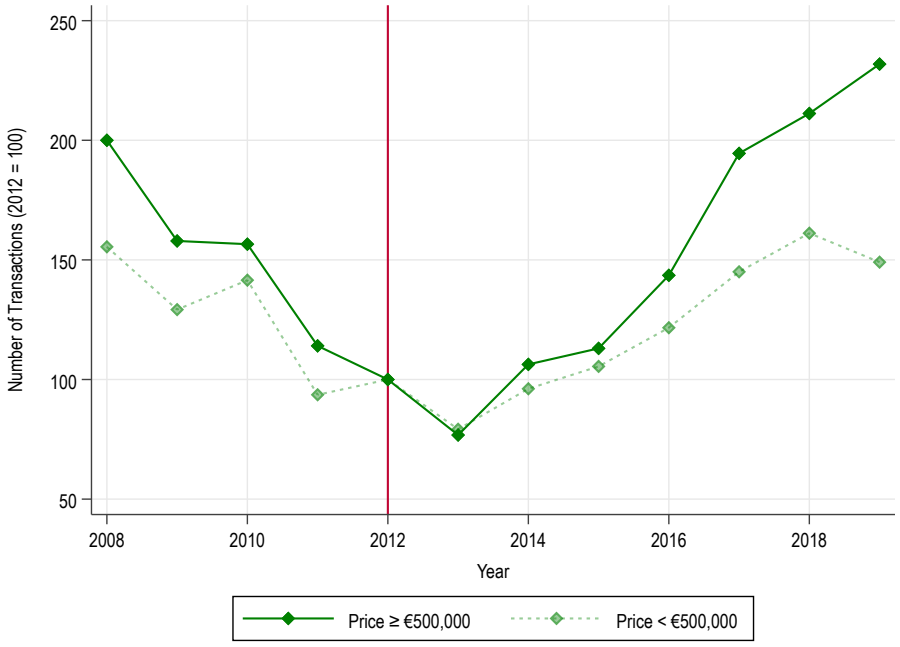


Figure A2: Comparison of Individual Urban Property Price Distributions for Spain Before and After 2013 (Bin Size: 5,000 Euro)

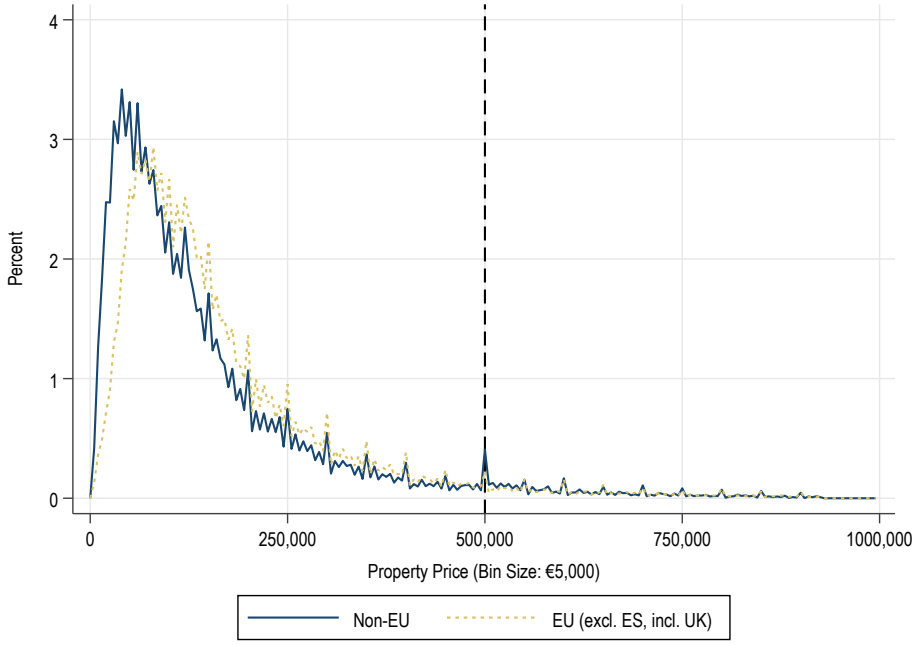


(a) Spain (Full distribution)

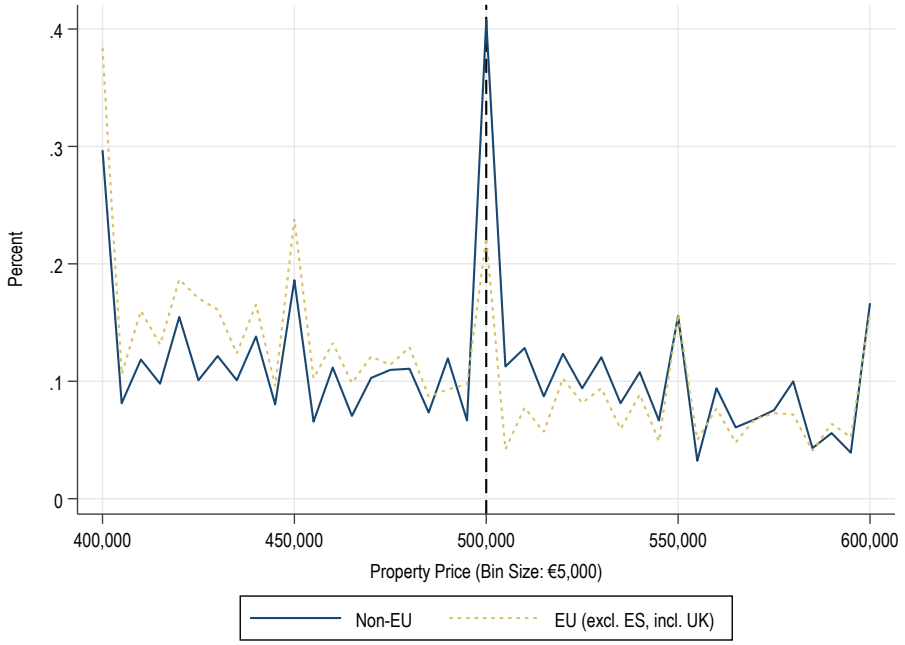


(b) Spain (Zoomed-in distribution)

Figure A3: Post-2013 Price Distributions of Individual Urban Properties: A Comparison Between EU and Non-EU Countries



(a) Non-EU vs EU (Full distribution)



(b) Non-EU vs EU (Zoomed-in distribution)