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European Real Estate Index (EREI) 2025

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Abstract

This Technical Report documents the construction and coverage of the IWH European Real Estate Index (EREI). Since 2018, we have used machine-learning methods to collect monthly listings of residential real estate available for sale or rent in up to 20 European countries. The Technical Report documents the cleaning and selection process and describes the data regarding coverage, moments, and frequencies to construct the EREI.

Keywords: European Real Estate Index, EREI, house prices

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1 Introduction

Housing markets connect the real economy to financial markets in many important ways. From the borrowers' perspective, real estate assets collateralise crucial financial products, namely mortgage loans. Since mortgage lending represents approximately 40% of total lending in the Eurozone, real estate markets are also important for the transmission of monetary policy (*Aoki et al.*, 2004; *Del Negro* and *Otrok*, 2005; *Vansteenkiste* and *Hiebert*, 2011). From the perspective of savers and investors, residential property is the primary store of household wealth and constitutes the underlying for asset-backed securities (*Campbell* and *Cocco*, 2007; *Piketty* and *Zucman*, 2014; *Berger et al.*, 2017). Historically, imbalances and sudden corrections in real estate markets ignited many financial crises in the last decades, most notably the Global Financial Crisis of 2007/2008 (*Mian et al.*, 2013). Thus, real estate markets are crucial for financial stability in modern market economies. However, whereas central banks and statistical offices provide some national, often survey-based indicators of real estate prices, a comprehensive collection of purchase prices, rents, and liquidity proxies of European real estate markets is lacking.

The IWH European Real Estate Index (EREI) seeks to fill this void for residential property. Our data collection effort aims to enhance our comprehension of how these important asset markets function in the European Union. We intend to provide a comprehensive sample of granular geographical data on asking prices for residential real estate and the liquidity of local housing markets and make it available to researchers, policymakers, and the interested public frequently.

Since 2018, we have used automated data collection techniques to gather information on European real estate markets from publicly available sources. In addition, we source data from partners, such as the RWI Essen. The data is generally updated monthly and covers residential real estate offerings in the purchase and rental markets. All data are harmonised to the Nomenclature of Territorial Units for Statistics level-3 (NUTS3) regions to facilitate cross-country comparability and spatial analyses. The resulting data allows, for the first time, a comprehensive analysis of prices, rents, and liquidity across European real estate markets.

The resulting indices exhibit vast heterogeneity of real estate market developments over time across and within countries. They give rise to important disparities in how real estate markets responded to real economic and policy shocks, such as rental caps, the staggered spread of the COVID-19 pandemic, or the war in Ukraine. By making these data available to the public, we want to enable the scientific and policymaking community to conduct an ongoing and up-to-date assessment of European real estate markets.

This technical report describes the gathering and processing of sale and rental prices for properties in the following European countries: Austria (AUT), Belgium (BEL), Croatia (HRV), Cyprus (CYP), Estonia (EST), Finland (FIN), France (FRA), Germany (DEU), Greece (GRC), Ireland (IRL), Italy (ITA), Lithuania (LTU), Luxembourg (LUX), the Netherlands (NLD), Norway (NOR), Poland (POL), Portugal (PRT), Spain (ESP), Sweden (SWE), Switzerland (CHE), and the United Kingdom (GBR). Next, we detail the data sourcing and cleaning process before describing the data available at the NUTS3 level via the Research Data Centre of the IWH.

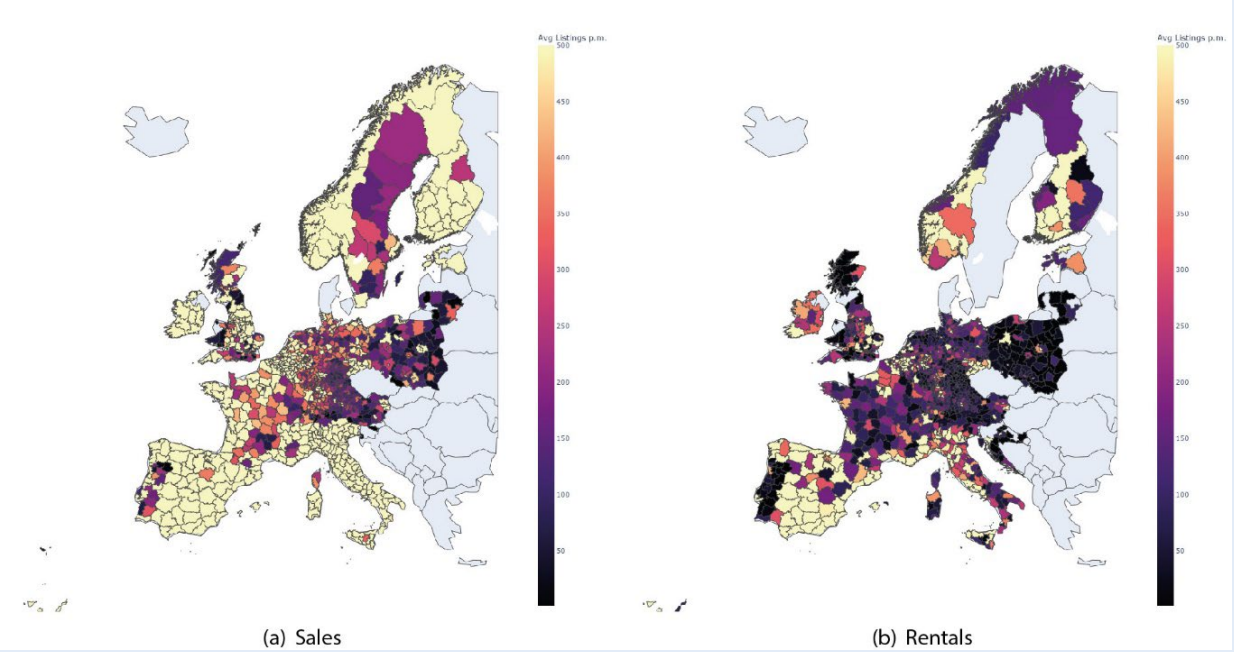
2 Data Sourcing and Processing

Real estate markets are inherently local, oftentimes opaque, and access to property-level information varies greatly across, but even within, European countries. To construct a comprehensive and consistent dataset, we rely on multiple strategies. First, we collect information regularly from

various publicly available real estate portals and platforms, which may differ by country regarding coverage and market segment focus. Second, we incorporate data from specialised data vendors and collaborating research institutions. For instance, we integrate the RWI Essen's data set on German real estate listings, which provides high-quality, well-documented time-series data back to 2007.[1] This combination of multiple sources ensures that our database captures a broad range of property types, including sales and rentals, as well as different dwelling categories, such as houses and flats.

Figure 1 illustrates the regional coverage of the data by showing the average number of monthly observations per NUTS3 region. Naturally, data availability varies substantially across countries. Ensuring the comparability of data requires us to focus on a limited number of universally observable dwelling traits, which are laid out in the Table.

Figure 1
Regional coverage (average number of listings per NUTS3)



Notes: Average number of monthly observations within each NUTS3 region in the dataset. Please note that NUTS3 regions vary in size, especially across European countries. In order to improve visualisation, data in this figure is truncated at 500 observations per NUTS3 region.

The entire sourcing and cleaning process is automated using Python scripts to ensure consistent data quality. Once raw data are retrieved monthly, we subject them to a series of quality and consistency checks. Central to this automation is a data protocol that all raw input must adhere to before being incorporated into our repository. The protocol and key requirements are summarised in the Table. Each incoming dataset is subjected to multiple validation steps:

1. Check data types: All fields must align with the expected data types (see Table: Data Type).
2. Flag or remove observations with missing key data items: Listings that fail to meet essential quality criteria are removed from the dataset (see Table: Not Null).
3. Compare number of listings across months: We track the number of valid listings per month to identify sudden drops or spikes that may indicate interruptions in data sourcing or changes in platform structure.

[1] For a detailed description see *Schaffner* (2020) and https://doi.org/10.7807/immo:redx:v3.

4. Identify regional identifiers: Each listing must have sufficient location information (e.g., city, postal code, latitude/longitude) for accurate NUTS3 matching. We employ geocoding services to infer the correct NUTS3 identifier when partial geographic information is missing.
5. Add NUTS3 information: Using official EU designations and matching tables, we map each listing to its corresponding NUTS3 region. This step standardises the spatial dimension of our data, allowing for meaningful regional comparisons.
6. Aggregate data to NUTS3 level: After filtering and cleaning, we aggregate the data at the NUTS3 level. This yields monthly panels of counts (number of listings), average and median prices (for sales and rentals), and other aggregated indicators. These aggregated data points form the basis of the European Real Estate Index (EREI) family of economic indicators.

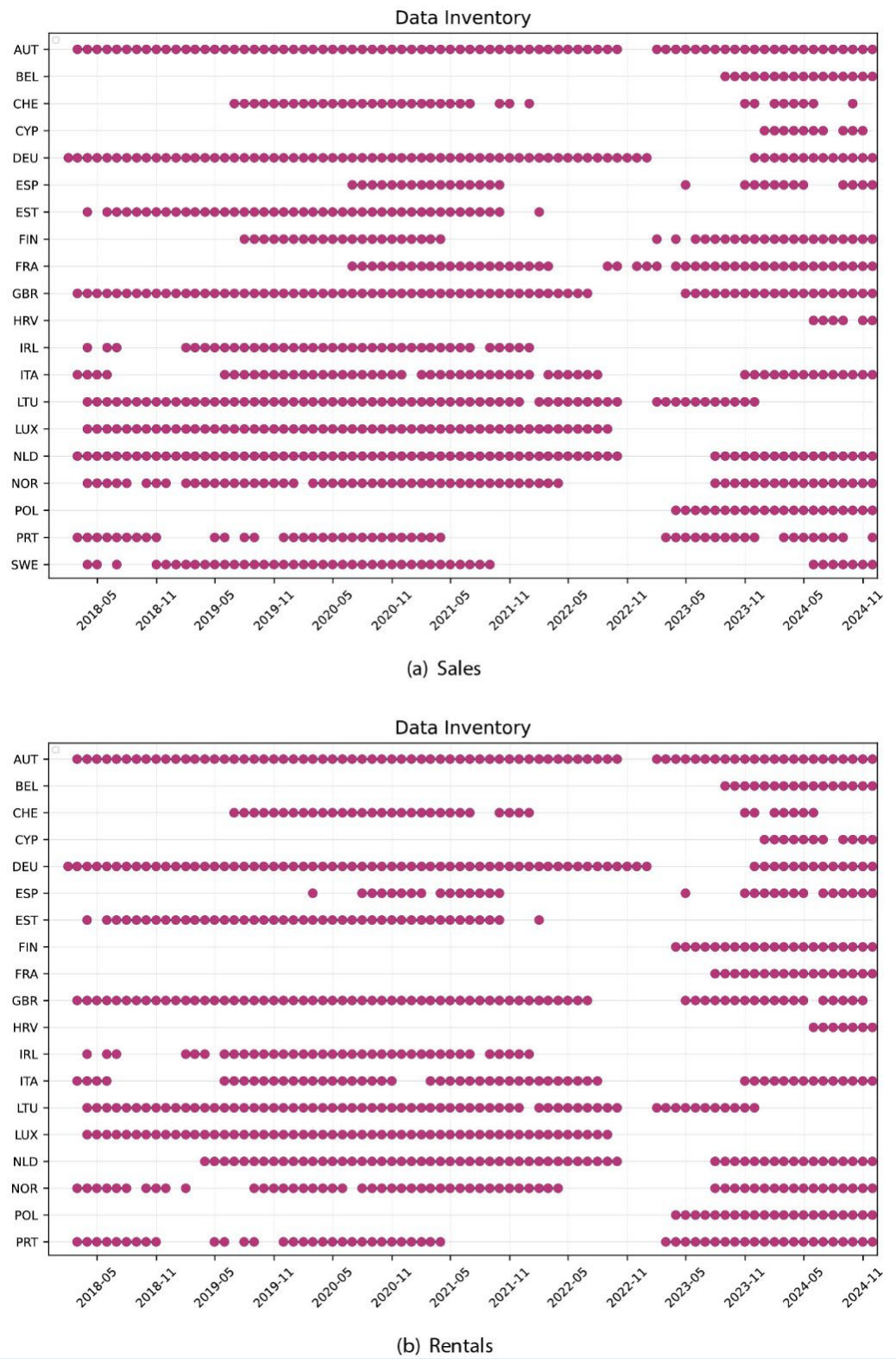
Table
Data sourcing protocol

Field Name	Data Type	Not Null	Aggregated
listing id	character varying	✓	
listing type	character varying	✓	✓
source	character varying	✓	
url	character varying	✓	
date scraped	timestamp with time zone	✓	✓
date listed	timestamp with time zone		(✓)
country	character varying	✓	✓
iso3	character(3)	✓	✓
zipcode	character varying	✓	
address	character varying		
street	character varying		
city	character varying		
province	character varying		
nuts3	character varying		✓
object type	character varying		✓
price	float	✓	✓
currency	character varying	✓	✓
sqm	float		✓
bedrooms	integer		(✓)
bathrooms	integer		(✓)
appendix	json		

Notes: EREI data is aggregated on the NUTS3 level. Naturally, some raw data items are not available in aggregated form. See column 'Aggregated' for available ✓and partially available (✓) data items.

Figure 2 indicates the data availability for each country and year after the validation process. The final dataset captures the underlying structure of European real estate markets at a granular regional level while preserving comparability over time and across countries.

Figure 2
Data inventory per country and month



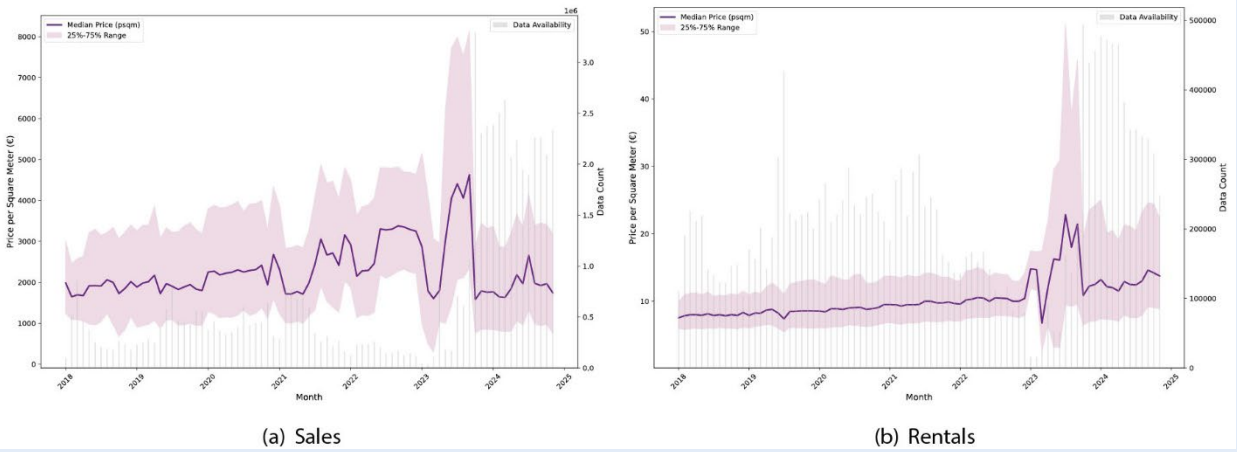
Notes: Figure 2 shows the availability of quality-checked data per country for both sales and rentals.

3 European Real Estate Markets

3.1 Time-series Developments

We present sales and rental price developments across our sample countries in Figure 3, where (a) shows median sale prices per square meter (solid line). The shaded area around the line indicates the range between the 25th and the 75th percentile. The bars present the number of listings per quarter.

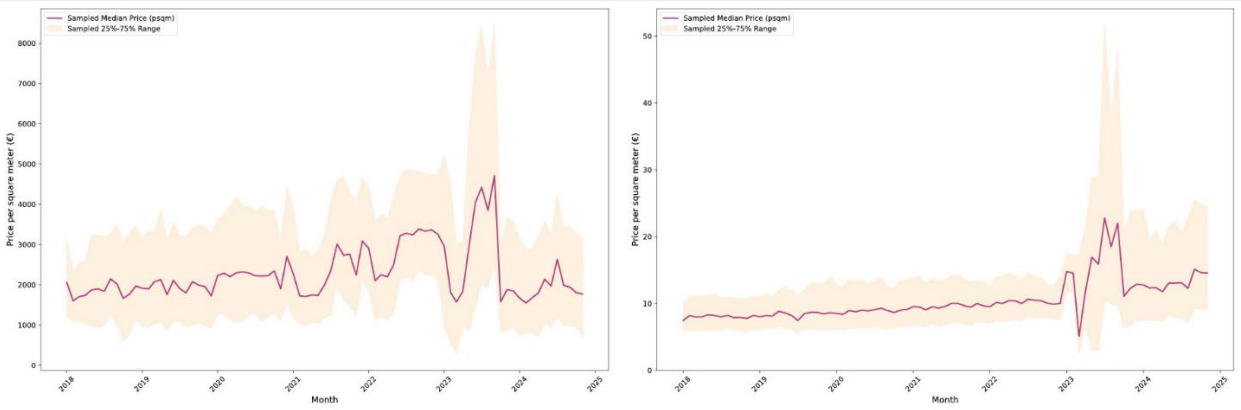
Figure 3
Median sales and rental prices per m^2 over time



Notes: Figure 3 shows developments of sales and rents per square meter across all countries in our sample. (a) and (b) are sales and rentals, respectively. The solid line shows median values, whereas the shaded area around the line indicates the range between the 25th and 75th percentile. The bars indicate the number of listings.

Random sub-samples and bootstrapping means

Figure 3 presents median prices and the interquartile range for the raw sample. This box presents two exercises to check the validity of the information.



We check the developments of median prices by drawing random sub-samples of 7,000 listings per month. The two figures in this box show the corresponding monthly median prices per square meter for sales and rents and their interquartile range. This bootstrapping exercise yields very similar developments in sales and rental prices as in Figure 3(a) and (b).

The median sales price in Figure 3(a) is around EUR 2,000 per square meter over the entire sample period. The interquartile range includes prices up to more than EUR 8,000 per square

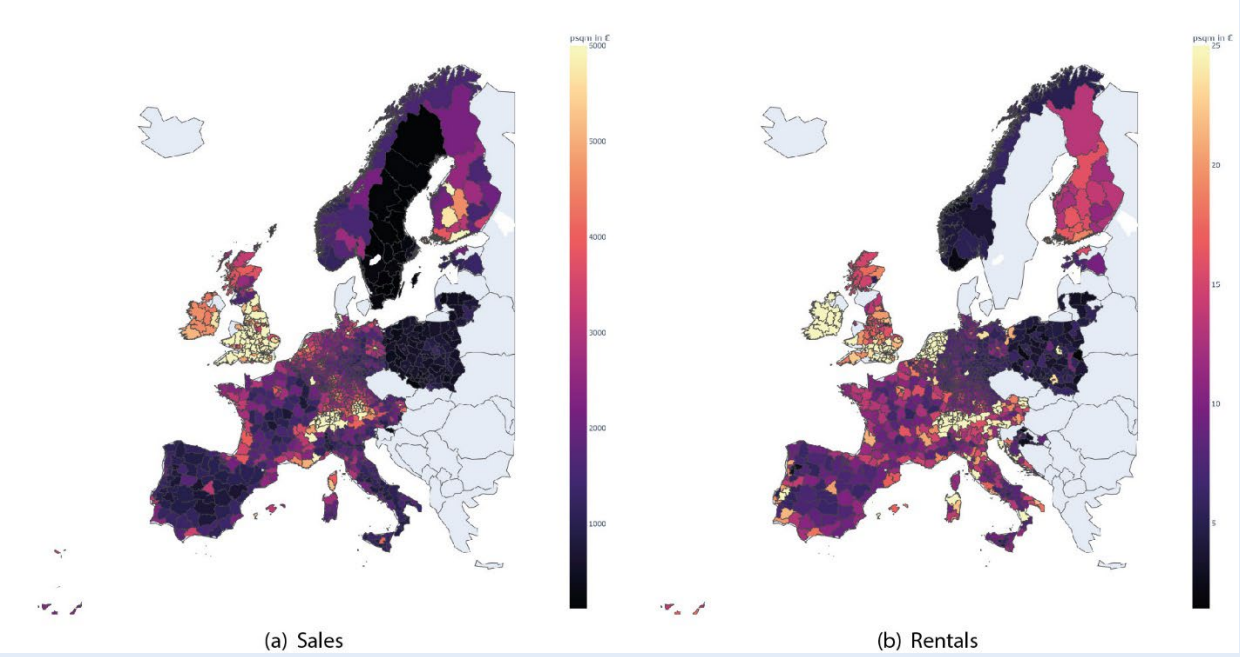
meter. Figure 3(b) presents rental prices per square meter, which have steadily increased from a median of roughly EUR 7.50 to a contemporary value well above EUR 10 per square meter. The interquartile range reveals that rental prices in selected European regions can quote well above EUR 20 per square meter.

Sales and rental prices are calculated from 3,000,000 and 500,000 monthly listings, respectively. 2023 shows a structural break in the number of listings, reflecting a change in methodology and a substantial expansion of our infrastructure. This enabled the acquisition of significantly more data and the inclusion of additional European countries.

3.2 Spatial Variation in Real Estate Prices

Figure 4(a) shows that sales prices are very heterogeneous in most countries and are usually the highest around capitals. Switzerland, the United Kingdom, and Ireland stand out in this regard; sale prices in all NUTS3 regions in these markets are very high compared to the rest of European countries. Overall, the picture for rental prices in Figure 4(b) is similar, although the United Kingdom is much more diverse across regions regarding rents. Rental offers in the Netherlands, Norway, and Finland are, in turn, at substantially higher levels throughout these countries. This pattern reflects that home ownership is much more common in those countries compared to, for example, Germany.

Figure 4
Average sales and rental prices per m^2 across NUTS3 regions



Notes: Figure 4 shows prices per square meter for each NUTS3 region, averaged across the entire sample period, where (a) and (b) are sales and rentals, respectively. In order to improve visualisation, data in this figure is truncated at EUR 6,000 (EUR 25) per m^2 for sale (rental) properties.

Documenting these structural differences within and across European countries highlights the importance of comparable real estate data to evaluate any European policymaking interacting with these different regional real estate markets, such as monetary policy or European fiscal support measures to combat the COVID-19 pandemic.

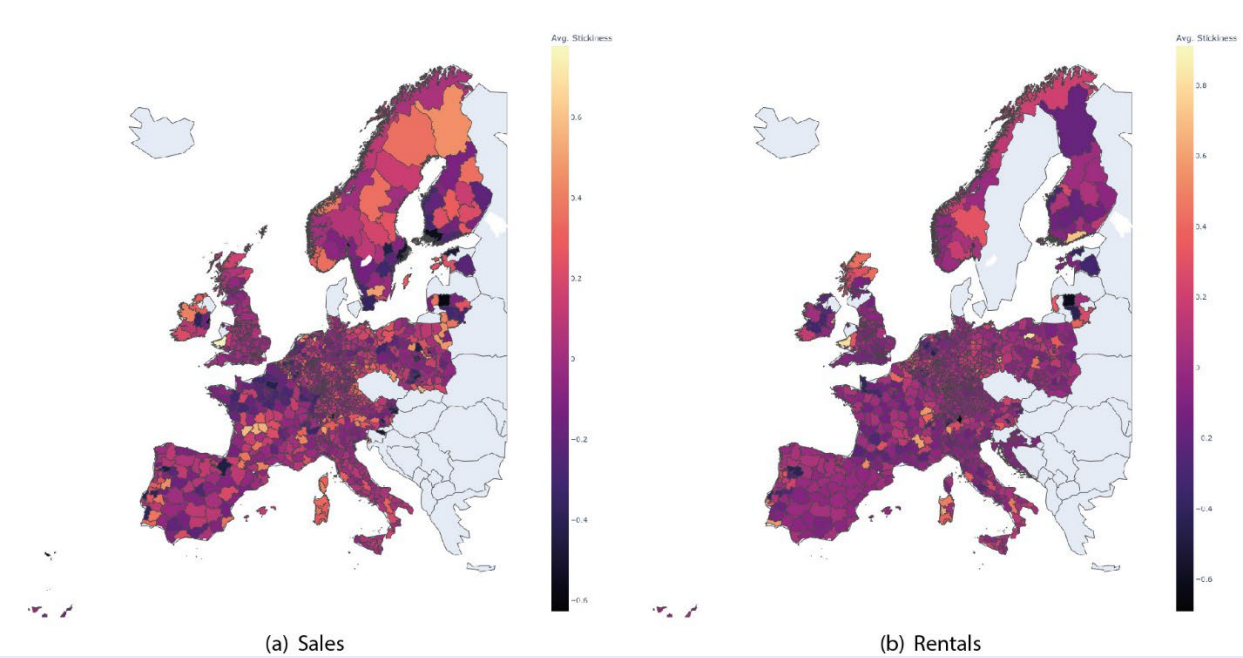
Figure 4 provide average prices per square meter for each NUTS3 region that we can identify in our data. Figure 4(a) shows sales, whereas Figure 4(b) provides information for rentals.

3.3 Real Estate Market Liquidity

Market liquidity, in our sense, is the readiness of a property to be rented out or sold. Financial markets know several proxies for liquidity, such as trading (transaction) volume or the trade-off between the time to sell a large block order and its impact on market prices (*Pastor* and *Stambaugh*, 2003). In real estate markets, however, deriving analogous measures is more challenging due to heterogeneous asset characteristics, market fragmentation, limited transaction frequency, and longer negotiation processes. Moreover, the lack of centralised trading venues and uniform price quotations complicates measuring how quickly properties can be converted into cash without substantially impacting market prices.

Real estate liquidity was a key issue during the 2007/2008 financial crisis when buyers vanished, trading slowed dramatically, and premia for illiquid properties rose sharply. Despite its importance for financial stability and monetary policy, systematic and timely measures of real estate liquidity remain elusive. Existing indicators like survey-based measures are slow, incomplete, or limited to specific regions.

Figure 5
Normalised dwell time (stickiness) across NUTS3 regions



Notes: Figure 5 shows the mean-normalised dwell time within countries, hence, the deviation of a NUTS3 region from its country average.

Unlike financial markets, real estate markets are less transparent and often more localised. Public listings, however, provide an opportunity. The time a property remains listed before being sold or rented offers a direct measure of liquidity. Shorter listing periods suggest brisk markets, while longer durations indicate weaker demand and lower liquidity.

We track the "dwell time" of individual listings on their respective platforms to measure this liquidity dimension. Specifically, we record the date a property is listed[2] and the date it disappears from the platform (i.e., is no longer available), indicating that it has likely been sold or rented out. Comparing changes in "dwell time" over time and in the cross-section provides a comparable liquidity measure for European real estate markets.

[2] Or the date it first appears in the dataset, if a listing date is not available.

Figure 5 presents spatial variation in market liquidity, averaged over time. More specifically, we mean-normalise the "dwell time" within each country. The figure, therefore, shows the deviation of a NUTS3 region from its country average. A higher value (stickiness) suggests a comparatively less liquid market. We observe substantial variation within and across countries, with some regions experiencing dwell times more than 60% higher than the country average.

4 Conclusion

The data are available for non-commercial use at the level of NUTS3 regions. It can be accessed via the procedure outlined by the Research Data Centre of the IWH at this web page.

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