Koetter, Michael; Noth, Felix; Wöbbeking, Carl Fabian

Working Paper

Do online real estate listing prices gauge transaction prices (well)? Evidence from novel near-real-time data

IWH Discussion Papers, No. 13/2026

Provided in Cooperation with:
Halle Institute for Economic Research (IWH) – Member of the Leibniz Association

Suggested Citation: Koetter, Michael; Noth, Felix; Wöbbeking, Carl Fabian (2026) : Do online real estate listing prices gauge transaction prices (well)? Evidence from novel near-real-time data, IWH Discussion Papers, No. 13/2026, Halle Institute for Economic Research (IWH), Halle (Saale), https://doi.org/10.18717/dp09-fw05

This Version is available at:
https://hdl.handle.net/10419/343544

IWH
Halle Institute for Economic Research
Member of the Leibniz Association

Discussion Papers

No. 13
August 2026

Do Online Real Estate Listing Prices Gauge Transaction Prices (Well)? Evidence from Novel Near-Real-Time Data

Michael Koetter, Felix Noth, Fabian Woebbeking

https://doi.org/10.18717/dp09-fw05

Authors

Michael Koetter
Halle Institute for Economic Research (IWH) – Member of the Leibniz Association, Department Financial Markets, and Otto von Guericke University Magdeburg
E-mail: michael.koetter@iwh-halle.de
Tel +49 345 7753 727

Felix Noth
Halle Institute for Economic Research (IWH) – Member of the Leibniz Association, Department Financial Markets, and Otto von Guericke University Magdeburg
E-mail: felix.noth@iwh-halle.de
Tel +49 345 7753 702

Fabian Woebbeking
Halle Institute for Economic Research (IWH) – Member of the Leibniz Association, Department Financial Markets, and Martin Luther University Halle-Wittenberg
E-mail: fabian.woebbeking@iwh-halle.de
Tel +49 345 7753 851

Editor

Halle Institute for Economic Research (IWH) – Member of the Leibniz Association

Address: Kleine Maerkerstrasse 8
D-06108 Halle (Saale), Germany
Postal Address: P.O. Box 11 03 61
D-06017 Halle (Saale), Germany

Tel +49 345 7753 60
Fax +49 345 7753 820

www.iwh-halle.de

ISSN 2194-2188

Do Online Real Estate Listing Prices Gauge Transaction Prices (Well)? Evidence from Novel Near-Real-Time Data*

Abstract

We show that online listing prices closely approximate transaction prices across Europe. Our validation uses the IWH European Real Estate Index (EREI), a near-real-time database of monthly purchase prices, rents, listing counts, and time on market for 1,154 NUTS-3 regions in 16 countries since April 2024. With publication lags as short as one month, validated listing prices offer a timely, comparable complement to official house price statistics. Purchase price levels correlate between 0.94 and 0.97 with transaction prices in the five most populous markets, while calibration slopes range from 0.95 to 1.00. Aggregate listing prices exceed benchmark transaction prices by 13% to 22%.

Keywords: asking prices, Europe, house prices, listing data, regional data

JEL classification: C81, R12, R31

* Access to the EREI data is through the dashboard at https://erei.iwh-halle.de/dashboard/.

1 Introduction

Timely real estate valuations matter to policymakers, banks, and households alike. Housing is the largest asset on household balance sheets, shaping the wealth distribution (Kuhn et al., 2020). As mortgage collateral, real estate prices can also feed imbalances that destabilize financial systems (Mian and Sufi, 2009). Yet official house price indices reach market participants late and are hard to compare across borders, especially in heterogeneous Europe. Comparable regional price levels, which affordability and collateral assessments require, are scarcer still (Pionnier and Schuffels, 2021).

Accordingly, the European Commission (2025) calls for faster and finer housing statistics. For Europe, Battistini et al. (2025) approximate regional house prices from securitized-mortgage valuations for eight countries in an annual panel ending in 2019. They show that the European Central Bank's (ECB) common monetary policy transmits differently across regions with heterogeneous housing markets. Further policies hinge on the housing channel too, such as the ECB's supervision of significant banks or place-based macroprudential measures.[1] This letter asks whether online listing prices can heed this call.

Efforts to use online real estate listings at the European level remain experimental (see Eurostat, 2026, for experimental monthly indices in 13 EU countries) or limited to individual countries.[2] We provide a harmonized cross-country validation of regional listing-price levels from the IWH European Real Estate Index (EREI, Koetter et al., 2026), matching 465 units in nine European countries to completed-transaction benchmarks under common admissibility and calibration rules. Koetter et al. (2026) document construction and coverage, this letter tests external transaction-price validity. We find that listing-price levels correlate with transaction benchmarks at 0.94 to 0.97 in the five most populous markets and scale near one-for-one where unit and dwelling mix match.

Our results complement single-country evidence. Anenberg and Laufer (2017) show that US listing-stage quotes reveal transaction-price movements months before transaction indices, Ardila

[1] Kim (2025) documents such spillovers for Korean investor bans.

[2] Breidenbach and Schaffner (2020) provide asking prices at one square kilometer resolution for Germany.

et al. (2021) compare ask and transaction prices in Switzerland, and Wang et al. (2020) construct listing-based house price indices for 274 Chinese cities. Against these single-country designs, we apply one common set of spatial validation rules across nine European transaction systems. For research, the validation turns listing data from a convenience sample into a calibrated complement, usable where transaction statistics arrive late, coarse, or not at all.

2 Data and Validation

EREI. EREI cleans, filters, and aggregates residential listings collected with machine-learning methods to 1,154 NUTS-3 regions in 16 European countries as of April 2024.[3] Koetter et al. (2026) detail collection and construction. The data for a given month appear within the following month.

The NUTS-3 aggregates report, for each region's buy and rent segments, average log price and rent per square meter, log time on market, and listings per month. The extract spans 2024:m4 to 2026:m6 with 44,698 region-month-segment observations, a window still too short for informative change correlations, though the dashboard tracks EREI against the ECB's country-level indicators. The validation uses the buy segment's price per square meter, window-averaged within each region.

Transaction-price benchmarks and matching. Transaction prices are the reference object of official house price statistics (Eurostat and ILO and IMF and OECD and UNECE and World Bank, 2013) and thus anchor our benchmarks. Because EREI is built from asking prices rather than closed transactions, caveats apply. Initial listings, revised ask prices, and final bargained prices are distinct objects (Merlo and Ortalo-Magné, 2004), and online listings face their own composition and duplication issues (Loberto et al., 2022). We therefore compare EREI price levels to the level series behind nine official housing price statistics (Table 1), which arrive between two weeks and several months after their reference period.[4]

A benchmark must meet three criteria. It must report price levels from completed transactions

[3] NUTS-3 is the finest standard level of the EU's regional classification, districts, departments, or provinces.

[4] The French DVF files appear twice a year.

rather than appraisals or a pure index. It must cover regions, not only the country. And it must overlap EREI's young window. Nine of the 16 EREI countries have such a source. GREIX prices German cities from notary records, the UK HPI scales registry sales, DVF collects French notarized sales, CBS reports Dutch Kadaster transactions, INE and StatFin draw on Portuguese and Finnish tax records, Statbel on Belgian deeds of sale, SSB on Norwegian broker-reported sales, and Notariado on Spanish notarized deeds. The other eight benchmarks span their countries in full. That only nine countries pass is itself the data gap the index addresses. The appendix details each source, plots the underlying scatters, and covers the seven failing countries.

Comparison requires common units in space and time. In space, we merge on NUTS-3 identifiers where the benchmark geography coincides, as with Spanish provinces, and aggregate otherwise, local authorities to NUTS-3 with sales weights in the UK, municipalities to regions in Finland. In time, we average monthly EREI prices to each benchmark's frequency, quarters or years, and keep the region-periods observed on both sides. Window means per region give the cross-section each row compares. The nine countries cover 870 of the 1,154 EREI regions, and the matching keeps 465 comparison units, the gap owed almost entirely to GREIX pricing 21 of Germany's 400 regions (Table A2).

Results. Table 1 reports Pearson and Spearman (rank) correlations of log price levels and the calibration slope, the coefficient from a regression of log EREI on the log benchmark, with its R^2. A slope of one means listing prices scale one-for-one with transaction prices. Where both sides measure euro per square meter over a matching dwelling mix, the table also reports the median ratio of asking to transaction price, the wedge.

The cross-section of levels lines up closely throughout. In the five most populous markets, correlations are 0.97 for GREIX, 0.96 for Notariado, 0.95 for the UK HPI and DVF, and 0.94 for CBS. The smaller four run from 0.82 to 0.95, the two weaker fits tracing to mismatched benchmark objects, per-dwelling house medians in Belgium (rank correlation 0.93) and housing-company flats in Finland. Appendix Table A3 adds capital-region exclusions, leave-one-out and overlap screens,

and bounds on the slopes that allow for measurement error in the benchmarks.

Calibration slopes cluster on the one-for-one line where benchmark and index share unit and dwelling mix, 0.95 for GREIX and Notariado, 1.00 for DVF. The three remaining per-square-meter benchmarks depart for visible reasons. Portugal's 1.17 sets a rolling transaction median against averaged listing prices, which also inflates its 48% wedge. Finland's 1.47 prices housing-company flats, a universe without detached houses. Norway's 0.76 reflects dispersion, EREI varies a fifth less across its 15 counties than the benchmark, correlation 0.94. On the three closest per-square-meter comparisons, aggregate listing-to-transaction ratios run from 1.13 to 1.22. These ratios are not bargaining discounts. Unmatched dwellings and, for Germany and France, mean-over-median aggregation enter them too, and Germany's ratio falls to 1.02 under geometric aggregation (Table A3). The near-unit slopes imply that regional affordability and collateral comparisons based on EREI preserve transaction-price gradients where universe and unit align.

3 Conclusion

Online listing prices carry a spatial transaction-price credential across the 465 units where transaction benchmarks exist at all. Where benchmarks do not reach, EREI's 1,154 regions in 16 countries provide monthly prices now. The validation supports timely regional level comparisons, and the same benchmarks allow testing month-on-month changes as the index matures. The data are accessible through the public EREI dashboard and API.

Table 1: EREI buy prices against transaction-based benchmarks.

		Spatial	Correlation		Calibration		
Benchmark	Provider	units	Pearson	Spearman	Slope	R^2	Wedge
GREIX (DE)	Kiel Institute	21	0.97	0.97	0.95 (0.06)	0.95	1.13
UK HPI	HM Land Reg./ONS	157	0.95	0.94	0.93 (0.03)	0.91	—
DVF (FR)	DGFiP	97	0.95	0.96	1.00 (0.07)	0.89	1.13
CBS (NL)	CBS/Kadaster	40	0.94	0.91	1.08 (0.07)	0.88	—
INE (PT)	Statistics Portugal	26	0.95	0.94	1.17 (0.09)	0.91	1.48
Statbel (BE)	Statbel/FPS Fin.	42	0.83	0.93	0.87 (0.10)	0.70	—
SSB (NO)	Statistics Norway	15	0.94	0.90	0.76 (0.06)	0.89	—
StatFin (FI)	Statistics Finland	18	0.82	0.67	1.47 (0.20)	0.67	—
Notariado (ES)	Consejo Gen. Not.	49	0.96	0.95	0.95 (0.04)	0.93	1.22

Notes: Each row compares EREI buy prices (EUR/m^2, region-month averages of listing prices) with a transaction-based benchmark, across the window means of the spatial units observed in both samples. Correlations are on log levels. Calibration is the slope and R^2 of log EREI on the log benchmark, with the heteroskedasticity-robust (HC3) slope standard error in parentheses. Wedge is the median ratio of the EREI asking price to the benchmark, reported for the euro-per-square-meter benchmarks, with Finland suppressed because its housing-company universe excludes detached houses. Providers, geography, units, frequency, aggregation caveats, and property-type consistency checks are in appendix Table A1.

References

Amaral, F., Dohmen, M., Schularick, M., and Zdrzalek, J. (2023). German Real Estate Index (GREIX). ECONtribute Discussion Papers 231, ECONtribute.

Anenberg, E. and Laufer, S. (2017). A More Timely House Price Index. *Review of Economics and Statistics*, 99:722–734.

Ardila, D., Ahmed, A., and Sornette, D. (2021). Comparing Ask and Transaction Prices in the Swiss Housing Market. *Quantitative Finance and Economics*, 5(1):67–93.

Battistini, N., Falagiarda, M., Hackmann, A., and Roma, M. (2025). Navigating the Housing Channel of Monetary Policy across Euro Area Regions. *European Economic Review*, 171:104897.

Breidenbach, P. and Schaffner, S. (2020). Real Estate Data for Germany (RWI-GEO-RED). *German Economic Review*, 21(3):401–416.

Consejo General del Notariado (2026). Portal Estadístico del Notariado: Precio Real de la Vivienda. `https://penotariado.com/inmobiliario`.

Direction Générale des Finances Publiques (2026). Demandes de valeurs foncières. `https://www.data.gouv.fr/datasets/demandes-de-valeurs-foncieres`.

European Commission (2025). The European Affordable Housing Plan. Communication COM(2025) 1025 final, Strasbourg.

Eurostat (2026). Feasibility of Monthly House Price Indices and Price-Level Indicators from Web-Scraped Data. Statistical Working Papers KS-01-26-025, Publications Office of the European Union, Luxembourg. doi:10.2785/5813495.

Eurostat and ILO and IMF and OECD and UNECE and World Bank (2013). *Handbook on Residential Property Prices Indices (RPPIs)*. Publications Office of the European Union, Luxembourg.

HM Land Registry and Office for National Statistics (2026). UK House Price Index. https://landregistry.data.gov.uk/.

Kim, H. (2025). Place-Based Policy and Spillovers in the Housing Market. *Economics Letters*, 248:112242.

Koetter, M., Noth, F., and Woebbeking, F. (2026). European Real Estate Index (EREI) 2026: A Near-real-time European Real Estate Index EREI: Monthly Listing Prices and Rents for Residential Real Estate. IWH Technical Reports 2/2026, Halle Institute for Economic Research (IWH). doi:10.18717/tr17-wa29.

Kuhn, M., Schularick, M., and Steins, U. I. (2020). Income and Wealth Inequality in America, 1949–2016. *Journal of Political Economy*, 128:3469–3519.

Loberto, M., Luciani, A., and Pangallo, M. (2022). What Do Online Listings Tell Us about the Housing Market? *International Journal of Central Banking*, 18(4):325–377.

Merlo, A. and Ortalo-Magné, F. (2004). Bargaining over Residential Real Estate: Evidence from England. *Journal of Urban Economics*, 56:192–216.

Mian, A. and Sufi, A. (2009). The Consequences of Mortgage Credit Expansion: Evidence from the U.S. Mortgage Default Crisis. *Quarterly Journal of Economics*, 124:1449–1496.

Pionnier, P.-A. and Schuffels, J. (2021). Estimating Regional House Price Levels: Methodology and Results of a Pilot Project with Spain. OECD Statistics Working Papers 2021/03, OECD Publishing.

Statbel (2026). Real Estate: Median Sale Prices by Municipality and Arrondissement. https://statbel.fgov.be/en/themes/housing/real-estate.

Statistics Finland (2026). Prices per Square Meter of Old Dwellings in Housing Companies, StatFin table 13mx. https://pxdata.stat.fi/PxWeb/pxweb/en/StatFin/StatFin__ashi/statfin_ashi_pxt_13mx.px/.

Statistics Netherlands (CBS) (2026). Bestaande koopwoningen; verkoopprijzen prijsindex 2020=100, regio (COROP), StatLine table 85819NED. https://opendata.cbs.nl/#/CBS/nl/dataset/85819NED.

Statistics Norway (SSB) (2026). Average Price per Square Meter and Number of Sales of Dwellings, StatBank table 14310. https://www.ssb.no/en/statbank/table/14310.

Statistics Portugal (INE) (2026). House Price Statistics at Local Level: Median Value per m2 of Dwelling Sales (indicator 0012234). https://www.ine.pt.

Wang, X., Li, K., and Wu, J. (2020). House Price Index Based on Online Listing Information: The Case of China. *Journal of Housing Economics*, 50:101715.

Appendix

A1 Benchmark sources

GREIX provides quarterly notary transaction prices per square meter for German cities, which map one-to-one onto NUTS-3 regions (Amaral et al., 2023). Its headline series prices apartments, the dominant dwelling type in the covered cities. The UK House Price Index provides a monthly hedonic price per dwelling for local authorities, which aggregate to NUTS-3 (HM Land Registry and Office for National Statistics, 2026). For France, department-month median prices per square meter are built from notarized sales in the DVF records, which exclude Alsace and Moselle (Direction Générale des Finances Publiques, 2026). Statistics Netherlands reports the quarterly average selling price of existing owner-occupied dwellings from Kadaster land-registry transactions for COROP regions, which coincide with NUTS-3 (Statistics Netherlands (CBS), 2026). Statistics Portugal reports the median sale value per square meter directly at NUTS-3 from stamp-tax records (Statistics Portugal (INE), 2026). EREI coverage of Portugal begins in 2026:m3, so the Portuguese comparison is effectively a point-in-time cross-section over a single overlapping quarter. Statbel reports quarterly median house prices for Belgian arrondissements, excluding Verviers, from registered deeds of sale (Statbel, 2026). Statistics Norway reports quarterly average achieved sale prices per square meter, in kroner, by county (Statistics Norway (SSB), 2026). These sales are reported through the FINN.no platform and cover about 70% of all dwelling sales, and the price variable is the registered purchase price, not an asking price. Statistics Finland reports yearly prices per square meter of housing-company dwellings from transfer-tax records, sales-weighted from municipalities to the NUTS-3 level (Statistics Finland, 2026). For Spain, the Consejo General del Notariado publishes average prices per square meter from notarized deeds by province, NUTS-3 units outside the island provinces, as aggregates over a trailing twelve-month window (Consejo General del Notariado, 2026). The portal updates monthly without stating the window endpoint, and shifting the assumed window by one month moves the Spanish slope between 0.95 and 0.96 and the wedge between 20 and 22%. No benchmark draws on listing prices, every price is a real-

ized transaction value. Table A1 lists the provider, geography, unit, frequency, and publication lag of each source.

Table A1: Transaction-based benchmark sources.

Benchmark	Provider	Geography (→ NUTS-3)	Unit	Frequency	Publication lag
GREIX (DE)	Kiel Institute	Cities	EUR/m^2, apartments	Quarterly	∼6 weeks
UK HPI	HM Land Reg./ONS	Local authorities	GBP per dwelling	Monthly	∼7 weeks
DVF (FR)	DGFiP	Departments	EUR/m^2, notarized sales	Monthly	Apr and Oct
CBS (NL)	CBS/Kadaster	COROP regions	EUR per dwelling	Quarterly	∼3 weeks
INE (PT)	Statistics Portugal	NUTS-3	EUR/m^2, median	Quarterly	∼3.5 months
Statbel (BE)	Statbel/FPS Fin.	Arrondissements	EUR per dwelling, median	Quarterly	∼2.5 months
SSB (NO)	Statistics Norway	Counties	NOK/m^2	Quarterly	∼2 weeks
StatFin (FI)	Statistics Finland	Municipalities	EUR/m^2, housing companies	Yearly	∼4.5 months
Notariado (ES)	Consejo Gen. Not.	Provinces	EUR/m^2, notarized deeds	Rolling 12m	Monthly

Notes: Sources for the benchmarks in Table 1 of the letter. All report realized transaction prices and none carries listing-price information. The UK HPI is hedonic, scaled from Land Registry sales. Norwegian prices are achieved sale prices reported through the FINN.no sales platform, covering about 70% of sales. The UK and Finnish aggregations to NUTS-3 are sales-weighted. The French, Belgian, and Spanish samples exclude Alsace-Moselle, Verviers, and the island provinces. The Portuguese medians and the Spanish aggregates run over rolling twelve-month windows, and the Norwegian series starts in 2025Q1. Publication lag is the typical delay between the end of the reference period and public release. EREI publishes within the following month. The GREIX comparison uses apartment transactions, the dominant listing type in the GREIX cities. The GREIX, DVF, and INE benchmarks are transaction medians, so every wedge in Table 1 combines a list-over-transaction and a mean-over-median component. The Portuguese figure is largest because it compares a 12-month rolling transaction median with the EREI listing average. The GREIX correlation is robust to the property mix, 0.92 for single-family houses (17 cities) and 0.98 for multi-family buildings (8 cities). Restricting the UK comparison to flats, the dwelling type closest to the EREI listing mix, gives 0.97 (157 regions). Splitting DVF by property type gives 0.93 for apartments (97 departments) and 0.92 for houses (97 departments). Splitting the Portuguese medians by category gives 0.95 for existing dwellings (26 regions) and 0.95 for new dwellings (26 regions). The Belgian comparison uses all houses; apartments give 0.81 (40 arrondissements). URLs: GREIX (DE), `https://greix.de`; UK HPI, `https://landregistry.data.gov.uk`; DVF (FR), `https://data.gouv.fr`; CBS (NL), `https://opendata.cbs.nl` (85819NED); INE (PT), `https://ine.pt` (0012234); Statbel (BE), `https://statbel.fgov.be`; SSB (NO), `https://ssb.no` (14310); StatFin (FI), `https://stat.fi` (13mx); Notariado (ES), `https://penotariado.com`.

A2 Sample construction

Matching proceeds in two steps. Spatially, benchmarks whose geographies are NUTS-3 units, Spanish provinces, French departments, Dutch COROP regions, Belgian arrondissements, Norwegian counties, and the Portuguese regions, merge on the NUTS-3 identifier, and GREIX cities map one-to-one onto their NUTS-3 regions. The UK HPI aggregates local authorities to NUTS-3 with sales weights through the ONS lookup, and Finnish municipalities aggregate to maakunta level with sales weights. Temporally, monthly EREI prices average to each benchmark's frequency, quarters for the Dutch, Portuguese, Belgian, Norwegian, and German sources, years for Finland, and the trailing twelve-month window for Spain, before an inner merge on region and period. The window means per region form the cross-sections of Table 1.

Table A2 counts what each step keeps. The nine benchmark countries contain 870 of the 1,154 EREI regions, and every further loss reflects benchmark coverage rather than EREI coverage. Germany drops most units because GREIX prices 21 cities. France loses the four departments that the Livre foncier regime keeps out of DVF. The UK comparison drops five composite or recoded units, and the benchmark's Northern Ireland units find no EREI counterpart. Belgium loses the two Verviers units, Spain the ten island provinces, Finland Åland, and Norway Svalbard and three county codes outside the 2024 NUTS vintage. The Dutch and Portuguese benchmarks match every EREI region, and 465 matched units remain.

Table A2: From raw extract to validation sample.

Benchmark	EREI regions	Benchmark units	Matched units	Region-period obs.
GREIX (DE)	400	21	21	115
UK HPI	162	174	157	3,364
DVF (FR)	101	97	97	1,067
CBS (NL)	40	40	40	360
INE (PT)	26	26	26	26
Statbel (BE)	44	42	42	336
SSB (NO)	19	15	15	90
StatFin (FI)	19	18	18	18
Notariado (ES)	59	49	49	49
Total	870	—	465	5,425

Notes: Each row counts the EREI NUTS-3 regions in the benchmark's country, the spatial units in the benchmark file after its property-type and window filters, the units matched by the inner merge of Table 1, and the matched region-period observations entering the window means. The committed EREI extract holds 44,698 region-month-segment observations for 1,154 regions in 16 countries. The buy segment keeps 21,395 region-months and the positive-price screen drops none of them. The nine benchmark countries account for 15,903 region-months in 870 regions, of which 465 enter the cross-sections, so all further attrition reflects benchmark coverage. The German benchmark prices 21 cities. The French benchmark covers 97 departments because the Livre foncier regime keeps Bas-Rhin, Haut-Rhin, Moselle, and Mayotte out of DVF. The UK benchmark misses West and East Cumbria and two Scottish composites, whose districts span several ITL3 units, and Sheffield, which the HPI file reports under a district code the ONS lookup lacks, while EREI carries no Northern Ireland listings. The Belgian sample loses the two Verviers units, the Spanish provinces exclude the ten Balearic and Canary units, Finland lacks Åland, and Norway loses Svalbard and three pre-2024 county codes. The Dutch and Portuguese benchmarks match every EREI region.

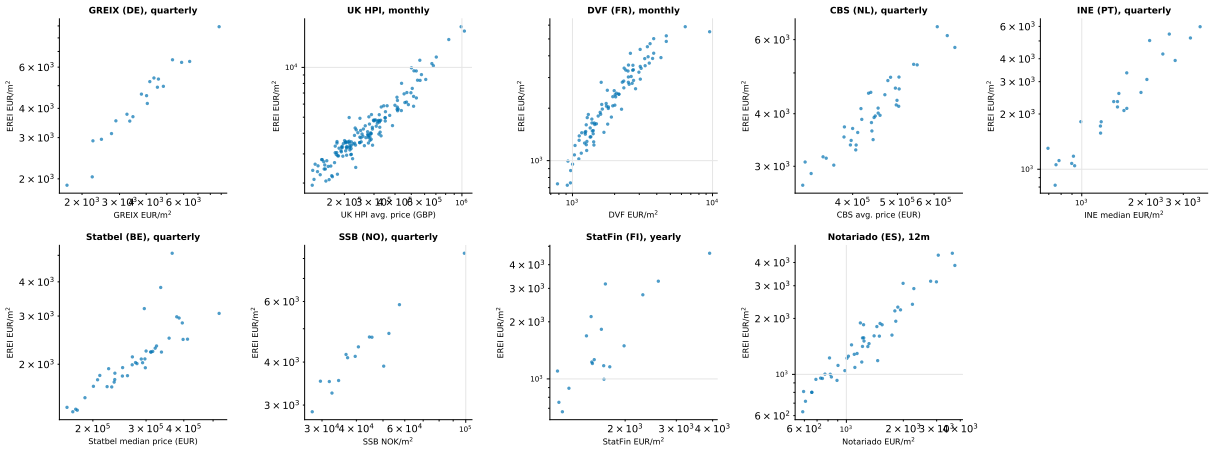
A3 Why the remaining seven countries fail the bar

A source qualifies as a benchmark if it meets three criteria. It must report price levels from completed transactions rather than appraisals or a pure index, it must report them for regions rather than only the country, and it must overlap the EREI window. The remaining seven EREI countries illustrate these criteria. Italy's registry publishes transaction volumes by province but price levels only as appraisal-based ranges. Switzerland's first register-based transaction statistic is announced for the end of 2026. Cyprus has a valuation-based index without levels. Croatia's transaction-based statistics distinguish only three broad zones. Sweden's monthly broker series by municipality is gated, and the open official series is annual and per property. Austria's land-register averages by district are annual only, and Poland's central-bank series covers 17 cities, with registry medians by district published at a lag. The last two are the nearest candidates for future benchmark rows.

A4 Region-level scatters

Figure A1 plots the region-level scatters behind each row of the validation table, window-mean EREI asking prices against the corresponding benchmark, both on log scales.

Figure A1: EREI buy prices against transaction-based benchmarks, by source.



Notes: Each panel plots window means across the spatial units observed in both samples, EREI asking prices per square meter (vertical axis, EUR, log scale) against the benchmark in its own unit (horizontal axis, log scale). Sources, units, and frequencies as in Table A1.

A5 Robustness of the cross-section

Table A3 probes the validation cross-section along the lines a referee would. Excluding each country's capital region leaves seven of nine rows essentially unchanged. The two exceptions are informative. Removing all 21 London units lowers the UK slope from 0.93 to 0.80 while the correlation stays at 0.91, so London carries real weight in the British calibration but not in the ranking. Removing Oslo costs the small Norwegian sample precision. Berlin never enters the German row, since GREIX publishes no per-square-meter price series for it. Requiring at least three matched periods per region leaves the panel sources unchanged and is inapplicable for Spain, a single cross-section by construction, and for Portugal and Finland, where the committed extract overlaps the benchmark in a single quarter and a single year. No single city or county drives any

row, the leave-one-out ranges in the table notes stay within 0.01 of the German correlation and 0.05 of its slope. The errors-in-variables brackets pair the forward slope with the reciprocal reverse-regression slope. For GREIX, the UK, and Spain the bracket is tight around one, so the near-unit calibration is not an attenuation artifact, while the Norwegian bracket sits fully below one and the Finnish fully above, confirming that those two slopes are genuinely away from unity. Aggregating EREI geometrically, as the exponential of the mean log price, shrinks the German wedge from 1.13 to 1.02, so the German list-over-transaction premium net of the mean-over-median component is about 2%. Fat-tailed listing-price distributions make the same exercise uninformative in France, Spain, and Finland.

Table A3: Robustness of the cross-sectional validation.

	Baseline		Excl. capital			Overlap ≥ 3		EIV
Benchmark	Pearson	Slope	n	Pearson	Slope	Pearson	Slope	bracket
GREIX (DE)	0.97	0.95	21	0.97	0.95	0.97	0.97	[0.95, 1.01]
UK HPI	0.95	0.93	136	0.91	0.80	0.95	0.93	[0.93, 1.03]
DVF (FR)	0.95	1.00	96	0.95	1.06	0.95	1.00	[1.00, 1.12]
CBS (NL)	0.94	1.08	39	0.93	1.05	0.94	1.08	[1.08, 1.24]
INE (PT)	0.95	1.17	25	0.95	1.19	—	—	[1.17, 1.29]
Statbel (BE)	0.83	0.87	41	0.83	0.91	0.83	0.87	[0.87, 1.24]
SSB (NO)	0.94	0.76	14	0.88	0.75	0.94	0.76	[0.76, 0.85]
StatFin (FI)	0.82	1.47	17	0.75	1.62	—	—	[1.47, 2.19]
Notariado (ES)	0.96	0.95	48	0.96	0.95	—	—	[0.95, 1.03]

Notes: Each block recomputes the cross-sections of Table 1 under one perturbation. Baseline repeats the Table 1 Pearson correlation and calibration slope. Excl. capital drops each country's capital NUTS-3 unit (all 21 London units for the UK). Berlin is absent from the GREIX sample to begin with (its EUR/m^2 price series is not published), so the German row contains no capital. Overlap ≥ 3 keeps only spatial units with at least three matched periods. The column is inapplicable for the Spanish cross-section and for Portugal and Finland, whose committed overlap is a single quarter and a single year. The EIV bracket is the forward calibration slope and the reciprocal of the reverse-regression slope, which bound the slope under classical measurement error in both log series. Leave-one-out ranges: dropping any single unit gives Pearson 0.97–0.98 and slope 0.91–0.98 for GREIX (21 cities) and Pearson 0.88–0.98 and slope 0.73–0.80 for SSB (15 counties). Under geometric (log-mean) EREI aggregation the German sale-to-list wedge falls from 1.13 to 1.02.

Halle Institute for Economic Research –
Member of the Leibniz Association

Kleine Maerkerstrasse 8

D-06108 Halle (Saale), Germany

Postal Adress: P.O. Box 11 03 61

D-06017 Halle (Saale), Germany

Tel +49 345 7753 60

Fax +49 345 7753 820

www.iwh-halle.de

ISSN 2194-2188

The IWH is funded by the federal government and the German federal states.