International Science Journal of Engineering & Agriculture
2026; 5(3): 18-39
https://isg-journal.com/isjea
doi: 10.46299/j.isjmef.20260503.02
ISSN: 2720-6319

INTERNATIONAL
SCIENCE GROUP

Statistically grounded commonalities and peculiarities of Ukrainian and British residential property markets evolution in recent years of unrest

Valery Yakubovsky
International Business Department of the Institute of International Relations of Taras Shevchenko National University of Kyiv, Kyiv, Ukraine
ORCID: 0000-0002-5161-9271

Oleksiy Bychkov
Department of Information Technologies and Systems of the Taras Shevchenko National University of Kyiv, Ukraine
ORCID: 0000-0002-9378-9535

Kateryna Zhuk
Economic Department of the Taras Shevchenko National University of Kyiv, Ukraine
ORCID: 0000-0001-7725-3397

Abstract: This paper presents a statistically grounded comparative analysis of residential property market evolution in the United Kingdom (2007–2025) and Ukraine (2019–2025) amid disruptive events, including the Global Financial Crisis, Brexit, COVID-19, and the war in Ukraine. Applying a harmonized probabilistic framework to large-scale datasets, the study models price distributions using log-normal laws and evaluates volatility via dispersion metrics.

For proper comparative analysis, the initial data sets collected for the UK and Ukraine residential property markets, which exhibit contracting types of economies, were processed identically using a detailed mat-stat methodology developed. It includes data filtering for duplicates, outliers, and basic metric homogeneity. As such, the price per square meter of the property area was chosen. Following initial data preprocessing and filtering, empirical density distribution functions of housing prices were analysed. In both markets, the log-normal distribution was identified as the closest theoretical model for the cost per square meter of residential property. Such a character was confirmed through Pearson χ^2 tests.

Based on results collected, the role several influential factors was identified. This includes regional polarization, market size evolution with particular attention to the market's key parameters dynamics under the influence of encompassing turbulences. In all cases, the analysis provided was performed in a deterministic and probabilistic manner. In this regard, the coefficient of variation, jointly with dispersion, proved a sensitive indicator of underlying instability, rising sharply in Ukraine. While both countries experienced volume and price shifts under pressure, the UK market's volatility normalized faster, signaling greater resilience and structural maturity.

Findings confirm that while both markets exhibit right-skewed initial distributions, their responses to shocks diverge. The UK displays cyclical dynamics where volatility widens during shocks and narrows during stabilization. Conversely, the Ukrainian market demonstrates persistent, heightened volatility and strong spatial polarization driven by wartime security risks. The analysis proves that dispersion-based indicators, particularly the coefficient of variation, capture market resilience more effectively than average prices. This comparison offers a replicable template for analyzing how structurally different markets absorb overlapping shocks, providing key insights for policymakers and investors.

Keywords: Residential Property; Market Evolution; Comparative Analysis; Dispersion Metrics; Log-Normal Distribution.

1. Introduction

The global residential property landscape is undergoing profound structural shifts triggered by overlapping macroeconomic shocks, geopolitical disruptions, and evolving demographic and behavioral patterns. Much like the post-2007/2008 global financial crisis, the contemporary period is marked by heightened uncertainty, subdued investor sentiment, and volatile capital flows. Events such as Brexit, the COVID-19 pandemic, and the ongoing war in Ukraine have reshaped the fundamentals of real estate markets, challenging traditional valuation models and investment strategies. As a result, market participants, including investors, developers, policymakers, and financial institutions, are compelled to reassess risk exposure, recalibrate pricing models, and seek more sophisticated analytical tools to navigate increasingly complex market conditions.

The United Kingdom and Ukraine present particularly compelling case studies in this regard. The UK residential property market, which is one of the most mature and data-rich globally, has weathered multiple systemic shocks over the last two decades, including severe housing market contraction following the 2007/2009 global financial crisis, structural changes in demand and supply dynamics triggered by Brexit, and the pandemic-induced surge in housing demand followed by a monetary tightening cycle. Ukraine's residential property market, while less mature and data-reach, has experienced an entirely different trajectory. Since 2019, its development has been shaped by acute shocks, including the COVID-19 pandemic and, most significantly, the ongoing war, which have disrupted supply chains, displaced populations, and reshaped demand patterns. Despite these challenges, housing continues to play a central role in these countries as both a strategic asset class and a critical social good.

2. Object and subject of research

Regarding the important role of residential property in different economies, it seems essential to provide an in-depth, statistically meaningful analysis of appropriate markets evolution in recent turbulent years. For comparison purposes, as a research object, two contrasting economies were selected where these markets are evolving, i.e., well-established in the United Kingdom and less developed in Ukraine.

Such a type of analysis should be based on initial data sets processed similarly. For Ukraine, the study is grounded on the proprietary VERITEX® Group database, which aggregates transaction-level and offer-level data across all 24 country regions. By mid-2025, this database contains approximately 2.66 million unique apartment offers, covering both primary and secondary markets, with 90 % share dominance of the secondary sector. The database was constructed through systematic monitoring of online portals, agency listings, and regional aggregators, followed by rigorous deduplication and validation treatment.

For the United Kingdom, the analysis draws on large-scale public datasets, including the UK House Price Index (ONS), Land Registry transaction records, and the London Datastore. These sources provide long historical time series with national and regional coverage, enabling robust temporal and spatial comparisons.

The main subject of the research is oriented to provide statistically grounded comparative analysis of residential property market evolution in the United Kingdom (2007–2025) and Ukraine (2019–2025) amid disruptive events, including the Global Financial Crisis, Brexit, COVID-19, and the war in Ukraine.

The primary motivation behind this research lies in addressing a critical knowledge gap: while both markets have been the subject of extensive individual analyses, there is a lack of comparative, statistically robust research that captures their co-evolution under conditions of systemic stress. By bridging this gap, the study provides deeper insights into the structural dynamics of residential real estate markets, offering evidence-based guidance for policymakers, investors, valuers, and other stakeholders seeking to anticipate market shifts and mitigate systemic risks.

3. Target of research

A major obstacle in analysing these markets, particularly in the Ukrainian context, has been the absence of a unified, high-quality data infrastructure that captures transaction-level detail, pricing structures, and regional variation. This gap has significantly limited the precision of valuation models and forecasting tools, especially in periods of heightened volatility. Addressing this gap requires robust analytical approaches capable of processing large, heterogeneous datasets and extracting statistically meaningful insights under conditions of uncertainty.

This study aims to address these challenges by conducting a statistically grounded, comparative analysis of two contrasting residential property markets: one of well-developed in the United Kingdom and the other of less matured in Ukraine. Using large-scale datasets compiled from national statistical agencies, industry reports, and proprietary market databases a comprehensive methodological framework has been implemented based on probabilistic and deterministic analysis. This includes modelling price distributions according to proven log-normal laws, assessing volatility through dispersion measures such as variance and coefficient of variation, and analysing multi-factor correlations.

4. Literature analysis

The empirical literature on housing markets is extensive for mature economies and substantially thinner for emerging or conflict-affected markets. For the United Kingdom and other advanced economies, a large body of work documents cyclical boom–bust behaviour, strong regional heterogeneity, and robust relationships between housing prices and basic metrics such as GDP growth, inflation, interest rates, and credit conditions [11], [15], [16]. Empirical practice in these settings increasingly adopts probabilistic and distributional diagnostics—such as log-transformations, log-normal fits, and volatility metrics to account for price skewness and heavy tails [4], [13].

Studies of submarket heterogeneity further demonstrate the value of regional disaggregation and typology-specific analysis, e.g. flats versus detached houses. Contemporary researches demonstrate that housing markets are best understood as a collection of overlapping submarkets, where spatial and typological segmentation significantly improves predictive accuracy and policy relevance [2], [8], [13], [22]. Mature public data systems in the UK and other advanced economies allow for relatively precise time-series and cross-sectional inference, enabling robust hedonic and spatial econometric modelling [3].

By contrast, the literature addressing Ukrainian housing is far more limited. Existing market reports and academic notes tend to concentrate on descriptive price series, and policy interventions including mortgage support schemes, and emergency housing programs rather than on fully probabilistic or comparative statistical analyses [5], [19]. Where advanced statistical tools are applied to Ukrainian data, they are constrained by data coverage, inconsistent transaction reporting, and temporal gaps that preclude long historical series prior to 2019 [6]. The recent national reports compiled by consulting-engineering Group VERITEX® and complementary UK market syntheses by June 2025 attempt to compensate this gap by assembling transaction-level and offer-level datasets and by applying modern mathematical–statistical procedures such as outlier filtering, log-normal fitting, and calculation of basic markets volatility metrics. This demonstrates the feasibility of detailed statistical processing even in data-poor contexts and provides a new basis for rigorous cross-country comparison.

Across the better-documented literature and the national reports, some empirical regularities recur. Price levels and volatility differ markedly across different regions. In established markets, this heterogeneity is primarily driven by local fundamentals such as employment, accessibility, and supply constraints [11], [15], [22]. In conflict- or shock-affected contexts, however, security conditions and displacement pressures dominate regional divergence. Ukrainian evidence in recent

years shows pronounced polarization, with western cities experiencing rapid appreciation while frontline regions remain severely depressed [5], [21].

Housing markets respond to macro shocks, including financial crises, pandemics, and policy changes, through simultaneous movements in prices, volumes, and dispersion. Large shocks not only shift central tendencies but also widen dispersion and alter tail behaviour [3], [16]. The global financial crisis and COVID-19 pandemic both demonstrated this pattern in mature economies, while in Ukraine wartime displacement has induced even sharper distributional shifts [7], [19].

However, despite the progress represented by recent national reports, comparative statistically grounded cross-country studies are scarce. While numerous robust studies exist for individual national markets, especially the UK [11], [15], [16], there are very few works that apply identical probabilistic methodologies across both a mature market and evolving being conflict-affected market. Methodological differences and inconsistent data handling often prevent direct, apples-to-apples comparison of volatility metrics and tail behaviour. This limits ability to generalize how similar macro shocks and overall tendencies manifest in structurally different housing systems.

Several studies emphasize price levels and growth rates but do not systematically treat variation measures: variance, standard deviation, and coefficient of variation, as central comparative outcomes. Yet such volatility metrics are particularly informative with respect to market predictability and resilience. Their temporal evolution under different repeated shocks remains underexplored in comparative perspective [4], [13].

Research in Ukrainian market has been hindered by the lack of a comprehensive, public transaction database with incomplete listings or offer-level portals [7], [19]. While the VERITEX® Group database represents an important improvement, the academic literature still lacks demonstrations of fully probabilistic pipelines—robust outlier filtering, distributional fitting, and confidence interval construction—that are transparent, replicable, and validated across both mature and emergent datasets.

The study presented here directly targets the identified gaps. Implementation of an identical deep statistical pipeline identically applied on both the British and Ukrainian housing datasets enables rigorous cross-country comparison of their evolution, distributional shapes and volatility dynamics.

Moreover, it elevates volatility metrics to a primary comparative role, tracking how they evolve before, during, and after each macro shock covered by respective datasets in relations to key indicators within each country.

In general, this study intends to fill in these gaps by leveraging harmonized datasets and a shared math-stat methodology to reveal both commonalities and context-specific peculiarities in contrasting housing markets evolution during recent years of unrest.

5. Research methods

The choice of methodology for this comparative research was guided by the need to ensure accuracy, transparency, and replicability across two structurally different housing markets those in the United Kingdom and Ukraine. Both deterministic and probabilistic approaches were employed to capture the dynamics of housing price evolution under systemic shocks. This dual framework allows us to identify cause-and-effect relationships while also quantifying uncertainty levels and distributional patterns.

The methodological design integrates several stages: (i) data collection and preprocessing; (ii) statistical filtering and cleaning; (iii) descriptive and distributional analysis; (iv) probabilistic modelling of price distributions; and (v) factor and comparative analysis. This multi-layered approach ensures that both central tendencies and volatility measures are robustly estimated, enabling meaningful cross-country comparison.

To ensure consistency, all raw datasets underwent an identical preprocessing pipeline:

- Outlier detection and removal using the Romanovsky criterion for statistical outliers.
- Deduplication of repeated listings based on geographic and attribute matching.

- Homogeneity checks to validate consistency across different data sources.
- Logarithmic transformation of price per square meter values to normalize skewed distributions.

This harmonized filtering procedure was applied identically to both the UK and Ukrainian datasets, ensuring methodological comparability.

Following initial data preprocessing and filtering, empirical density distribution functions of housing prices were estimated and fitted to theoretical distributions. In both markets, the log-normal distribution was identified as the closest theoretical model for the cost per square meter of residential property, confirmed through Pearson χ^2 tests.

Key distributional parameters including mean, median, standard deviation, coefficient of variation were calculated for national and regional samples. Confidence intervals with 95.46% probability level, corresponding to $\pm 2\sigma$ were constructed to capture the range of expected variation. This probabilistic framework allows for systematic comparison of volatility metrics across markets and over time.

Time frame for Ukrainian residential property market was limited to the period 2019-2025 by dataset availability when for British case data set processed relates to the period 2005-2025 to analyse last GFC effect on market evolution.

The novelty of this study lies in the application of an identical probabilistic pipeline to both a mature British and a conflict-affected Ukrainian housing markets. By standardizing data cleaning, distributional fitting, and volatility analysis, cross-country comparisons were ensures being not confounded by methodological inconsistencies.

6. Research results

Overview of the Ukrainian residential property market evolution. The Ukrainian real estate sector remains heavily influenced by recent shocks. In early 2022 the full-scale Russian invasion caused transaction volumes to plunge (Fig. 1). Secondary housing sales in 2024 were still only about 70–75% of pre-war and pre-pandemic levels. The total number of secondary-market apartment deals in 2024 was roughly 14% higher than in 2023, but still well below 2019 figures. During 2022–2023 the market was characterized by high uncertainty: many buyers and sellers pulled back, causing a sharp reduction in activity.

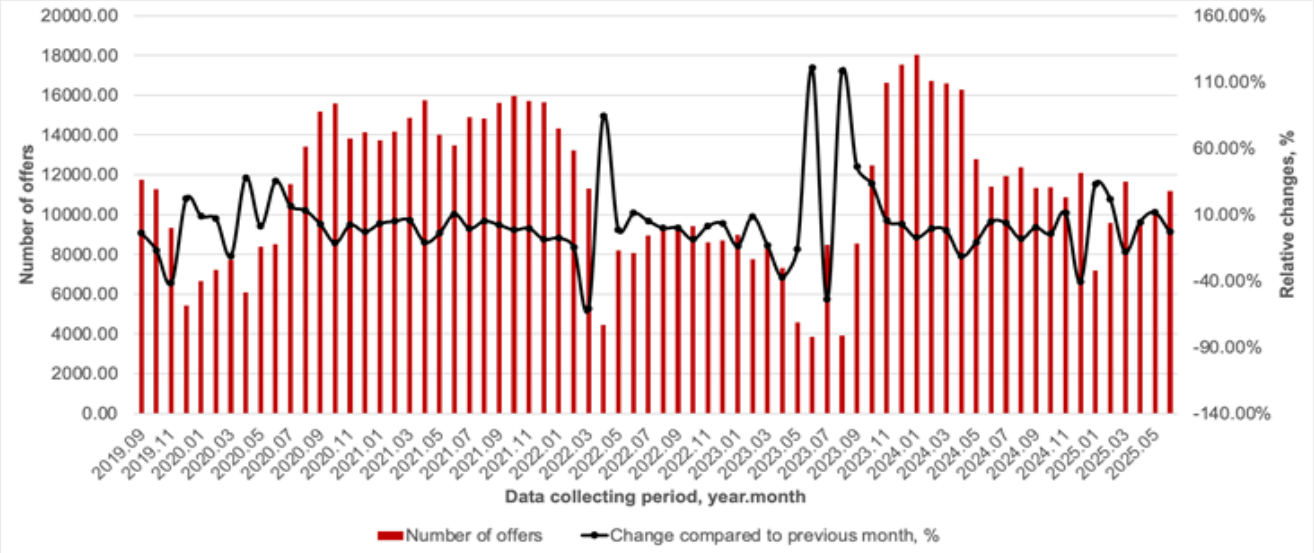

Figure 1. Dynamics of the number of offers on the secondary apartment market in Ukraine as of June 2025. Source(s): Author's own creation based on VERITEX® Group data (2025).

By 2024–2025, the market began a cautious recovery. Transaction volumes rebounded in the first half of 2025, the number of apartment offers was nearly on par with the same period in 2024. Seasonal cycles are pronounced: deep winter troughs give way to strong spring surges. Overall, listed apartment prices have stabilized and in some cases risen modestly.

Between 2019 and 2025, the Ukrainian secondary housing market experienced a sequence of pronounced shocks and partial recoveries, clearly reflected in the dynamics of median and marginal (95.46%) price levels (Fig. 2). The pre-pandemic period of 2019 showed relative stability, followed by a temporary contraction in 2020 during the COVID-19 crisis. In 2021, a short-lived rebound pushed median prices to local peaks, before the full-scale invasion in early 2022 triggered a sharp decline in both transaction volumes and price stability.

From mid-2022 through 2023, the market remained highly volatile, with wide confidence intervals reflecting uncertainty and regional polarization. By late 2024, a cautious recovery was underway: the national median hovered around 1,100 USD/m², compared to approximately 1,200 USD/m² at the start of that year. In the first half of 2025, seasonal cycles again became visible, with winter troughs and spring surges, though the overall median decreased to about 1,013 USD/m² by June 2025.

Thus, the 2019-2025 trajectory demonstrates how successive systemic shocks, like pandemic, war, and macroeconomic instability, reshaped the Ukrainian housing market, with volatility metrics proving more sensitive indicators of resilience than average price levels alone.

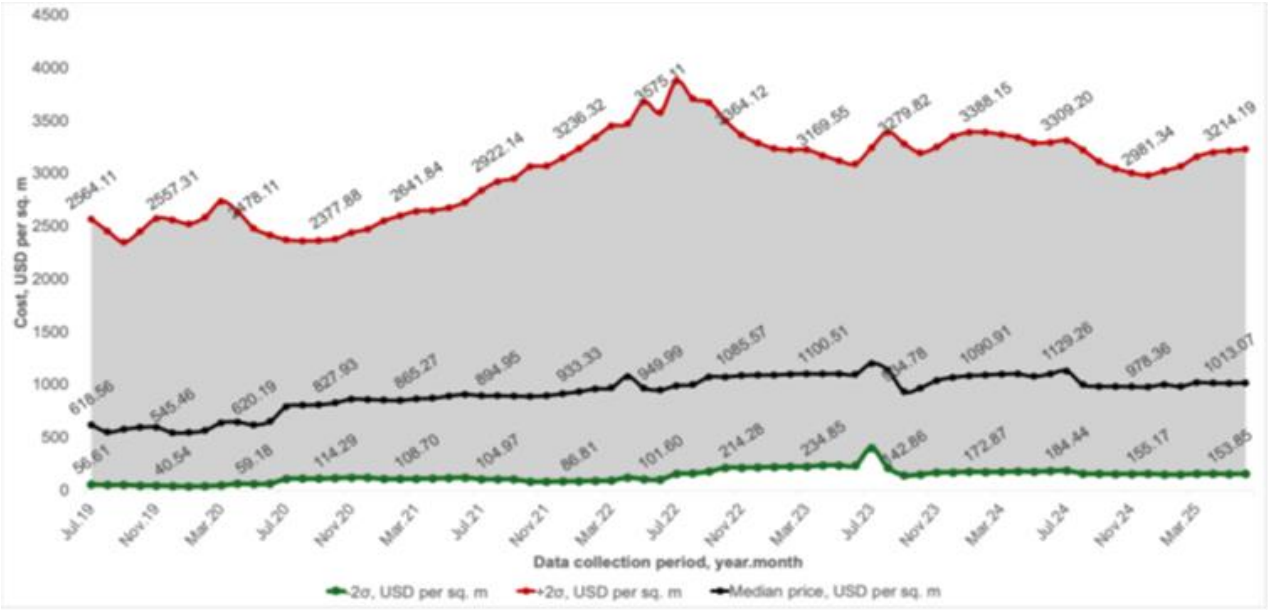

Figure 2. Dynamics of the median and marginal (95.46%) levels of the cost per square meter of housing in Ukraine as of June 2025. Source(s): Author's own creation based on data from VERITEX (2025).

Ukraine’s market composition is dominated by the secondary stock with over 90% of apartment listings occupied by 1–3 room flats and the total number of existing offers for sale amounted to 77,024 as of mid-2025. For 3-room apartments, this share is also significant, reaching 24.2% when large apartments (4 rooms or more) comprise only 5.40% of listings (Fig.3).

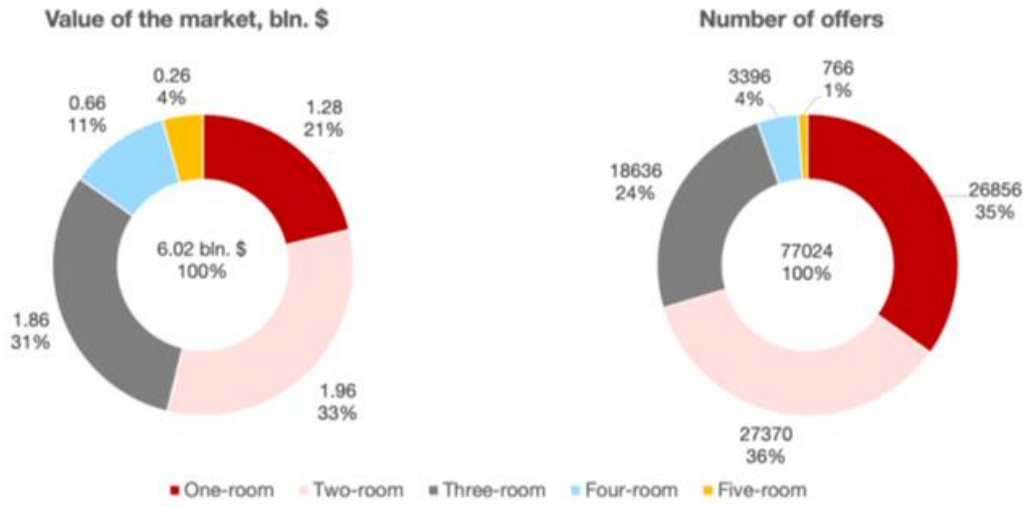

Figure 3. Volume of the secondary apartment market in Ukraine as of June 2025
Source(s): Author's own creation based on data from VERITEX (2025).

In monetary terms, the volume of the secondary apartment market in Ukraine in June exceeded $6.02 billion. The largest share belongs to two- and three-room apartments, with 32.56% and 30.90%, respectively, while one-bedroom apartments constitute 21.26% with rest split between 1-room and 4 and more rooms apartments (Fig.3).

Such picture is quite natural as it reflects the historical evolution of demand over last decades that was skewed toward small units. The median apartment size sold in 2024 was only ≈48 m² with one- and two-bedroom flats being the most liquid segments and aging over 35 years. This means many buyers are purchasing properties that require renovation, which keeps transaction prices comparatively low.

As a result, the price distribution is asymmetric with pronounced positive or right-sided asymmetry (Fig.4). The majority of apartment costs are within the range 600–1 200 USD/sq. m. when a few high-end units pull up the averages.

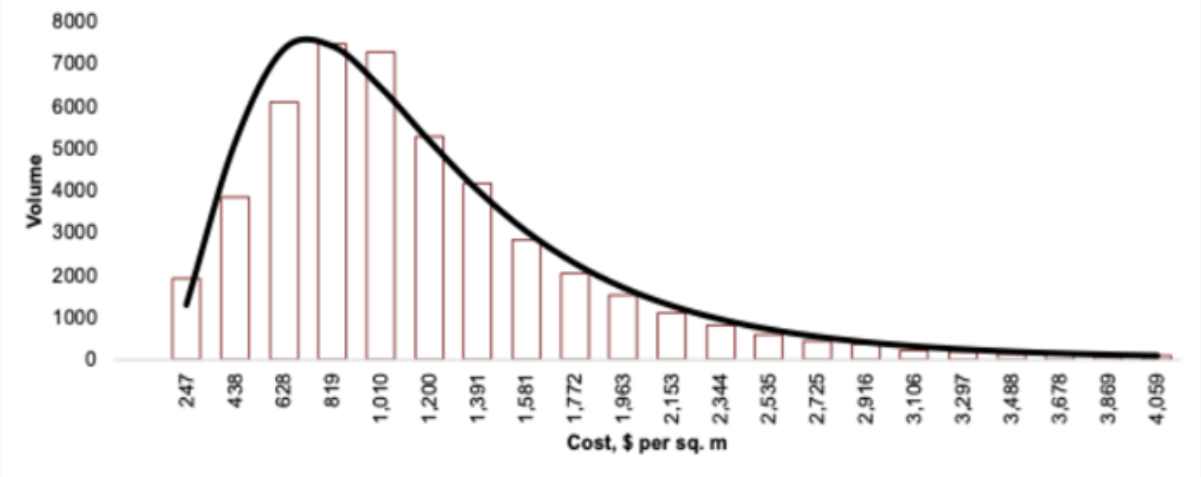

Figure 4. Volume of the secondary apartment market in Ukraine as of June 2025
Source(s): Author's own creation based on data from VERITEX (2025).

Pearson's criteria of statistical fitness showed best compliance of secondary market apartments offerings across Ukraine as a whole with lognormal distribution law (Fig. 5). Same outcomes have been proven for all regional statistical distribution if residential property markets within the country.

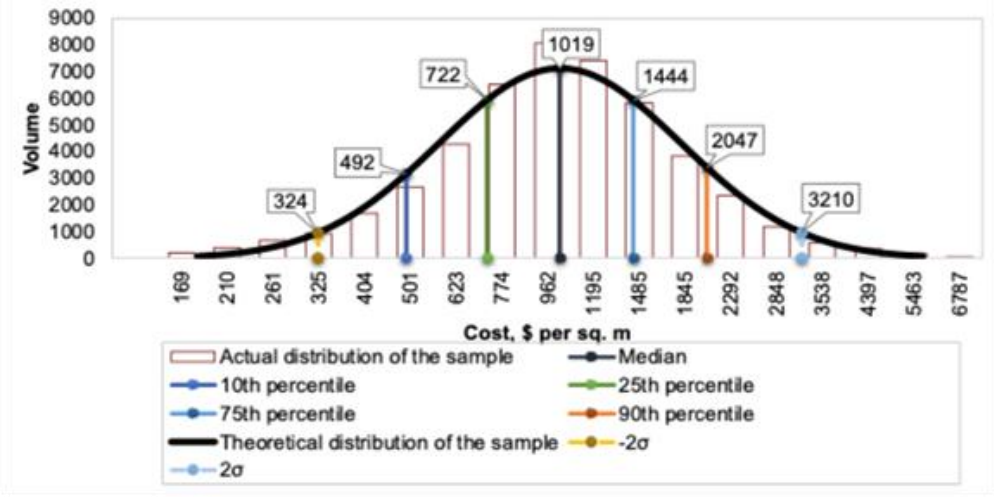

Figure 5. Description of the density of distribution of the cost of 1 sq. m. of apartments in the secondary market of Ukraine as of June 2025 by the log-normal distribution law.
Source(s): Author's own creation based on data from VERITEX (2025).

Based on that and for the convenience of further real estate market data processing, the statistical samples were converted by the decimal logarithm. The values of the cost per square meter and other statistical metrics were obtained by the inverse logarithm method applied to aggregated values.

The summary table of distribution parameters for this indicator, including all regional centers, contains not only the mean and median values but also the level of their dispersion and variation, providing a complete description of the probabilistic and statistical parameters of these distributions (Annex A). In particular, this table provides data for values "mean plus and minus 2σ," corresponding to the limits of 95.46% of the corresponding distribution.

A comparison of median housing prices between 2019 and 2025 reveals substantial regional differentiation. The most pronounced growth occurred in the western regions: in Lviv, the median price nearly doubled, driven by significant migration inflows and the concentration of demand in relatively safe areas. A similar dynamic was observed in Lutsk, Ivano-Frankivsk, and Uzhhorod, where increases of 70–90% confirm the persistent westward shift of demand.

The long-term trajectory confirms the emergence of a clear spatial polarization: western and central regions demonstrate significant appreciation in housing values, while eastern and southern territories are characterized by persistent depreciation, directly reflecting the impact of warfare and migration processes.

In general, the median cost of apartments in the country is 1019 USD/sq. m, so we can observe significant differences in both the levels of average cost for different regions and the degree of their volatility with opposite regional markets evolution tendencies (Annex A). At the same time, obtaining only averaged cost indicators for each city is not sufficient, considering the geographic zoning and differentiation of cost indicators within the city.

A defining feature of military actions from 2022 has been the stark of regional disparity driven by the conflict. Cities and regions in western and central Ukraine, considered relatively safe, saw strong demand and price growth, while war-affected east and south regions suffered declines. In 2024, many western cities posted double-digit price gains, in particular Lviv and Lutsk regions saw +25–30% YoY growth in median prices. By contrast, frontline areas saw falling prices (Kharkiv – minus 14%, Zaporizhzhia – minus 16%). Overall, relatively safer western/central regions now command the highest and fastest-rising prices, while eastern/southern regions have the lowest, cheapest, and most rapidly depreciating values.

Analysis of key market volatility parameters dynamics such as dispersion and coefficient of variation, across the Ukrainian housing market during 2019–2025 reveals both long-term structural shifts and pronounced seasonal effects (Fig. 6). In 2019, the market was characterized by relative stability, while the COVID-19 pandemic in 2020 triggered a short-term increase in volatility. A partial

recovery followed in 2021, but the onset of the full-scale war in early 2022 led to a sharp spike in both dispersion and the coefficient of variation, reflecting heightened uncertainty and market disruption.

From 2023 onwards, both indicators gradually declined, indicating partial stabilization and the smoothing of extreme values. Seasonal effects are clearly visible: during the winter months, dispersion typically increased due to lower transaction volumes and greater heterogeneity of listings, whereas in spring and early summer the price range narrowed and market predictability improved.

By mid-2025, dispersion levels had fallen compared to the wartime peak of 2022, while the coefficient of variation remained relatively stable. This suggests a gradual recovery of market predictability, although the overall level of risk remains elevated.

Buyers' priorities have shifted with the war. Features that enhance safety and self-sufficiency (ground-floor units with easy shelter access, autonomous heating or generators, built-in bomb shelters) now significantly boost a property's value. In practice, this means newer, well-equipped "move-in ready" apartments in safer locations are in higher demand than inexpensive, fixer-upper units.

Based on the 2019–2025 results, the Ukrainian housing market demonstrates how successive systemic shocks have reshaped both price dynamics and volatility. The COVID-19 pandemic in 2020 caused only a temporary contraction in activity and a short-term increase in volatility, followed by a brief rebound in 2021. However, the full-scale Russian invasion in early 2022 proved to be the dominant shock, with volatility metrics (dispersion and coefficient of variation) spiking far more persistently than during COVID-19, highlighting the structural fragility of the market

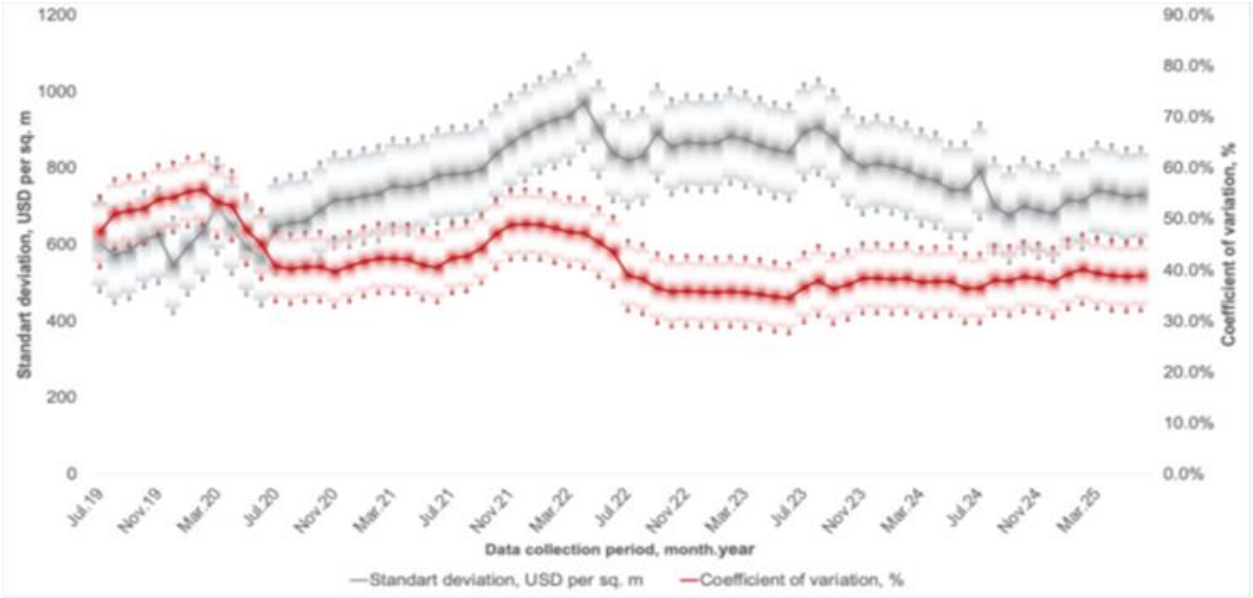

Figure 6. Dynamics of dispersion and coefficient of variation of the cost of 1 sq. m. in the secondary housing market in Ukraine as of June 2025.
Source(s): Author's own creation based on data from VERITEX 2025).

Transaction volumes collapsed, regional polarization intensified, and uncertainty remained elevated well into 2023. From 2024 onwards, partial stabilization has been observed, yet the recovery remains fragile and uneven, with western and central regions showing resilience and growth, while eastern and southern markets continue to face structural decline. These findings confirm that both the pandemic and the war acted as critical turning points, but the war fundamentally altered the trajectory of Ukraine's housing market, underscoring the importance of volatility metrics as indicators of resilience under crisis conditions.

Overall, despite the challenges, recent years show signs of stabilization. By mid-2025, transaction volumes were returning toward pre-war levels. The recovery remains fragile and closely

tied to the security situation: each flare-up of hostilities briefly halts sales, while relative calm encourages a surge in listings and deals. In this analysis we use VERITEX's proprietary database of roughly 2.66 million apartment offers (collected nationwide by mid-2025) to ensure accuracy. This high-quality data underpins the above overview and confirms that, despite volatility, Ukraine's housing market has begun to adapt and recover under the new wartime conditions.

Overview of the British residential property market evolution. The United Kingdom's residential property market between 2005 and mid-2025 exhibited long-run upward momentum punctuated by several pronounced shocks and subsequent recoveries. The market's recent evolution reflects the cumulative influence of the global financial crisis, Brexit, the COVID-19 pandemic and, more recently, indirect effects of the war in Ukraine via macroeconomic channels (inflation, interest rates, investor sentiment) [1]. Transactional activity and price dynamics display clear cyclical behaviour: sharp falls in 2008 were followed by a protracted recovery to 2014–2019, a pandemic-era spike in 2021–2022, and a partial correction as affordability tightened from mid-2022 into 2024 before a tentative stabilization into 2025 [10], [17].

Annual sales volumes (Fig. 7) have experienced large swings: transactions fell from peaks of approximately 1.5 million (2006) to under 750,000 in 2008, recovered above one million in 2013–2014, declined again around 2018–2019, then fell 16% in 2020 before rebounding 51% in 2021. Subsequent affordability pressures produced a 17% fall in 2022 and a further 25% fall in 2023 with a modest recovery in 2024 followed by preliminary contraction in early 2025 [9]. These movements underscore the sensitivity of UK market turnover to macro shocks and financing conditions.

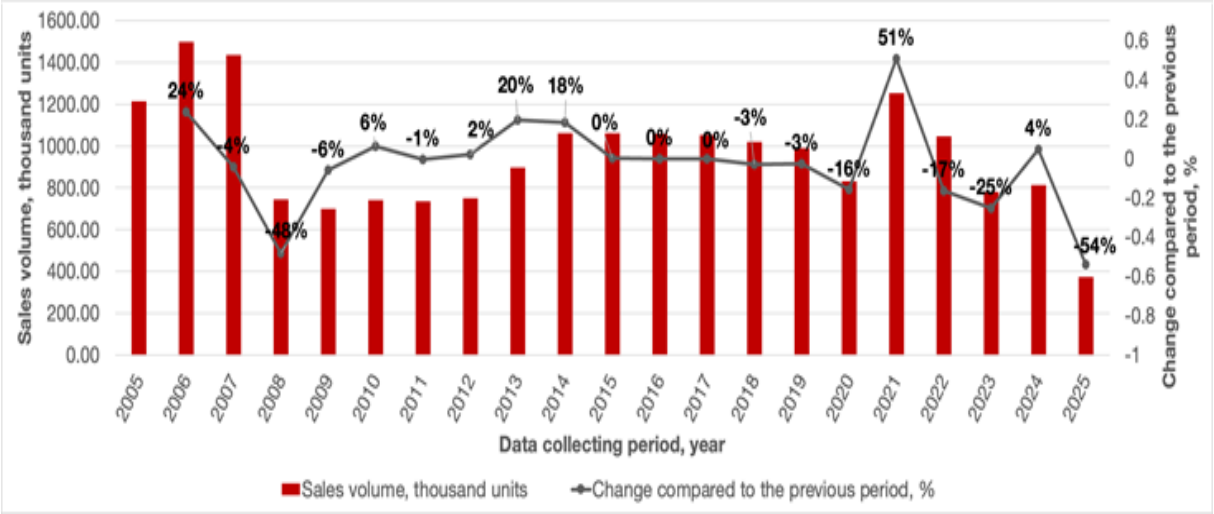

Figure 7. Evolution of sales volume on the real estate market in UK, 2005-2025, thousand units (Annually). Source(s): author's own creation based on data from House Price Statistics (2025).

Over the two-decade span, average prices per m² and median house values rose substantially, although the path was non-linear (Fig. 8). The pandemic encouraged a strong price surge (notably between June 2021 and June 2022), while rising interest rates from mid-2022 precipitated a modest market pullback (-2.5% to -5% across some segments), and a restrained rebound appeared in late-2024/early-2025 [1]. By April-May 2025, annual house-price growth had been moderated with the UK average Y-o-Y growth 3.5%.

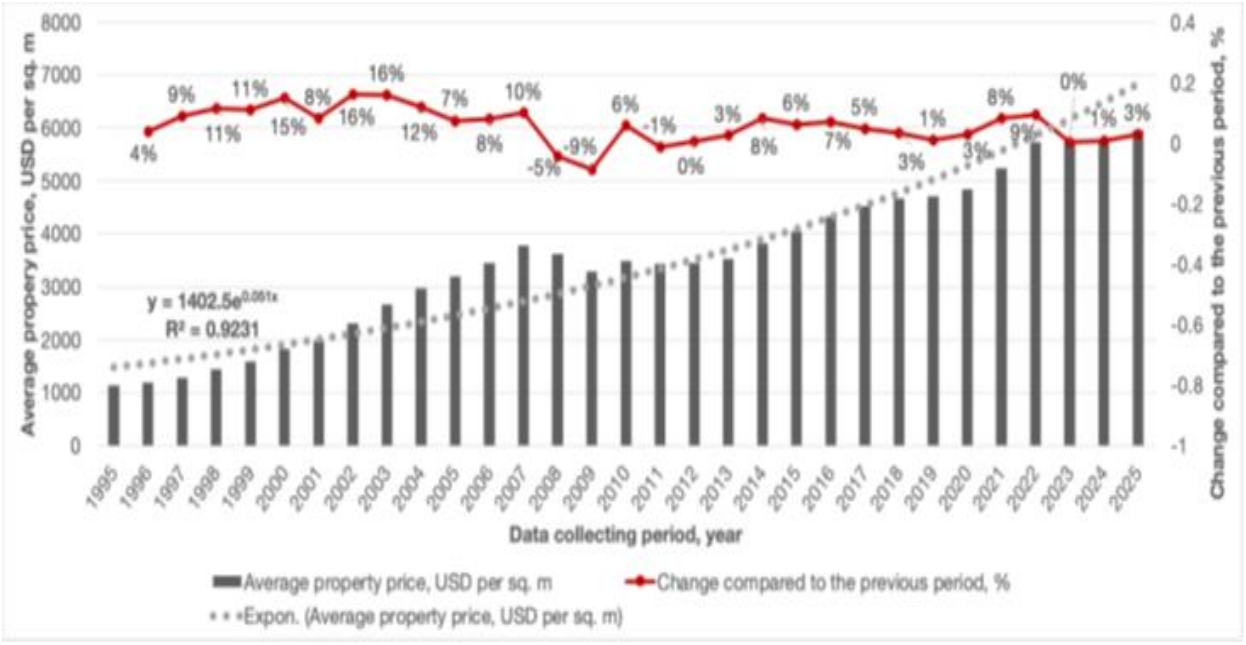

Figure 8. Evolution of average property price in UK, 1995-2024, USD/sq. m
Source(s): author's own creation based on data from House Price Statistics (2025).

The analysis of average housing price dynamics in the United Kingdom during 2010–2025 demonstrates a steady upward trend across all four constituent parts of the country: England, Wales, Scotland, and Northern Ireland. A clear and persistent hierarchy of price levels is evident: England consistently maintains the highest average values, while Northern Ireland remains at the lowest end of the spectrum. Scotland and Wales occupy intermediate positions, though their trajectories also reflect gradual increases in the cost per square meter.

The process of regional polarization has not diminished over time but rather gradually intensified. This highlights structural differences in housing market development across the United Kingdom.

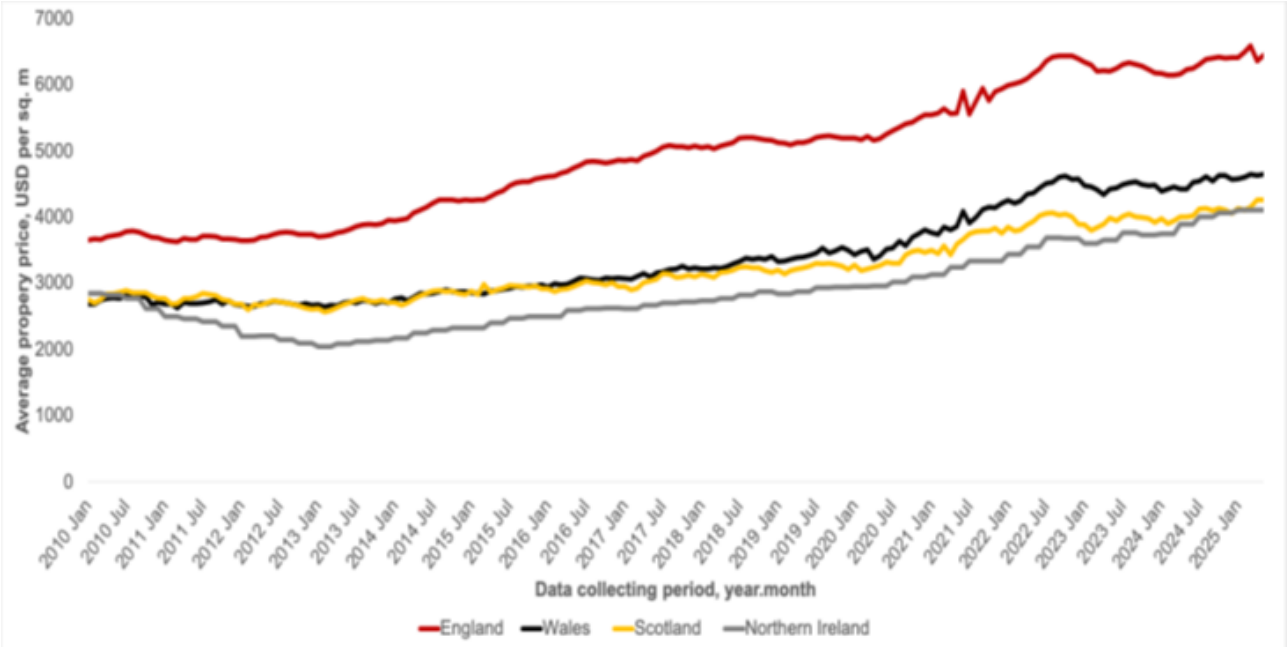

Figure 9. Average house price in the UK, by county, GBP/sq. m. Source(s): author's own creation based on data from House Price Statistics (2025).

Statistical analysis of the total amount of available primary information after its initial filtering based on the Romanovsky criterion for statistical "outliers" shows the same pattern as in case of Ukrainian residential market being not symmetrical with pronounced positive (right-sided) asymmetry (Fig. 10).

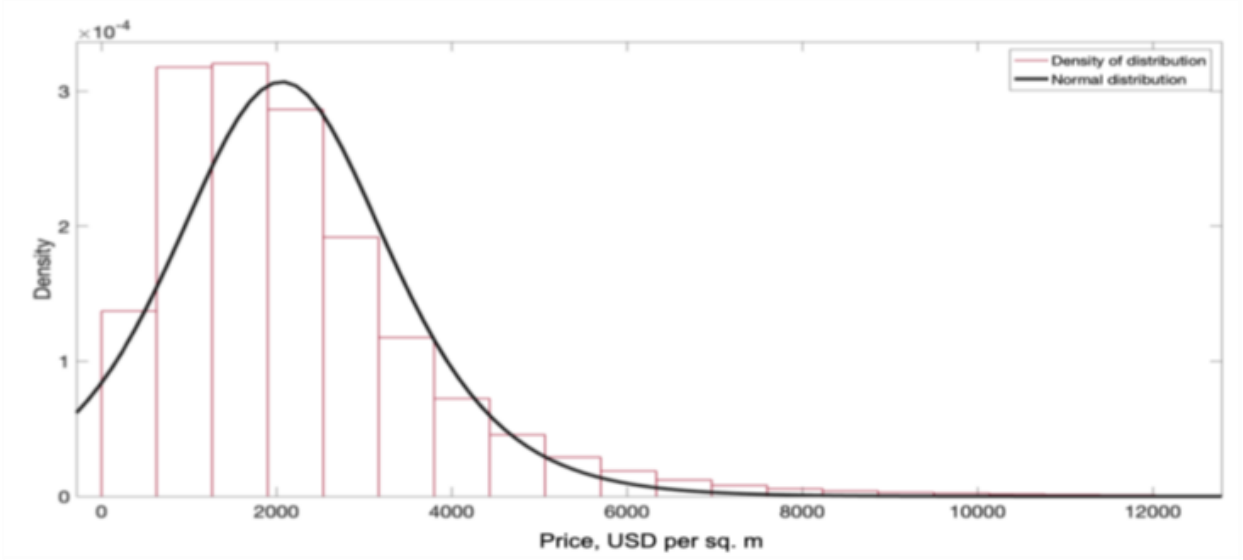

Figure 10. Density of distribution of the property prices in the market of the UK as of May 2025.

Source(s): author's own creation based on data from London Datastore (2025).

The density distributions of the property prices in the market across the UK as a whole and in the regions as of May 2025, when approximated by a lognormal distribution law same like in case of Ukrainian property market demonstrated more convenient for processing pattern with compliance proven by Pearson χ^2 criterion (Fig. 11).

Same results have been received for British residential property market for key regions around of country. It opened the possibility to implement the same methodological procedure for initial data sets processing with further direct comparison of results gained for these two different markets.

Thus, all further processing of the primary information database is based on determining the parameters of the log-normal distribution law adopted as the theoretical law for the entire general population of the information database on the distribution of the cost per square meter of living space. The evolution of volatility measures reveals clear cyclical patterns: dispersion increased sharply during systemic shocks such as the 2008 global financial crisis, narrowed considerably during the more stable expansionary phase around the Brexit period (2016–2019), and remained relatively low through the COVID-19 years (2020–2021).

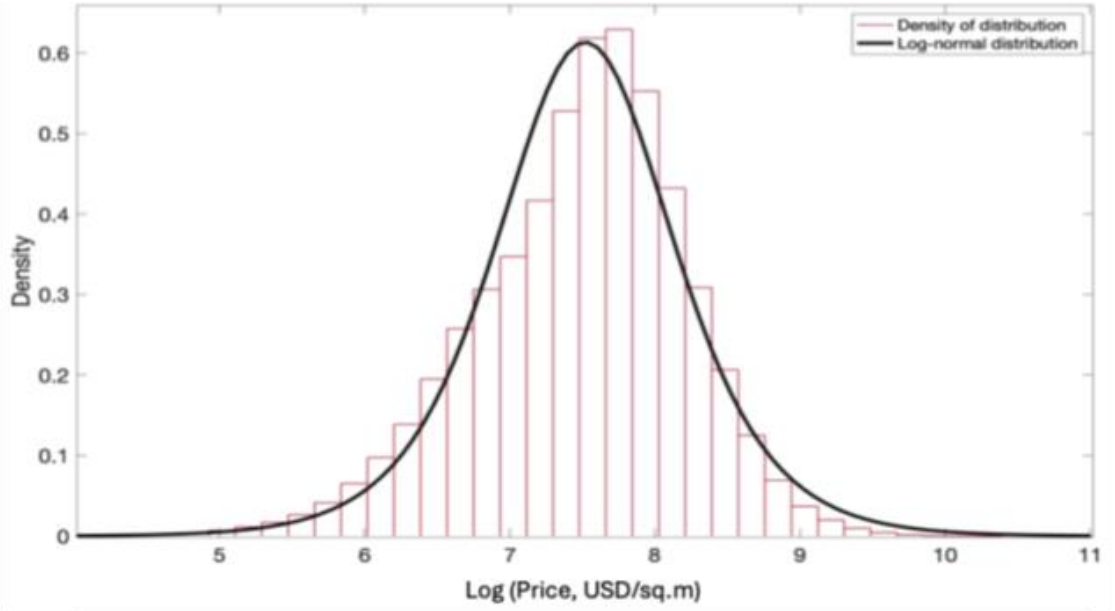

Figure 11. Description of the density of distribution property prices in the market of the UK as of May 2025 by the log-normal distribution law. Source(s): author's own creation based on data from London Datastore (2025).

However, volatility became more heterogeneous again in 2022–2023 as interest-rate shocks and affordability constraints reshaped market dynamics (Annex B). Regional differences are pronounced: Northern Ireland consistently exhibits the highest relative volatility, with coefficients of variation well above national averages, while Yorkshire & Humber and the North East also show elevated volatility in recent years. By contrast, regions such as the South East and East of England display lower relative dispersion, underscoring their comparatively stable market profiles. These patterns highlight the importance of region-specific analysis when assessing risk and predictability in the UK housing market.

By examining the dispersion of prices and the coefficient of variation pattern, we can gain a clearer understanding of the market's predictability and stability during these periods (Fig. 12).

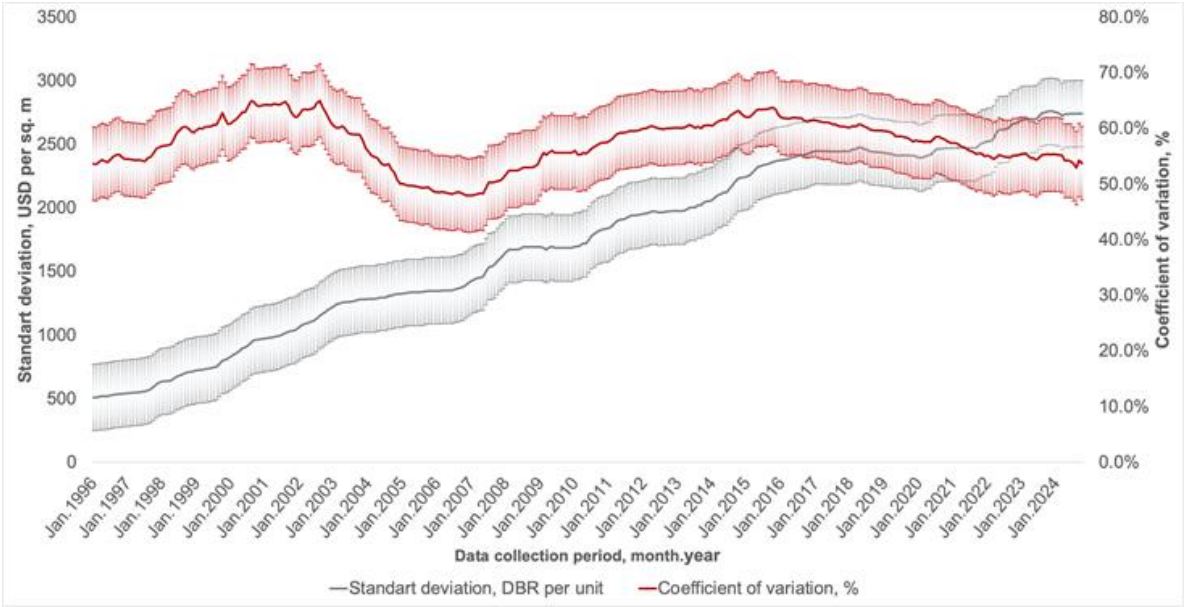

Figure 12. Dynamics of dispersion and coefficient of variation of the property prices in the market of the UK as of May 2025. Source(s): author's own creation based on data from House Price Statistics (2025).

In 2022, UK property prices experienced significant fluctuations in both the dispersion of prices (the spread of prices around the average) and the coefficient of variation (a measure of relative dispersion) compared to previous years. This indicates a less predictable market with a broader range of prices being offered. In 2023, market stability improved compared to 2022. Property price fluctuations were less pronounced, suggesting a more stable market environment.

Data in Annex B and Figure 12 indicate that each of the shock factors considered (the global financial crisis of 2008, Brexit instability from 2016 to 2019, the COVID-19 pandemic of 2020–2021, and the shock of rapid interest rate hikes in 2022–2023) in the UK real estate market led to sharp spikes in price dispersion and increases in the coefficient of variation (CV). For example, during the 2008–2009 crisis, the UK real estate market clearly saw a significantly larger price range and CV, whereas during the "calm" Brexit years (2016–2019) both measures remained markedly lower.

Price dispersion is much more sensitive to turbulence than the mean or median value. Owing to the log-normal price distribution with a pronounced right tail (Fig. 10, 11), even minor shifts in the premium segments stretch the distribution's tail and substantially widen overall dispersion. Thus, analysis of the dynamics of dispersion and CV (Fig. 12) enables clear identification of phases of tension and stabilization: the local maxima of these indicators coincide with crisis spikes, while their declines coincide with periods of relative market calm.

Even amid overall stability, isolated peaks in dispersion can signal hidden risks or market asymmetries: for example, a temporary increase in the number of expensive transactions extends the right tail of the log-normal price distribution (Fig. 10) and triggers a brief spike in dispersion.

While there was a general trend towards greater stability in 2023, regional variations likely existed across the UK. Analysing these regional differences can provide a more nuanced understanding of the property market's behavior and highlight areas with distinct trends.

Supply volume varies considerably across regions, with the South East of England and London having the highest volume and Northern Ireland having a relatively lower volume (Fig. 13). Median price follows a similar pattern as supply volume, with London boasting the highest median price. Coefficient of variation as a measure of relative dispersion is generally lower for regions with higher median prices, suggesting a lower spread around the median in these regions. The lower and upper bounds of the confidence interval provide an estimate of the range within which the true population mean falls with a 95% confidence level.

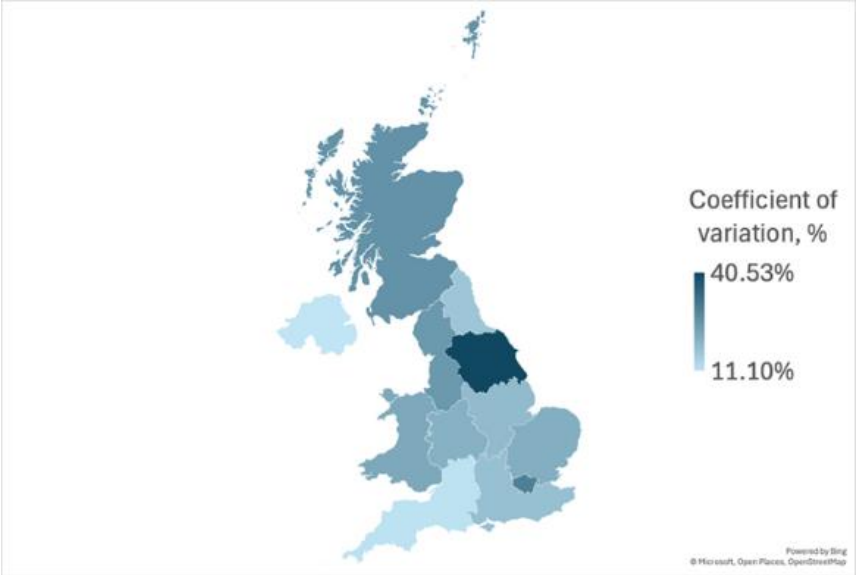

Figure 13. Coefficient of variation of the property prices in the market of the UK across the regions as of May 2025, %. Source(s): author's own creation based on data from UK Government (2025).

Building on the insights from the Annex B, the graph (fig. 13) takes a visual approach to understanding the coefficient of variation for housing prices across UK regions. The chart suggests that there is a significant variation in housing prices across different regions of the United Kingdom. Yorkshire and the Humber has the highest coefficient of variation at 40.53%, while Northern Ireland has the lowest coefficient of variation at 11.10%. This means that housing prices in Yorkshire and the Humber have the most significant spread around the average compared to the other regions [20].

Property-type segmentation evidences divergent dynamics: detached properties consistently command the highest prices per m^2, with semi-detached and terraced homes following; flats and maisonettes have shown the smallest cumulative increases over the multi-decadal sample. New-builds tend to exhibit steeper appreciation paths than existing stock, although both series track common boom-and-bust episodes. These structural differences have implications for volatility and investor risk (semi-detached homes show relatively lower volatility, terraced houses large cumulative gains but higher cyclicality) [21].

A persistent shortage of available new stock constrains affordability and underpins longer-term price resilience in high-demand areas. England's housing stock is ageing with large cohort built before 1919 and abundant post-war stock, placing upward pressure on maintenance and retrofit investment needs and distinguishing the capital and high-demand regions from more affordable devolved nations [21].

By mid-2025 the UK residential market appears to be in a phase of moderated growth and selective recovery: prices have largely stabilized following the mid-2022 to early-2024 rate shock, transaction volumes display ongoing sensitivity to financing conditions, and regional dispersion measures reveal differentiated recovery paths. The empirical regularities (log-normal price law, regionally varying CVs, property-type heterogeneity) provide a statistically coherent framework for comparative assessment against the Ukrainian market and for assessing market resilience to future macro shocks.

Overall, between 2005 and 2025, the UK housing market has repeatedly demonstrated its cyclical resilience to systemic shocks. The global financial crisis of 2008, Brexit-related uncertainty, the COVID-19 pandemic, and the 2022–2023 interest-rate tightening all produced visible spikes in volatility metrics, with dispersion and coefficients of variation widening during these episodes. Yet, unlike Ukraine, these shocks were followed by relatively rapid narrowing of volatility, reflecting the maturity of institutions, the depth of financial markets, and the stabilizing role of monetary and fiscal policy. Regional heterogeneity remains pronounced: Northern Ireland and northern regions exhibit higher relative volatility, while the South East and East of England display lower dispersion and greater predictability. By mid-2025, volatility measures had moderated compared to earlier peaks, suggesting that the UK market, while sensitive to macroeconomic shocks, retains a strong capacity for cyclical adjustment. This pattern underscores that in the British case, volatility metrics capture temporary stress episodes rather than structural fragility, highlighting the contrast with Ukraine's more persistent wartime volatility.

Comparative Analysis. Both markets exhibit positively skewed price distributions with heavy upper tails. This implies that mean prices exceed medians and a few high-end transactions inflate averages. Empirical studies note that house-price tails are "much fatter" than a lognormal benchmark (Ohnishi et al., 2011), reflecting power-law-like extremes rather than pure Gaussian behaviour.

In practice, Ukraine's market shows especially high dispersion: large regional heterogeneity and unstable macro conditions have driven its price coefficient of variation (CV) above that of the UK. By contrast, the UK, with more uniform market institutions, has a lower CV, indicating tighter clustering around the mean. In each country, log-transforming prices tends to produce a more symmetric (nearly normal) distribution in tranquil periods (Ohnishi et al., 2011), consistent with the idea that size-adjusted prices follow an approximate lognormal law outside crisis episodes. However, extreme shocks (e.g., bubbles or war-induced distortions) generate fat tails.

In both markets, the distribution of prices is right-skewed and well-modelled by a log-normal law. This means medians lie below means due to high-end outliers and variation coefficients are

moderate. For instance, Ukraine's coefficients of variation by city centre range roughly 0.14–0.21, while UK high-price regions like London exhibit high medians but comparatively lower relative dispersion.

Ukraine's housing prices have a higher relative volatility (higher CV and skewness) than the UK's, reflecting more heterogeneous submarkets, while both exhibit the classic right-skewed, long-tail shape common in real estate.

In the UK, London remains the priciest submarket with nearly twice the national mean but its price growth has lagged all regions. By Q1 2025, London's annual increase was only 1.9%, compared to 3-6% in most other regions, and even double-digit gains (13.5%) in Northern Ireland (Global Property Guide, 2025a). This reflects a post-crisis recalibration: peripheral and northern areas are catching up while London's affordability ceiling constrains its growth.

Population flows reinforce these trends. Ukraine's crisis led to the internal migration (IDPs) from east/south to west/centre, putting upward pressure on housing demand and rents in safe cities. In the UK, a pandemic-induced "urban exodus" reversed by 2025: coastal and rural markets outperformed during COVID as Londoners sought space, but recent data show London's appeal is returning again the most searched location, with the majority of its residents choosing to stay (Jones, 2025).

Thus, both countries exhibit pronounced centre–periphery and regional splits, with migration patterns reinforcing these polarizations. Ukraine's relatively "safe" western/central cities saw 2024 apartment price growth of +10-30%, whereas eastern/southern (war-zone) regions saw falls. Similarly, UK housing costs are much higher in London/South East than in Northern or devolved regions.

According to [21], the two markets differ in housing stock and buyer behavior. Property characteristics strongly affect prices. In both markets the number of rooms (and thus apartment size) correlates with cost. Ukraine's analysis shows larger apartments carry higher total prices but varied per-m² rates. For example, in high-rise buildings, the median per-m² price jumps from about 1,224 USD per sq. m for 1-room flats to 1,973 USD per sq. m for 5-room flats. In the UK, similarly, more rooms correlate to a larger property size, which often equates to a higher price.

Total floor area also matters but in a different way: British data indicate per-m² prices are flat for flats up to roughly 110 m², and only above 110 m² do prices rise steeply (reflecting scarcity of very large flats). In Ukraine, even among one-bedroom apartments, larger units with a bigger living space actually fetched higher per-m² prices, indicating no simple economy-of-scale in that segment. Floor level is another factor in Ukraine: apartments on mid-levels have the highest average prices, while ground-floor units go for 10–35% less (especially in tall buildings) and top floors are also modestly discounted.

Renovation and condition produce large price swings in Ukraine. Luxury finishes ("author's project") command a 50–56% premium in price per m² over the base category, whereas apartments with only cosmetic repairs sell for roughly 20–34% below average. By contrast, UK data compare new-build versus existing homes: existing often older properties on average sell at higher prices than new builds, though new homes have experienced faster price growth recently. This suggests UK buyers also pay for finished condition and location of existing stock. In England, for instance, the majority of owner-occupied housing was built before 1919, implying widespread age/condition effects on value [21].

In sum, Ukrainian demand remains constrained by conflict with buyers and sellers being cautious in exposed areas and buoyed in stable zones, whereas UK demand is driven by policy cycles (tax reliefs, interest rates) and by lifestyle shifts that briefly altered housing preferences (Global Property Guide, 2025a, b).

Macroeconomic shocks have shaped each market differently. In Ukraine, the 2022 full-scale war is the defining shock. Transaction volumes fell to only 70–75% of their pre-war levels in 2024. Even so, government measures and pent-up demand led to price stability: on a nominal basis 2024–2025 prices returned close to early-2022 levels. Most strikingly, the war has reweighted demand: massive population inflows to western/central regions have pushed prices up there, whereas prices and sales

in eastern front-line areas have collapsed. Secondary shocks (e.g. COVID-19) had only a muted impact compared to the war.

By contrast, in the UK, the 2008 financial crisis, 2016 Brexit uncertainty, the 2020 COVID-19 crash, and the recent surge in interest rates all left marks. The pandemic (2020) caused a brief lockdown-driven decline, but ultra-low rates and fiscal stimuli, e.g. a stamp duty holiday triggered a 2021 boom of nearly +10% annual price growth. This boom concentrated in suburbs/rural areas. After 2022, high inflation and rapid Bank of England rate hikes cooled activity: 2023 saw negative price growth and a 31.7% drop in mortgage approvals. By 2024–25 the market began stabilizing (prices up 3–4% annually), despite these headwinds [6].

In summary, both markets show clear evidence of event-driven volatility: major crises (2008, pandemic, war) coincide with spikes in price dispersion, and both conclude that price distributions remain highly asymmetric (log-normal) under these shocks. However, both markets exhibit resilience: each bounced back after initial shocks. Ukraine's market gradually recovered some ground despite the war, and the UK rebounded after COVID-induced volatility. However, Ukraine's recovery is fragile and localized by the war's geography, whereas the UK's has been broadly supported by policy and returning demand. Transaction volumes similarly show this contrast: Ukraine's remain depressed by geopolitical risk, while UK volumes have been lifted by policy interventions, e.g. pre-tax-change rush despite interest-rate headwinds [6], [7].

In Great Britain, historical crisis events caused only short-lived spikes in housing market volatility. Specifically, during the global financial crisis of 2008–2009, regional price differences temporarily leveled off – the coefficient of variation (CV) across regions even slightly decreased (from 0.44 to 0.42). Subsequently, with the stabilization of the economy, the CV gradually increased: by early 2016 it reached a record 0.68, reflecting varying rates of recovery (London and the South recovered faster than the North and Wales). However, even these fluctuations were short-lived, as well-developed market institutions and flexible monetary policy promptly smoothed out the imbalances.

By contrast, in Ukraine the effects of systemic shocks have been more persistent and uneven. Only the COVID-19 pandemic in 2020 caused a slight slowdown in price growth, and by the end of that year the market had largely adapted. However, the full-scale war of 2022–2025 dramatically increased dispersion: in the more secure western regions prices surged, while in the frontline regions they fell or remained at minimal levels. The war led to a radical "territorial polarization": as analysts note, a situation emerged of an "expensive West and cheap East." As a result, the average price may remain moderately high, but the CV explicitly reveals deep structural strain and unevenness — since the difference between the so-called "rescue" regions and the war zones has become extraordinarily large.

Table 1. Parameters of distributions of the cost per square meter of secondary market apartments in regional centers of Ukraine as of June 2025

Shock Event (Period)	Country	Market Volume Δ (%)	Average Price Δ (%)	Volatility (CV) Δ (p.p.)*
GFC (2007–2009)	UK	–48% to –50%	–15% to –20%	+5% to +10%
	Ukraine	N/A*	N/A*	N/A*
Brexit (2016–2019)	UK	–3% to –5%	+1% to +3%	–1% to 0%
	Ukraine	N/A*	N/A*	N/A*
COVID-19 (2020)	UK	-16%	+10%	0% to +1%
	Ukraine	–20% to –25%	–5% to 0%	+2% to +3%
War / Rates (2022–2024)	UK	–17% to –25%	–2.5% to –5%	+2% to +5%
	Ukraine	–50% to –70%	–16% to +30%*	+10% to +20%

*Note: CV Δ (p.p.) denotes the absolute change in the Coefficient of Variation in percentage points (e.g., from 5% to 10% is +5 p.p.). Ukraine 2022–2024 Price Δ reflects extreme regional polarization: –16% in frontline regions (e.g., Kharkiv) vs +30% in western regions (e.g., Lviv).

N/A: Data for Ukraine prior to 2019 is outside the scope of the processed dataset.

In general, the coefficient of variation has proven to be a more informative indicator of market turbulence than average or median prices. The CV is defined as the ratio of the standard deviation to the mean, making it dimensionless and allowing the degree of price dispersion to be compared over time and across countries. For example, a market might show moderate growth in the average price, even though small players were actually hit much harder – the CV immediately reveals this imbalance, whereas the mean value may "smooth over" such differences. A high CV signals asynchronous price changes (a highly uneven shock impact), while a low CV indicates more synchronized, stable growth. This conclusion is important for analyzing market resilience: the higher the dispersion and the CV during a crisis, the more structural breaks the market experiences, and the lower its resilience appears. Therefore, unlike average indicators, the CV allows one to uncover the true turbulence and recovery mechanisms of the market in both countries (Table I).

Table I illustrates the asymmetric impact of macroeconomic and geopolitical shocks on housing markets in the UK and Ukraine. The Global Financial Crisis (GFC) triggered steep transaction and price declines in the UK (-50% in volume, -15-20% in prices), with volatility increasing by up to 10 percentage points. In contrast, Brexit had minimal impact on price levels and volatility. COVID-19 produced moderate volume reductions but mild or even positive price changes in both countries. The most profound disruption came during the 2022-2024 war: in Ukraine, market activity collapsed by up to 70%, with price divergence across regions from -16% to +30% and CV rising as much as +20 p.p. The UK also experienced contraction from interest rate shocks, though with far smaller effects.

7. Prospects for further research development

Comparative analysis provided emphasizes particulars of residential property markets evolution in two contrasting economies under the influence of several disruptive factors. For the United Kingdom these factors are GFC 2007/2009, Brexit and COVID-2019 pandemic, when for Ukraine it includes wartime period from 2022 and COVID-2019 period of unrest. To certain extent it compensate existing gap in a unified, high-quality data analytics that captures transaction-level detail, pricing structures, and regional variation.

In this regard, it should be considered as useful information guiding on the quantitative results of residential property markets' evolution in different types of economies, especially addressing the market's volatility parameters changes during and after the periods of extreme turbulence induced by general shocks.

With the scope of the initial data sets collected and processed based on the developed unified statistical algorithm, the analyses provided is based on two exemplified economies, including the United Kingdom and Ukraine. In this sense, it would be reasonable to extend the application of the methodology developed to include other markets and economies to arrive to more general outcomes and conclusions.

8. Conclusions

Methodologically, this analysis demonstrates the value of probabilistic-statistical approaches under asymmetric information. Fitting log-normal models to size-adjusted prices provides a meaningful baseline for both markets. This is line with findings in [18], which revealed that price dispersion is near-lognormal in homogeneous sub-markets. This supports our use of log transforms and local variance measures. By modelling each region or typology separately and filtering outliers, we succeeded to reduce noise from heterogeneous segments. For example, where large external shocks produce fat tails, excluding outliers sharpens the underlying trends. Similarly, computing CV rather than raw standard deviation yields a scale-invariant measure of volatility, making cross-country and cross-period comparison tractable even as average price levels differ greatly. These techniques mitigate biases from incomplete reporting and asymmetric information.

In sum, our approach extends the existing literature by applying log-normal fitting, CV analysis, and outlier filtering to two very different contexts. The results suggest that these tools capture the core price dynamics effectively and can be widely applied in turbulent markets to improve index construction and forecast reliability.

The data confirm that large-scale crises such as the GFC and the war in Ukraine have disproportionately affected housing markets, with Ukraine exhibiting far greater fragility. Regional polarization under war conditions amplified volatility more than any prior event. Coefficient of variation proved a sensitive indicator of underlying instability, rising sharply in Ukraine. While both countries experienced volume and price shifts under pressure, the UK market's volatility normalized faster, signaling greater resilience and structural maturity.

The statistical patterns identified have practical forecasting implications. For investment planning, high CV values signal greater uncertainty in predicted prices. Thus risk-adjusted models should use wider confidence bounds in Ukraine than in the UK. In particular, the pronounced right-skewness (fat upper tail) means standard forecasting models that assume normality will understate the likelihood of extreme price moves.

Common resilience patterns, such as rapid post-shock rebounds, offer useful guidance: for instance, both markets recovered notably after COVID troughs, suggesting that shocks may have temporary effects if mitigating policies are strong. The asymmetric dispersion metrics may also aid scenario planning: for example, if Ukraine's CV spikes as seen during the war, forecasters can interpret that as a signal of market segmentation and adapt by focusing on more liquid submarkets.

In practice, our results encourage using probabilistic simulations that reflect the empirical dispersion and skewness, rather than relying solely on point forecasts. Recognizing the log-normal tendency of prices (outside crisis periods) also helps in projecting medians and managing tail risk.

9. Acknowledgements

The final stage of this paper preparation has been fulfilled with the kind support of the Leicester University School of Business, UK under the British Academy funded project "Researchers at Risk". The appearance of presented below the comparative results on Ukrainian and British residential property market evolution in recent stormy years and their public availability certainly could not be happened without such valuable support.

Annex A

Table. Parameters of distributions of the cost per square meter of secondary market apartments in regional centers of Ukraine as of June 2025

Region	Amount of offers	Median (μ)	Average	S lg(σ)	Coefficient of variation	Lower confidence limit interval (-2σ)	Upper confidence limit interval (+2σ)
Kyiv	16034	3.20	1855.21	3.22	0.21	0.33	599.74
Odessa	7175	3.00	1152.79	3.02	0.18	0.28	444.01
Kharkiv	5237	2.86	785.88	2.86	0.17	0.27	324.05
Dnipro	3174	2.92	937.53	2.94	0.17	0.26	388.39
Lviv	2740	3.20	1685.52	3.20	0.14	0.22	818.78
Ivano-Frankivsk	2490	2.97	1040.84	2.99	0.14	0.22	481.19
Zaporizhzhia	1516	2.69	525.99	2.70	0.14	0.22	252.97
Khmelnytskyi	1253	2.96	944.85	2.96	0.11	0.17	545.95
Mykolaiv	1229	2.77	630.68	2.78	0.13	0.21	318.54
Vinnytsia	1154	3.07	1225.40	3.07	0.11	0.17	700.82
Uzhhorod	1047	3.19	1574.45	3.17	0.14	0.22	796.65
Ternopil	869	3.00	1008.32	2.99	0.10	0.16	616.92
Rivne	859	3.06	1189.11	3.06	0.12	0.18	662.73
Poltava	846	2.94	936.18	2.95	0.13	0.20	474.87
Chernihiv	674	2.90	866.79	2.92	0.14	0.21	429.87
Chernivtsi	594	3.02	1154.46	3.04	0.14	0.22	550.62
Cherkasy	573	2.98	1047.37	3.00	0.14	0.21	510.07
Zhytomyr	570	3.02	1120.43	3.03	0.13	0.19	583.44
Sumy	501	2.76	610.13	2.77	0.13	0.19	321.78
Lutsk	482	3.04	1177.91	3.06	0.11	0.17	655.71
Kropyvnytskyi	407	2.90	833.74	2.91	0.11	0.17	471.17
Kherson	91	2.57	419.63	2.59	0.18	0.27	162.92

Annex B

Table. Volatility Measures for UK Regional Housing Markets (2008–2025)

Region	Period	Mean Price (USD/sq. m)	SD (USD/sq. m)	CV (%)
London	2008–2025	6,480	734	11.3
	2008–2009 (GFC)	5,010	489	9.8
	2016–2019 (Brexit)	7,142	332	4.6
	2020–2021 (COVID-19)	7,330	315	4.3
	2022–2023 (Interest Rate Shocks)	7,210	367	5.1
South East	2008–2025	3,990	370	9.3
	2008–2009 (GFC)	3,208	281	8.8
	2016–2019 (Brexit)	4,274	128	3
	2020–2021 (COVID-19)	4,480	166	3.7
	2022–2023 (Interest Rate Shocks)	4,480	152	3.4
East of England	2008–2025	3,405	258	7.6
	2008–2009 (GFC)	2,873	176	6.1
	2016–2019 (Brexit)	3,648	88	2.4
	2020–2021 (COVID-19)	3,944	98	2.5
	2022–2023 (Interest Rate Shocks)	4,020	125	3.1
South West	2008–2025	2,957	254	8.6
	2008–2009 (GFC)	2,344	201	8.6
	2016–2019 (Brexit)	3,364	91	2.7
	2020–2021 (COVID-19)	3,683	101	2.8
	2022–2023 (Interest Rate Shocks)	3,700	141	3.8
West Midlands	2008–2025	2,437	212	8.7
	2008–2009 (GFC)	1,981	178	9
	2016–2019 (Brexit)	2,649	71	2.7
	2020–2021 (COVID-19)	2,854	83	2.9
	2022–2023 (Interest Rate Shocks)	2,860	99	3.5
East Midlands	2008–2025	2,165	184	8.5
	2008–2009 (GFC)	1,786	132	7.4
	2016–2019 (Brexit)	2,391	57	2.4
	2020–2021 (COVID-19)	2,536	72	2.8
	2022–2023 (Interest Rate Shocks)	2,560	85	3.3
Yorkshire & Humber	2008–2025	1,910	185	9.7
	2008–2009 (GFC)	1,660	105	6.3
	2016–2019 (Brexit)	2,099	65	3.1
	2020–2021 (COVID-19)	2,180	79	3.6
	2022–2023 (Interest Rate Shocks)	2,210	117	5.3
North West	2008–2025	1,978	177	9
	2008–2009 (GFC)	1,655	133	8
	2016–2019 (Brexit)	2,180	72	3.3
	2020–2021 (COVID-19)	2,404	90	3.7
	2022–2023 (Interest Rate Shocks)	2,410	104	4.3
North East	2008–2025	1,570	148	9.4
	2008–2009 (GFC)	1,290	120	9.4
	2016–2019 (Brexit)	1,763	54	3.1
	2020–2021 (COVID-19)	1,908	69	3.6

References:

1) Bank of England. (2023, November). *Monetary Policy Report - November 2023*. bankofengland.co.uk

2) Bourassa, S. C., Hoesli, M., & Peng, V. S. (2003). Do housing submarkets really matter? *Journal of Housing Economics*, *12*(1), 12–28.

3) Brunet, C., & Füss, R. (2018). Regional housing markets and the determinants of house prices. *Journal of Real Estate Finance and Economics*, *56*(2), 1–29.

4) Case, K. E., & Shiller, R. J. (1989). The efficiency of the market for single-family homes. *American Economic Review*, *79*(1), 125–137.

5) Cedos. (2024). *Cedos annual report 2024*. cedos.org.ua

6) Global Property Guide. (2025a). *Subdued housing market activity in the UK*. globalpropertyguide.com

7) Global Property Guide. (2025b). *Ukraine's residential property market analysis 2025*. globalpropertyguide.com

8) Goodman, A. C., & Thibodeau, T. G. (1998). Housing market segmentation. *Journal of Housing Economics*, *7*(2), 121–143.

9) HM Land Registry. (2024, November 20). *UK House Price Index for September 2024*. GOV.UK. www.gov.uk

10) House Price Statistics. (2025). *UK House Price Index*. Data.gov.uk. data.gov.uk⟨=en

11) Hudson, E. (2018). Regional house price cycles and spatial dependence. *Urban Studies*, *55*(12), 2632–2650.

12) Jones, R. (2025, April 9). Pandemic-fuelled shift to coast and country has gone into reverse. *The Guardian*. theguardian.com

13) Leishman, C., Watkins, C., & Fraser, W. (2013). The impact of housing submarkets on the modelling of price dynamics. *Urban Studies*, *50*(6), 1201–1218.

14) London Datastore. (2025). *House price per square metre in England and Wales*. University College London (UCL). london.gov.uk

15) Meen, G. (1999). Regional house prices and the ripple effect: A new interpretation. *Housing Studies*, *14*(6), 733–753.

16) Nneji, O., Brooks, C., & Ward, C. W. R. (2015). House price dynamics and their reaction to macroeconomic changes. *Journal of Real Estate Finance and Economics*, *50*(1), 1–27.

17) Office for National Statistics. (2025). *Home*. ons.gov.uk

18) Ohnishi, T., Mizuno, T., Shimizu, C., & Watanabe, T. (2011). *The evolution of house price distribution* (RIETI Discussion Paper Series 11-E-019). rieti.go.jp

19) Statista. (2025). *Statista - the statistics portal for market data, market research and market studies*. statista.com

20) UK Government. (2025). https://www.gov.uk

21) VERITEX Group. (2025). veritexgroup.com.ua

22) Watkins, C. (2001). The definition and identification of housing submarkets. *Environment and Planning A*, *33*(12), 2235–2253.