EXPLAINING RESIDENTIAL PROPERTY PRICE VARIATION IN LONDON USING MULTIPLE LINEAR REGRESSION IN EVIEWS

1. Overview

Client:

A UK-based property investment advisory firm serving institutional real estate investors and mortgage consultants

Objective:

To use EViews for modeling and interpreting the determinants of residential property prices across London boroughs, helping guide investment strategy, pricing analytics, and housing market outlooks.

2. Background

With property values in London showing significant variation across boroughs and time, the client needed a statistically rigorous model to quantify what drives housing prices. Previous reports were descriptive. A formal multiple regression using EViews was required to isolate the effects of location, housing size, mortgage rate, and amenities.

3. Data Summary

Dataset:

Merged dataset from Land Registry, UK Finance, and ONS for the year 2021 (cross-sectional)

Sample Size:

1,200 property-level records, evenly distributed across London boroughs

Variables Used:

Variable	Type	Description
Property_Price (log)	Continuous	Log of final sale price in GBP
Square_Feet	Continuous	Interior living space in square feet

Borough	Categorical	Dummy-coded (e.g., Camden, Hackney, Westminster, etc.)
Bedrooms	Continuous	Total number of bedrooms
Interest_Rate	Continuous	Avg. mortgage rate at time of transaction (%)
Proximity_Tube	Dummy	1 = Within 800m of Tube station, 0 = Otherwise
Year_Built_Category	Categorical	Dummy: Pre-1950, 1950–1990, Post-1990

4. Methodology

Software Used:

EViews 13

Model Type:

Multiple Linear Regression (OLS)

EViews Workflow:

1. **Data Import and Preparation:**
    - Imported CSV with merged variables
    - Generated dummy variables for Boroughs and Year_Built_Category using genr
    - Inspected correlation matrix for multicollinearity
2. **Regression Setup:**
    - *Estimate Equation* with log(Property_Price) as the dependent variable
    - Regressors: Square_Feet, Bedrooms, Interest_Rate, Tube Proximity, Borough dummies, Year_Built dummies
3. **Diagnostics and Robustness:**
    - Heteroskedasticity test (White)
    - Multicollinearity checked using VIF
    - Outlier detection with studentized residuals
    - Robust standard errors applied

5. Key Results

Predictor	Coefficient (β)	p-value	Interpretation
Square Feet	0.00065	0.000	Each additional sq ft increases price by ~0.065%
Bedrooms	0.049	0.004	Each bedroom adds ~5% to property price
Interest Rate	–0.072	0.021	1% rise in mortgage rate lowers average price by ~7.2%
Tube Proximity	0.081	0.007	Properties near a Tube station are priced ~8.4% higher
Borough: Westminster	0.165	0.000	Westminster adds ~18% premium over base borough (reference)
Year Built: Post-1990	0.037	0.039	Newer properties command ~3.8% higher values

Adjusted R^2: 0.71 **F-Statistic:** Highly significant **VIF values:** All below 3.0 (no multicollinearity)

6. Visual Outputs (EViews)

- Actual vs. predicted price scatterplot
- Histogram of residuals
- Standardized beta coefficients bar graph
- Spatial price prediction map (external overlay in Excel)

7. Deliverables

- EViews .wf1 project with full regression setup and diagnostics
- Regression report (14 pages) including:
    - EViews screenshots
    - Output tables and coefficient interpretation
    - Summary visuals and price influencers

- Executive summary (2 pages) with bullet-point findings for investment decision-makers

8. Outcome & Client Use

- Used by client to advise foreign property buyers on borough-level pricing
- Incorporated into mortgage pre-approval risk model
- Helped inform real estate newsletter forecasts on borough market movements

9. Strategic Value Delivered

- Delivered **quantitative insights into spatial and structural price drivers**
- Enabled client to back advisory services with **statistical evidence**
- Introduced EViews-based modeling for future use in time series pricing trends