

The dynamics of the UK housing market: A complexity view

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Abstract

The UK housing market is one of the most dynamic in the world. As within any complex financial or economic system, a number of factors play a role in establishing and defining asset sale values and volumes. By analyzing pricing data from over 19 million house sales within England and Wales, spanning a 20 year period, we have identified two distinct regions within the house price distribution curve: a lognormal region for lower prices, and a power law above a certain threshold. We find that the formation of these regions can be theoretically reproduced by a relatively simple model involving very few parameters. Moreover, the particular distributions at more localized geographies can be explained based on the correlations between these parameters and selected local market data.

Keywords: House market, Financial Systems, Complexity Sciences

Introduction

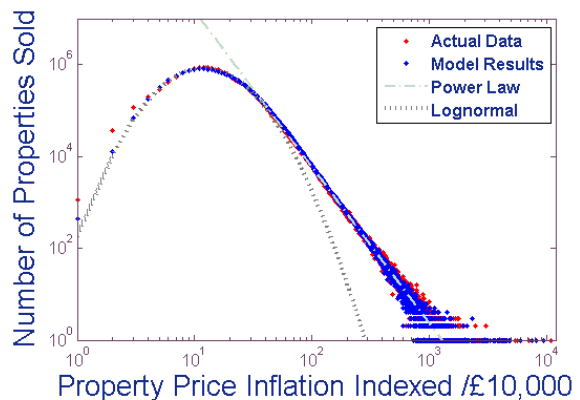
The relatively large importance of the housing market to the UK economy makes it an area of significant interest and public debate among economists, lawmakers and citizens alike. As a result, a substantial amount of research is continuously undertaken, mostly based on traditional economic indicators of trends in supply and demand, with the aim of forecasting house price inflation (or deflation) (see e.g. [1]).

We propose an alternative approach focusing on understanding the relative distribution of house prices, and the fundamental mechanism driving the formation of this distribution. Ultimately, we believe that incorporating these dynamics and mechanisms into traditional house price forecasting models may well lead to richer insight and results.

Preliminary Analysis

Our preliminary analysis indicates the existence of a lognormal region for lower house prices, with a transition to a power law behavior above a certain threshold. The (inflationary indexed) house price distribution is shown in *Figure 1* below.

FIGURE 1



Moreover, inspired by Mitzenmacher's Recursive Forest File Model [2], we have developed a simplified model which broadly reproduces the actual data as shown in *Figure 1* above. This agreement can also be reproduced for subsets of the data, for example in considering more localized geographies such as Central London in isolation.

Key References

- [1] UK Office for Budget Responsibility, Supplementary forecast information release: House price model. Web address: budgetresponsibility.org.uk/pubs/House-price-model-Dec-13.pdf (2013)
- [2] Michael Mitzenmacher, "Dynamic Models for File Sizes and Double Pareto Distributions", *Internet Mathematics* Vol. 1, No. 3: 305-333 (2003).

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