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UK house price convergence clubs and spillovers☆

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ABSTRACT

Using a number of advanced statistical methods, this paper analyses the convergence and spillover effects of house prices across UK regions. In contrast to the single steady state often assumed in modern macroeconomic analyses, we find that house prices across UK regions can be grouped into four clusters, confirming the heterogeneity and complexity of the UK housing market. Moreover we document the dynamics of house price spillovers across regions.

1. Introduction

The role played by the housing market in the latest financial crash and the following Great Recession, has led macroeconomic theory to investigate the contribution of housing wealth to the business cycle. This is frequently discussed by incorporating into a DSGE framework the household sector,[1] whose consumption depends upon income and housing wealth.[2] The ultimate aim of the literature is to understand whether housing has an impact on economic fluctuations (see e.g. Iacoviello and Neri (2010)) in order to improve the forecastability of the business cycle and to formulate appropriate policy responses. The model solution is provided by nonlinear equations, which are then linearised (or log-linearised) so as to obtain fluctuations around the steady state as well as decision rules. This is similar to the assumption that the economy is subject to only small disturbances and, importantly, the resulting equilibrium is unique. Since the steady state is defined under certain modelling conditions, it is important to evaluate whether this prediction and uniqueness are supported by the data.

We contribute to the literature by testing whether the UK housing market is characterised by a single long run equilibrium, which all economic regions converge to. Although the UK housing market has been subject to extensive research, there is no clear agreement on whether a long-run convergence path exists. Early studies (e.g. MacDonald and Taylor, 1993) fail to find a robust convergence path; more recently Cook (2006) suggests that the previous negative evidence might be caused by asymmetric adjustment across regions. Holmes and Grimes (2008) find favourable evidence but suggest that moving towards a long-run equilibrium could be slow and takes quite a long time.

To this end, the novelty of this paper consists of the implementation of a log *t* test (Phillips and Sul, 2007b) to

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[1] The DSGE stands for the dynamic stochastic general equilibrium.

[2] See Iacoviello (2010, 2011) for a review and the influential model presented in Iacoviello and Neri (2010).

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test whether multiple equilibria (i.e. convergence clubs) are present.[3] This approach has attractive features regarding the treatment of the steady state (or the common factor); among others, we can not only estimate the number of steady states among regional markets endogenously by the data, but can also analyse the compositions of convergence clubs. Furthermore, we complement our analysis by looking at house price spillovers across regions, and analyse the differences in the dynamics that drive return (i.e. inflation) and volatility spillovers over time for UK regions. The variance decomposition analysis based on the vector autoregression (VAR) model allows us to identify spillovers due to return and volatility shocks.

In a nutshell, our results suggest the presence of multiple steady states (convergence clubs) in the UK housing market. While London's housing market is very influential over other regions' (i.e., the ripple effect), inter-regional effects are also observed within convergence clubs, yielding regional diversity in the UK housing market. This departs from a single steady state often assumed by macroeconomic models.

2. Literature survey

Numerous studies have investigated the dynamics of national and regional house prices. We can identify two strands in the literature. The first is concerned with house price valuation; here, the main objective is to understand the link between economic fundamentals and property valuation, both at a national and at a regional level (see e.g. Cameron et al., 2006). The aim is to try to identify which macroeconomic factors can help policy-makers to detect possible deviation from fundamentals and the formation of bubbles. As Muellbauer and Murphy (2008, p. 5) explain, "the deviation of prices from long-run fundamentals is then the bubble-burster." More specifically, house prices may surge due to a series of positive shocks to fundamentals such as households earnings. Thus, the expectation of further appreciation leads to overvaluation, but in due course the realisation that improvement in fundamentals has been outpaced by house price increases, leads to a slowdown in the rate of appreciation.[4] McMillan and Speight (2010) analyse deviations of house prices from fundamental values in terms of the present value model of the asset price literature. Here the price of an asset is explained by the fundamental, which is the expected future payoffs of the asset itself; in the stock market literature these payoffs are dividends, while for bonds they are represented by interest and principal payments. The theoretical underpinning for the hypothesis that current price earnings ratios predict future movements in stock prices. In applying this methodology to the housing market the authors utilise the price-to-income ratio to investigate possible irrational deviations from fundamentals, nevertheless we should expect the current price-to-rent ratio, rather than price-to-income, to fit the theoretical model and predict future movements in house prices. In fact it is the rent rather than the personal income which represents the stream of future payoffs for the owner of the dwelling.

The second strand in the literature investigates the dynamics developing in regional property prices and the possible existence of a 'ripple effect'. If regions were geographically close entities then standard economy theory would suggest that the level of house prices within a certain area would be determined by the local demand and supply. Hence house prices across regions would be on different levels and would move independently although they would be still determined by similar economic factors (e.g. demographic factors and economic conditions). This idea was first challenged by Meen (1999) who introduced the possibility of a 'ripple effect' in the housing market. This refers to the fact that changes in the housing market are first observed in one region (usually the core region), and then they are transmitted to the adjacent regions, followed by propagation to other, more peripheral, regions. He suggested that this effect is driven by four different factors: migration, equity transfer, spatial arbitrage and spatial patterns.

Starting from the seminal paper by Meen (1999) the literature has proposed testing this hypothesis using various econometric techniques. The first approach has been to use cointegration analysis to investigate the notion of a causal long-run link between different regional house prices, in this spirit the works of, among others, MacDonald and Taylor (1993) and Alexander and Barrow (1994).[5] Results for the UK economy are not conclusive, while MacDonald and Taylor (1993) and Alexander and Barrow (1994) find that a long-run relationship exists, Ashworth and Parker (1997) cast doubts on these results. A second econometric approach to test the 'ripple effect' is by a using unit root test. As Cook (2005) explains, the diffusion of changes in house prices that the 'ripple effect' implies, is consistent with a constant long-run ratio of regional to aggregate house prices. He finds that the aforementioned ratio is stationary for a number of UK regions thereby supporting the notion of a 'ripple effect'.[6] More recently, Holmes and Grimes (2008) find that the first principal component of the differentials between regional and national house prices is stationary, implying that UK regional house prices are driven by a single common stochastic trend.

We follow more closely the second strand of the literature. In particular, we test for multiple equilibria (i.e. convergence clubs) in the various housing markets across the UK and then investigate spillovers across the UK.

3. Econometric framework

This paper uses mainly two statistical approaches in order to analyse regional inflation. First, we use the log t test to examine if there is convergence in regional inflation. There are other approaches

[3] This method has been implemented in economic growth literature (e.g., Phillips and Sul (2007a, 2009) as well as in convergence in prices Phillips and Sul (2007b)).

[4] There is a relatively vast literature examining the boom in house prices; mainly covering countries which experienced a major boom during the nineties. See e.g., Cameron et al. (2006) and Black et al. (2006) in the UK, Abelson et al. (2005) in Australia; and Stevenson (2008) in Ireland. A cross-country comparison is provided by Girouard et al. (2006)

[5] Chen et al. (2011) use a similar methodology for Taiwan, while Gupta and Miller (2012) investigate the US market.

[6] A similar conclusion, using a two-stage procedure, is reached by Cook and Thomas (2003). This is one of few studies to consider volatility rankings rather than just price rankings.