



Real estate markets and the macroeconomy: A dynamic coherence framework

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ABSTRACT

This paper analyzes the dynamic interactions between real estate markets, in the US and the UK and their macroeconomic environments. We apply a new approach based on a dynamic coherence function (DCF) to study these interactions bringing together different real estate markets (the securitized market, the commercial market and the residential market). The results suggest that there is a common trend that drives the different real estate markets in the UK and the US, particularly in the long run, since they have a similar shape of the DCF. We also find that, in the US, wealth and housing expenditure channels are very conducive during real estate crises. However, in the UK, only the wealth effect is significant as a transmission channel during real estate market downturns. In addition, real estate markets in the UK and the US react differently to institutional shocks. This brings some insights on the conduct of monetary policy in order to avoid disturbances in real estate markets.

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1. Introduction

The recent global economic downturn, attributed to the subprime crisis in the US with rapid worldwide contagion particularly in the housing sector, has attracted the attention of academics, policy makers, and economic agents at large. The magnitude of economic instability caused by the real estate sector highlighted the need to study the relationship between real estate and monetary policy to identify shocks that drive recessions. This issue is one of major concerns for central banks especially due to the role of housing as collateral. Since the 1990s, central banks have succeeded in their objective of price stability by means of inflation targeting policy but they failed to prevent asset prices bubbles and having negative real effects. Therefore, the recent emergence of boom-bust cycles in house prices, which was followed by a significant contraction in the real economy is very concerning to policy makers (Iacoviello and Neri, 2010; Reinhart and Rogoff, 2008).

One of the most important characteristics of asset prices is their quick reaction to news. According to Rigobon and Sack (2004) and Bernanke and Kuttner (2005), asset prices react quickly to monetary policy announcements. They are not only considered as a source of

disturbance but also as a shock transmission channel (Mishkin, 2007). It is, thus crucial for central banks to analyze thoroughly the effects of monetary policy on asset prices in general, and on real estate in particular. However, the existing literature has focused mainly on the housing sector and its concomitant interaction with the economy (Ahearn et al., 2005; Bjørnland and Jacobsen, 2010; Iacoviello, 2005; Iacoviello and Neri, 2010; Vargas-Silva, 2008). The main reason is that houses are commonly used as collateral for loans, so that a large portion of financial assets could be affected by housing values. In contrast, this paper provides an analysis of different real estate sectors and their linkages within the macroeconomic environment.

This study analyzes interactions between real estate markets in the UK and the US and their relative macroeconomic environments. Our analysis differs from previous studies in two ways. Firstly, we compare a small and a large economy that have different practices in the real estate markets¹ in order to see the degree of the convergence or divergence these two countries have with their economies. Secondly, this study brings together different real estate markets, the securitized market, the commercial market and the residential market. We do this because real estate indices are constructed differently. Thus, the sensitivity to macroeconomic factors might vary across the different real estate markets. Therefore, we can have a

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¹ For instance, mortgages in the UK are mainly based on short term interest rates. However, most of mortgages in the US are based on long term interest rates (Borio, 1995).

better understanding of transmission mechanisms between real estate markets and the macroeconomic environment and take the relevant actions when shocks hit one of the markets.

Moreover, this paper contains some empirical contributions. We use a dynamic coherence function (DCF), developed by Ftiti (2010). It is based on the theory of evolutionary co-spectral analysis proposed by Priestley and Tong (1973). This is the first time that this methodology is used in the literature to measure the degree of interaction (co-movement) between real estate markets and macroeconomic variables. The DCF approach has many advantages. Firstly, it takes into account the dynamic dependence between time series. Secondly, this measure is useful for non-stationary series. Thus, we do not need any prior treatment of stationarity for the data. So, it allows us not to lose any information related to the real estate data that require already some processing of smoothing, appraisal and aggregation.

The rest of the paper is organized as follows. Section 2 reviews the related literature on the linkages between real estate markets and macroeconomy. Section 3 explains the methodology and presents the data used in the study. Section 4 provides the empirical results. Finally, Section 5 concludes.

2. Related literature

Real estate crises can have major consequences on the economy. Many studies found that collapses in house prices are at the heart of many financial crises (Iacoviello and Neri, 2010; Leamer, 2007; Reinhart and Rogoff, 2008). Thus the booms and busts in real estate markets have been an issue of concern for policy makers. In fact, central banks and the International Monetary Fund (IMF) studied the impact that monetary policy has on the residential sector. For instance, Mishkin (2007) discusses the role of housing in the monetary transmission mechanism and the implications that this role can have for the conduct of monetary policy. Despite the important role of housing for monetary policy, he does not agree with emphasizing the role of house prices within monetary policy, given that central banks cannot easily identify housing bubbles. He suggests that monetary policy should take into account house prices only to the extent that they have predictable effects on inflation and employment. But this is peculiar to the US as a large economy where real estate bubbles are regional. This makes targeting real estate prices a harder task to achieve. This idea is supported by Allen and Carletti (2010) in a theoretical model of real estate bubbles. They suggest that interest rates can be used as an instrument to prevent these bubbles, but only in small homogeneous economies, not in large ones. For instance, Sweden as a small economy, takes into account the housing prices or real estate prices in the implementation of monetary policy. The Swedish central bank considers real estate prices when it makes a real interest rate decision by adjusting monetary policy to face a rapid increase in house prices (Ingves, 2007). Consequently, we have chosen both a large economy (US) and a smaller economy (UK) to study the degree of co-movements between real estate markets and the macroeconomy in order to find some conclusions about the effectiveness of targeting real estate prices in two differently sized economies.

Numerous studies have attempted to explain the linkages that real estate markets have with the macroeconomy using different tools. On the one hand, some authors use theoretical models to study these linkages. Indeed, in their study of business cycles, Ahearne et al. (2005) find through their analysis that housing prices show co-movements with the macroeconomic environment and that house price booms are preceded by loose monetary policy. Iacoviello (2005) and Iacoviello and Neri (2010) find a strong linkage between economic activity and the residential market in the US by means of Dynamic Stochastic General Equilibrium Models (DSGE) to study this relationship.

A different strand of the literature studies the relationship between real estate markets and the macroeconomy using empirical models, among them the vector autoregressive models (VAR). In their study

of the links between the housing sector and the macroeconomy, Bjørnland and Jacobsen (2010) use a structural VAR to study the interaction between real house prices in Norway, Sweden and the UK and their relative macroeconomic characteristics. They find that unexpected changes in interest rates have an immediate effect on house prices and that the role of housing increases considerably when the interest rate and the house prices react at the same time. This highlights its role as a monetary transmission channel.

McCue and Kling (1994) study the US securitized market by modeling the filtered equity Real Estate Investment Trusts (REITs) by an unrestricted VAR. They suggest that 60% of the variation in real estate prices is explained by the macroeconomy. It is thus the nominal short term interest rate variable that explains the majority of real estate price movement, while the output and the investment variables explain less of the variations in real estate markets.

Also, by using a VAR model on filtered real estate returns, property returns series and a range of economic and financial factors, Brooks and Tsolacos (2001) find that unexpected inflation and the interest rate term spread have explanatory powers for the UK property market.

The recent study of Bredin et al. (2011) deals with the impact of the unexpected component of monetary policy, proxied by futures market. By using a structural VAR, they confirm that REITs respond negatively to interest rate surprises, which confirms the sensitivity of real estate to monetary policy. Ewing and Payne (2005) employ generalized impulse response on the total returns of US equity REITs, finding that a shock in economic growth, in inflation and in monetary policy cause a fall in expected REIT returns. However unexpected default risk premia of REITs are positively linked to future REIT returns.

Another branch of empirical studies uses the Vector Error Correction Model (VECM). Following the study of Bjørnland and Jacobsen (2010), Schätz and Sebastian (2009) restrict their study to the property markets in the UK and Germany. They apply a VECM only on appraisal-based property indices. They find that the long term equilibrium in the real estate sectors of both economies is determined by the same macroeconomic factors: consumer prices, government bonds and the unemployment rate. There is a positive linkage between the property markets and the consumer prices as well as government bonds. In addition, their analysis shows a significant role of the labor market appearing in both economies through a negative linkage between property markets and the unemployment rates. Furthermore, Hoesli et al. (2008), apply a VECM to general equity, and small capitalization stock returns in the UK and the US to see their interaction with a range of macroeconomic variables with an emphasis on the role of real estate as inflation hedge. They find that when both real and monetary variables are included, asset returns are positively linked in the long run to anticipated inflation but not to unexpected shocks in inflation. They suggest also that the results can be driven by appraisal effects particularly in the UK market.

Another part of the literature study the links between the real estate sector and the macroeconomy using factor models. For instance, in an FVAR framework, Gupta et al. (2010) find that real house price growth in South Africa responds negatively to positive monetary shocks. The response of housing prices does, however, depend on its market segmentation.

Ling and Naranjo (1997) study the sensitivity of commercial real estate returns in the US to a range of macroeconomic risk factors using a Multifactor Asset Pricing Model (MAP). Their main result is that commercial real estate returns are influenced by the term structure of interest rates and unexpected inflation, the growth rate in real per capita consumption and the real Treasury Bill rate.

In addition, Bredin et al. (2007) provided evidence of the response of REIT returns and their volatility to unexpected changes in monetary policy in a Generalized Autoregressive Conditional Heteroscedasticity (GARCH) framework.

Previous studies suffer from some drawbacks. Firstly, the focus in previous work was mainly, either on the residential sector, or the

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