Habitat International 40 (2013) 73–81

Contents lists available at SciVerse ScienceDirect

Habitat International

journal homepage: www.elsevier.com/locate/habitatint

Housing affordability, self-occupancy housing demand and housing price dynamics

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JEL classification:
R21
R31

Keywords:
Housing market cycle
Serial correlation
Mean reversion
Self-correcting pattern
Investment-motivated housing demand

A B S T R A C T

Classic theory suggests that the real estate market cycle reflects the consequences of an inherent self-correcting pattern. Previous studies found evidence showing the existence of two stochastic processes, serial correlation and mean reversion, in housing price dynamics. The present study utilized data from the Taiwan housing market to observe whether the self-correction pattern driven by housing demand occurs and whether it can explain the housing dynamics. This paper hypothesizes that the demand side of the housing market causes a self-correcting mechanism of housing prices. The hypotheses are examined using panel data of five major cities in Taiwan. Empirical evidence reveals that when housing prices rise, housing affordability decreases, followed by reduction in self-occupancy housing demand. Furthermore, change in demand structure raises the risk of prices dropping because of an increase in investment-motivated housing demand, eventually resulting in lower housing prices.

Introduction

Housing market demand declined in the United States, triggering a global financial crisis (i.e., subprime mortgage crisis). Considerable research has focused on factors that destabilized the housing market. Research topics, such as the housing market bubble, government control over the housing market, and irrational behavior of investors, have caught the attention of researchers. However, no sound mechanism in the housing market that is capable of preventing market irrationality appears to exist. Whether the housing market is highly inefficient and whether its cycle must consist of bubble and collapse are questions that need to be addressed.

Previous research reveals that those questions can be answered using classical theories. Roulac (1996) documents that the classic real estate market cycle reflects the consequences of an inherent self-correcting pattern of expansion, slowdown, contraction, correction, recovery, re-expansion, and so on. In classical theory, a self-correcting mechanism is initiated mainly by the supply side of the real estate market. Researchers begin from the perspective of a production element in macroeconomics: land.[1] When price of real estate rises, profit from invested land becomes higher compared to that from other investments (e.g., building factories for manufacturing products). Therefore, though the supply of land and real estate increases, it is followed by a price decrease. In a more recent paper, Glaeser, Gyourko, and Saiz (2008) also discuss the housing market cycle from the perspective of adjustment by the supply side. They compare the housing bubbles in different US states with different supply elasticities, and find that if supply is more inelastic, the duration of the housing bubble will be longer.

A number of researchers emphasize the influence of economic activities on the real estate market and discuss the relationship between the business cycle and housing market fluctuation (Baxter, 1996; Davis & Heathcote, 2005; Greenwood & Hercowitz, 1991; Jud & Winkler, 2002; Roulac & Volk, 1989). Moreover, Leamer (2007) claims that for the US, housing is a business cycle; he finds that developments in the housing sector actually lead to economic activity. Elbourne (2008) proposes a monetary transmission mechanism through the housing market and argues that monetary policies affect the economy through house prices. Hence, research related to the behaviors of housing prices is clearly important.

Research likewise explains the relationship between real estate and other markets.[2] Roulac (1996) integrates the relationships among variables and considers that the relationship among capital flow, space supply, property performance, and financial return can

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[1] Considerable literature discusses the issue of space.

[2] Discussions in these bodies of literature focus on cash flow between the real estate market and stock market, which initiates the relevance between the two markets (wealth effect). For example, Quan and Titman (1999), Green (2002), Sim and Chang (2006) and Tsai, Lee, and Chiang (2012) examine the relation between the two markets to test whether a wealth effect occurs between them.

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http://dx.doi.org/10.1016/j.habitatint.2013.02.006

potentially contribute to the housing market cycle. Fisher (1997) proposes the co-movement between residential and non-residential investments since complementarity exists between the household and business capital in the production of goods. According to the above literature, the relationship between the real estate market and other markets likewise explains real estate market fluctuation.

The next question revolves around the reason why the housing market continues to adjust at a slow pace, resulting in market bubble and collapse if a self-correcting mechanism (Roulac, 1996) is present in the real estate market. Several researchers suggest that this is caused by inappropriate government intervention. For example, in the case of subprime mortgage, excessive subsidy policy (Shiller, 2009) and easing monetary policy caused the housing market imbalance in the US. Issues on the impact of macroeconomic policy on housing market dynamics have been addressed as well by Muellbauer and Murphy (2008) and Goodhart and Hofmann (2008), to name a few. Existing literature focuses on discussing the impact of monetary policy on housing price (e.g., Iacoviello, 2005; Mishkin, 2007; Muellbauer & Murphy, 2008; Vargas-Silva, 2007).

Research likewise suggests that the market is not as efficient as assumed in theory (Case & Shiller, 1989; Shiller, 1993, 2005). This is because not all buyers behave rationally according to the hypothesis in the theoretical model, and their irrational behavior causes inefficiency in housing price.[3] Riddel (2004) also proposes a disequilibrium housing market model that separates disequilibrium caused by supply-side disturbances from demand-side disturbances. Riddel applies the model to the US housing market for the period 1967–1998 and finds that inefficiencies impede market clearing; thus, the market is characterized by sustained periods of disequilibrium.

Previous studies document that two kinds of dynamic behavior are present in housing price. The first is serial correlation (Abraham & Hendershott, 1993; Case & Shiller, 1989), which refers to the autocorrelation between different periods of housing price variation. The second is mean reversion (Abraham & Hendershott, 1993; Capozza & Seguin, 1996), which refers to the reversion of housing price to fundamental value. A number of researchers also observe that the dynamics of housing prices vary according to location (Abraham & Hendershott, 1993). Lamont and Stein (1999) suggest that this is due to different financial leverage of homeowners in different areas. Therefore, homeowners are sensitive to market impact to a different degree, reacting to the impact on housing price at different paces.

Housing price index is not merely "another" macroeconomic variable; in the same vein, adjustment in housing price index does not merely involve the change of economic variables. According to the discussion of Skinner (1989, 1996), Case, Quigley, and Shiller (2001), and Campbell and Cocco (2004), Leung (2004) proposes that significant fluctuations in housing price would imply significant fluctuations in wealth and thus potentially significant household wealth effects. According to Lamont and Stein (1999), change of housing price is possibly shaped by the household characteristics of different areas. Different dynamics of housing prices likewise significantly affect different households. For example, if houses are purchased during a housing boom, the buyer bears an increased burden. When an economic downturn is present, the income of buyers decreases, and they are forced to sell their homes as they are unable to afford their mortgage. If housing prices drop and hit bottom, buyers do not only lose their property but also accrue a massive debt due to capital loss in house trading. However, this situation is only reflected in the overall house price index and is merely the negative serial correlation of housing price or correction mechanism of returning to the mean reversion. If buyers purchase houses in a market with steadily increased price (variation of the housing price is in positive serial correlation), buyers continue to profit from house trading even if their salary decreases and their houses are sold. Therefore, the characteristics of housing price variation are essential to make the choice between renting and buying and for the strategic decision of property investment. Moreover, the discussion on whether the self-correction pattern occurs and whether the housing price dynamics can be explained by this pattern is crucial.

This paper focuses on the housing market in Taiwan, which is a distinctly emerging market. According to Tsai and Peng (2011), buyers continue to purchase houses, regardless of whether the market is booming or experiencing a housing price bubble and whether investor behavior is seemingly highly irrational. Tsai and Peng (2011) also find that this behavior leads to increasing burden on the part of buyers, signifying that the Taiwan market is extremely inefficient. Consequently, one may wonder whether the price-correcting mechanism is absent in the market.

A Chinese proverb reads: "Only land tenure contributes to wealth." Buyers do not only purchase houses for self-occupancy; housing is one of their favorite modes of investment. Buyers may continue to purchase houses for investment, even when the burden of housing investment increases. However, an increase in investment-motivated housing demand may influence the housing market structure. For example, Marshall and Marsh (2007) find that elasticity of demand is different for consumers as opposed to investors. Hence, whether differences exist between the market where demand motivated by self-occupancy is high and the market where investment-motivated demand is high must be examined.

This paper examines the self-correcting mechanism of housing price initiated by the demand side to investigate the previous question. This analysis employs the quantity of new housing supplied to control for factors from the supply side. The study proposes that increasing housing price lowers housing affordability, reduces consumer demand, and raises investor demand, eventually resulting in decreased housing price. Using Taiwanese data, the hypotheses are supported by empirical evidence, providing a theoretical basis for the government to control the housing market instability, which is created by increasing investment-motivated demand.

Literature reviews and hypotheses

Literature reviews

Roulac (1996) proposes that five critical interdependent forces constitute the real estate market and move in cyclic patterns: economic structure, space demand, space supply, capital flow, and investment performance. Although the reasons or determinates of cyclic patterns in different markets may vary, previous research on the real estate market cycle focuses more on discussing the cycle emerging from macroeconomic factors (Drucker, 1993) and the supply side of the housing market.

Leinberger (1993a, 1993b) specifies that the real estate market cycle consists of three general phases of market conditions: (1) upturn, lasting one to two years; (2) mature, lasting two to five years; and (3) downturn, lasting two to four years. However, the cyclic patterns in different markets during different periods are very different. Therefore, the real estate market cycle is difficult to forecast.

[3] Previous studies have sufficiently documented evidence showing that traders in the housing markets are irrational. For example, Genesove and Mayer (2001) examine trading data in the real estate markets of central Boston in the 1990s and confirm the presence of the "disposition effect," since real estate sellers were unwilling to recognize capital losses.