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Does liquidity affect housing market performance? An empirical study with spatial panel approach

Xian Zheng[a], E.C.M. Hui[b,*]

[a] Department of Economics, Jinan University, Guangzhou, China
[b] Department of Building and Real Estate, The Hong Kong Polytechnic University, Hong Kong

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ABSTRACT

This paper investigates the spatial effects of liquidity factors on housing market performance. We adopt the spatial panel approach to address spatial dependency and the spillover effect among neighboring housing estates. Using a special transaction database from the Economic Property Research Centre (EPRC), the results show that a higher housing liquidity level leads to a lower subsequent housing return, while the contemporary return increases with unexpected liquidity shock. Specifically, a 1% rise in the housing liquidity level leads to a 1.85% fall in the expected housing return in the following year, and a 1% unexpected liquidity shock would raise the contemporary housing return by 3.33%. Moreover, the results reveal strong spatial spillover effects of liquidity shocks in the Hong Kong housing market. This paper delivers useful implications for both policy makers and practitioners regarding spatial dependency and contagion among housing markets. The research framework and spatial approaches can be easily replicated and applied to other cities and regions.

1. Introduction

Liquidity is a complex concept which reflects the trading speed of a given market or asset. Generally, an illiquid market can be defined briefly as a market where assets cannot be sold efficiently or quickly due to search frictions, larger ask-bid spreads and asymmetric information between potential buyers and sellers. The housing market is such a market and displays these features of illiquidity. In the housing market, liquidity measures how fast a property owner can convert his property into cash, or, equivalently, how fast a buyer can convert cash into property, at low transaction cost. Intuitively, liquidity is a desirable feature for real estate investment, because owners can realize capital gains when the asset price increases, or they can cut losses before the asset price plunges any further (Ho, 2003).

Theoretically, buyer and/or seller incur a transaction cost (e.g. searching cost, transaction fee/tax, brokerage charge, etc.) when a housing property is traded. A rational buyer, who buys an illiquid property and expects further transaction costs when they want to sell the property, will take the liquidity factor into account when setting the reservation price. Besides, if the liquidity deteriorates and the transaction cost increases, this should exert a negative effect on current housing prices and increase the expected return given that the liquidity shock is persistent. In equilibrium, investors associated with illiquid assets ask for a higher risk premium in compensation for exposure to the liquidity risk. The liquidity level should therefore be negatively related to subsequent asset returns. On the other hand, positive unexpected liquidity shock (i.e. higher realized liquidity) raises prevailing housing prices, implying a positive relationship between unexpected liquidity shock and contemporary returns (Fisher et al., 2003; Zheng, 2013).

The relationship between security return and liquidity factor has produced fruitful results in the recent financial literature.[1] The literature prior to this reached consensus that expected return is an increasing function of illiquidity. This implies that liquidity level and liquidity risk are important factors in explaining security returns. Investors, who anticipate paying liquidity-induced transaction costs sometime in the future when they sell their assets, would rationally discount the asset (i.e. higher expected returns) if liquidity is low (or transaction cost is high). In other words, an asset with higher liquidity is likely to be associated with a higher present price and hence a lower expected return. On the other hand, if an asset receives a positive unexpected liquidity shock, the actual liquidity becomes higher than expected, which would

* Corresponding author.
E-mail addresses: bsxzheng@gmail.com (X. Zheng), bscmhui@polyu.edu.hk (E.C.M. Hui).

[1] See Campbell et al. (1993); Pástor and Stambaugh (2003); Sadka (2006); Korajczyk and Sadka (2008); Watanabe and Watanabe (2008) for examples from the stock market.

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lead to a downward adjustment of expected future returns. It is expected that this would result in higher current housing prices and an increase in observed contemporary housing returns.

However, there is a paucity of studies in the literature with respect to the relationship between liquidity and return in the housing market. The housing market is by nature less liquid than the financial market, and liquidity could be a crucial pricing factor that affects housing prices (Zheng et al., 2015). First, housing market is characterized by information asymmetry, costly searching, inelastic supply and short-sale constraints, implying that investors in the housing market may incur a higher level of liquidity risk. Second, the liquidity risk in the housing market cannot be easily diversified due to the absence of derivatives. Third, liquidity shock is more persistent in the housing market compared with that in the securities market, since the housing market is less efficient than the securities market. Lastly, liquidity in the housing market may have spatial spillover related to immobile and adjacency effects (e.g. Can and Megbolugbe, 1997), which may reinforce the influence of liquidity. Therefore, it is expected that the role that the liquidity factor plays in explaining housing market performance might be significant and substantial.

There are good reasons to expect that liquidity of the housing market will exhibit a spillover effect within a local housing market, such as the signal effect, the adjacency effect and investor sentiment contagions. In contrast to the stock market, there is no centralized market for real estate transactions. Both buyers and sellers would likely use similar transactions in neighboring housing units as a reference for determining their reservation prices. Hence, the transaction price of (a unit in) a housing estate[2] is usually set with knowledge of the recent selling prices of (those of) similar estates nearby (e.g. Clayton et al., 2009; Wong et al., 2013). A higher level of liquidity (i.e. more trading records) would provide more information since more comparable sales would be available (Fisher et al., 2003; Zheng et al., 2015). In other words, the information carried by the price and liquidity of one housing property will therefore affect the prices of the surrounding housing properties (e.g. Anselin, 2003; Osland, 2010). The omission of spatial effects may result in estimators being inefficient or even inconsistent. Controlling for the spatial structure and dependency of real estate markets is thus essential to explaining housing price differentials and deriving accurate coefficient estimates of interest.

To the best of our knowledge, this is one of the first empirical studies to link housing price and liquidity using a spatial econometric approach. It seeks to add to the understanding of the role that liquidity plays in explaining housing price differentials by incorporating spatial dependency among housing estates. As discussed above, we examine the following hypotheses with respect to the liquidity effects over time on the expected housing returns:

- Hypothesis 1: Lower liquidity leads to higher expected housing returns;
- Hypothesis 2: Unexpected liquidity shock has a positive impact on contemporary housing returns;
- Hypothesis 3: An increase in investor sentiment (reflected by unexpected liquidity shock) for a housing estate will generate positive spillovers to surrounding housing estates.

To test the above hypotheses, we construct two types of liquidity factor and adopt the spatial Durbin model (SDM) to disentangle the direct effect and spillover effect (or indirect effect) of the housing liquidity factor on expected housing return at the estate level. The remainder of the paper is organized as follows: Section 2 reviews the related literature; Section 3 presents the data and methods; Section 4 presents the results of the panel spatial model and robustness check; and Section 5 provides concluding remarks and implications.

2. Literature review

2.1. Liquidity and housing price

Over the past two decades, many studies have found that lower liquidity assets (e.g. bond, stock) offer higher expected returns (see Amihud and Mendelson, 1986; Pástor and Stambaugh, 2003 to name but a few). Besides, liquidity changes with time (e.g. Watanabe and Watanabe, 2008). Therefore, risk adverse investors, who are exposed to liquidity risk, would require compensation for bearing that risk. Moreover, liquidity is widely adopted as an indirect sentiment indicator in behavioral financial studies, which find solid evidence that investor sentiment reliably predicts market returns in both short-term (Brown and Cliff, 2004) and long-term (e.g. Brown and Cliff, 2005 Yu and Yuan, 2011). For example, Baker and Stein (2004) used the aggregate market liquidity factor as a proxy of investor sentiment and explained why increases in liquidity were associated with lower subsequent returns (see also Baker and Wurgler, 2006, 2007).

In the real estate studies, many scholars have dedicated themselves to understanding the price mechanism from the perspective of liquidity or investor sentiment. For example, Krainer and LeRoy (2002) proposed an equilibrium model of illiquid asset valuation of the housing market based on search and matching theory. In their theoretical model, housing illiquidity is measured by asymmetric information between buyers and sellers. Indeed, an increase in market liquidity would reduce information frictions. Kawaguchi et al. (2007) investigated how liquidity risk affects expected commercial real estate returns. Using a two-regime switching regression model and logistic regression (logit) model, they found that illiquidity predicted a higher expected return in the commercial real estate market. Tu et al. (2009) studied the relationship between the housing price dynamic and the turnover rate in Singapore's condominium market. Using transaction data, they found a significant result in the fact that an increase in housing prices led to housing turnovers, while higher volatilities reduced housing turnover. Clayton et al. (2009) employed a specified Vector Error Correction model to investigate the roles of both fundamental and non-fundamental (sentiment) factors in commercial real estate valuation. Their results showed that an investor's sentiment had significant effects on the acquisition prices of commercial real estate. Fisher et al. (2009) investigated the short-term and long-term dynamics among institutional capital flows and returns in the USA's private (commercial) real estate market. They found that lagged institutional flows significantly influenced subsequent real returns at the aggregate level. At the metropolitan level, however, only a limited number of areas supported this relationship. Ling et al. (2010) found a positive relationship between investor sentiment and subsequent quarter returns in both public and private real estate markets using short-term vector auto-regression (VAR) analysis.

The liquidity of the housing market, on the other hand, is significantly different from that of the stock market in several dimensions. First, the price of a particular housing property will be observed only if it is transacted. The recorded transaction prices are conditional on the market liquidity level at the time of sale (Clayton et al., 2009). Second, housing properties are transacted in a decentralized market with high searching and transaction costs, which will ultimately be embodied in the transaction price. Third, the

[2] An estate in Hong Kong is referred to as a large area of land with many housing units multi-owned by people or households. As an analogy, the units of an estate are similar to the shares of a company, though the units may or may not be the same in physical attributes, etc.