



*Commercial and Residential Real Estate Market Liquidity*  
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# Chapter 5

## Conclusion and summary “Commercial and residential real estate market liquidity”

Je gaat het pas zien als je het door hebt.

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The main question of this thesis is: “What is the role of market liquidity in real estate assets?” The role of market liquidity is fundamentally related to price movements in real estate. As such, prices and liquidity should not be viewed as separate concepts. This thesis offered several novel measures for real estate market liquidity. All the measures used and constructed in this thesis show strong cyclical movements and a strong co-movement with prices. This indicates that not only price movements should be tracked by policymakers, market watchers, and market participants. A better and completer picture of the market can be painted when analyzing both liquidity and price movements. Maybe even more importantly, all chapters in this thesis show that liquidity movements tend to lead price movements. This insight could help policymakers in spotting crises and overheating markets early on.

## 5.1 How can real estate market liquidity be measured?

The lack of well-established ways to measure market liquidity led to sub question (i): “How can real estate market liquidity be measured?” All three chapters use different measures that relate to market liquidity and provide similar answers to this question.

**Chapter 2** constructs a methodology that allows for the construction of constant-quality liquidity indices when transaction data are sparse. The presented methodology addresses the problem that the quality of sold houses differs over time. Furthermore, in some periods it might be the case that more properties are withdrawn. The latter is treated as a censoring problem and is explicitly taken into account in the methodology. One of the main advantages of the presented method is that it can also be used in thin markets (i.e. markets with few transactions). In thin markets, indices produced by conventional methods may be unreliable. The proposed methodology introduces a structure on the estimated coefficients that allows to create reliable indices in these markets. Moreover, the presented methodology corrects for both quality and withdrawals. The results suggest that withdrawals are the main driver of the difference between the average time on market (TOM) of sold properties and the proposed measure. Quality, however, also plays a significant role. The quality of sold properties is different over the cycle.

**Chapter 3** extends the constant-liquidity price index methodology introduced by Fisher et al. (2003) in two ways: (i) by casting the method in a repeat sales framework, and (ii) by estimating the model in a structural time series format. As a result, it is possible to disentangle reservation prices of buyers and sellers for commercial real estate at a city level without the need of a substantial set of property characteristics. The difference between the central tendencies of buyers’ and sellers’ reservation prices can be seen as a measure for market liquidity. This is analogous to the widely used bid-ask spread measure in the stock market. The presented method is a very general method to construct constant-liquidity price indices and liquidity indices as it can be applied to every data set in which repeat sales can be identified and for which transaction prices are known. By estimating the model in a structural time series format, the model can also be estimated for thin markets.

**Chapter 4** provides evidence that a measure for market tightness

based on internet search behavior –*clicks per house*– Granger causes changes in market liquidity based on transaction data –*rate of sale*. The underlying reason is that internet search behavior signals preparatory steps to spend. The response goes in two ways: internet search behavior also responds to changes in liquidity. The relationship between changes in liquidity and clicks per house is found to be negative, possibly because more houses sold in the previous quarter indicates that there are fewer potential buyers left who are searching in a particular municipality.

## 5.2 What is the relationship between prices and market liquidity in real estate markets?

In the real estate literature, there is a strong focus on the interaction between market liquidity and prices. The chapters in this thesis also shed light on this question. In general, prices and liquidity are very much pro-cyclical and liquidity tends to lead prices.

Using the constant-quality TOM indices of **Chapter 2** it is shown for the Dutch housing market that during busts the TOM is high and market liquidity is low. Furthermore, it is shown that there exists a commonality between the constructed liquidity indices and transaction price indices. Additionally, a Granger causality analysis shows that liquidity changes lead price changes. A novel finding, consistent with the general asset pricing literature, is that liquidity risk is also higher in busts. Chapter 2 also looks at the relationship between the list price premium and the TOM. A higher list price premium (i.e. a higher list price compared to the predicted market value) is related to a lower sale probability. The effect is shown to be varying over time, in busts both the average list price premium and the total effect on sale probability increases. In the most recent years (since 2015), the list price premium turns, on average, into a list price discount. The reason is that sellers change their behavior due to the extreme tightness of the market.

**Chapter 3** suggests that in all major US commercial real estate markets –for most of the time– liquidity is pro-cyclical. Because liquidity varies over time, “normal” price indices (i.e. observed transaction price indices) provide –in some sense– an apples versus oranges comparison. This chapter provides a way to correct repeat sales price indices for varying liquidity. The result is that the constant-liquidity indices (demand reservation price indices) are more cyclical than normal price

indices and supply reservation price indices. The results further indicate that the supply and normal price indices tend to move slower than the demand indices. Note that this chapter is based on US commercial real estate data, the other two are based on Dutch residential data. It might be the case that the relationship between prices and liquidity is different for commercial and residential real estate as well as for US and Dutch real estate. For example, commercial real estate is more of an investment good than residential real estate, which is more of a consumption good. Additionally, (some) US markets are much less supply-constrained than most Dutch markets, which may also have implications for the relationship. Moreover, the mortgage markets are different. This might have implications for reservation price behavior. For example, one might argue that anchoring behavior is stronger in markets with high mortgage debt as the negative equity problem can become larger. Apart from these descriptive differences, I will leave a more thorough examination of these differences for future research.

**Chapter 4** presents a theoretical and empirical model where transaction prices, market tightness, and market liquidity are allowed to interact. The chapter further provides insights into differences in temporal dynamics and geographical variations. The results show that changes in market tightness based on internet search data (clicks per house), Granger causes (1) changes in market liquidity (breath of the market), and (2) house price changes. Furthermore, the results suggest that (3) liquidity responds relatively quickly to a demand shock and that prices respond more gradually. The effect on liquidity is temporary, and the effect on prices is permanent. The underlying theoretical mechanism is that when more buyers enter the market and market tightness increases, this will be reflected in an increase in the matching probability. Because of information asymmetries, sellers do not observe this increase immediately and will adapt their reservation and corresponding listing prices gradually. This results in a lagged response of prices, whereas market liquidity increases instantaneously. As for geographical differences, a demand shock is temporarily absorbed in market liquidity in urban areas. Prices adapt more gradually, and the effect is permanent. Following this price adjustment, liquidity reverts back close to its original level. In rural areas the effect runs straight from market tightness to prices, but the increase is still gradual as predicted by the search and matching model. The reason is that urban areas were recovering in the final year of the sample, whereas rural areas were not. This is also reflected in the model

estimated over the 50% regions with the most negative returns. Here, price discovery is found to be slower than in other regions which can be attributed to the low rate of sale in these regions. Theoretically, this would be reflected in sellers attaching more weight to their perception of market tightness yesterday than to signals of market tightness today.

### 5.3 How can market liquidity be used for a better understanding and monitoring of real estate market?

This thesis has shown that understanding market liquidity can be of vital importance for policymakers and other market watchers. In general, liquidity can be useful for both monitoring and forecasting purposes. Additionally, the pro-cyclicality of liquidity is related to the reservation price behavior of buyers and sellers. Especially the latter may be related to mortgage markets, which makes studying real estate liquidity particularly interesting for policymakers.

**Chapter 2** shows that the average TOM of sold properties –which is frequently used by practitioners as market liquidity indicator– might be misleading as the average TOM only considers properties that have been sold. Furthermore, traded properties are heterogeneous. Since the probability to withdraw and housing characteristics differ over the cycle, the average TOM could paint the wrong picture. These problems are more severe in small markets or markets where properties trade infrequently (i.e. during a crisis). The results show that simply taking the mean of the TOM of sold properties underestimates (overestimates) market liquidity in good (bad) times. In other words, the quality of the properties that are sold is different and/or the probability to withdraw is different.

**Chapter 3** shows that tracking demand and supply reservation prices gives more insight into the real estate market. For policymakers, the presented method is interesting from both a monitoring and forecasting perspective. The comparison of the demand and supply reservation price indices can provide a more extensive view of the current and historical state of the market than by simply observing normal price indices. Because the demand indices provide a collapsed metric of both prices and liquidity, they tend to lead price indices. As such, they can be useful for forecasting purposes of price indices. The lead-lag relationship be-

tween the demand and supply indices seems to be about a year. The lag of “normal” price indices to the demand indices is roughly two quarters.

**Chapter 4** provides theoretical and empirical evidence on the links between market tightness, market liquidity, and house prices. Understanding these links can help policymakers in comprehending the relationship between different indicators that policymakers tend to use to assess the market situation. Additionally, the chapter provides a novel indicator based on internet search behavior that is shown to lead other indicators. This can be useful to forecast housing markets on a regional scale. The lead-lag relationship between the market tightness indicator and market liquidity is about one quarter, prices respond more gradual and half of the shock is absorbed after about two quarters.