

Dissertation Abstract: Essays on Housing and Land Economics

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Chapter 1: A Model of Sales, Prices, and Liquidity in the Housing Market

I embed a search and matching model of the housing market into a DSGE framework and use it to address three main questions. First, what model of search and price determination best describes the housing market? Second, can a general equilibrium model generate the observed correlations between housing market variables? Third, what shocks have driven the historical behavior of the housing market, especially the recent boom and bust in house prices?

I consider two models of search and price determination, random search with Nash bargaining, and competitive search. In the first, sellers are unable to commit to a price for their homes and the price is the outcome of a Nash bargain over the surplus value from the match between the buyer and seller. In the second, sellers are able to commit to a price. When more buyers enter the market, the share of the match surplus going to the seller rises, leading to a larger increase in prices than in the random search model. I show that the model with competitive search is more likely conditional on the data than the model featuring random search and bargaining.

Historically, GDP, house prices, sales, and starts are positively correlated, while starts are negatively correlated with measures of market tightness such as months' supply of houses for sale. Simulated data from the model matches most of these patterns qualitatively, but misses the positive correlation between prices and starts.

I estimate the model's shock process using the Metropolis-Hastings algorithm and the historical shocks that have hit the housing market using the Kalman filter. I consider productivity shocks in the housing and consumption sectors, a shock to the fraction of eligible buyers in the housing market, and a news shock concerning future productivity in the consumption sector. Estimation results imply that the recent housing boom and bust were associated with a large increase and subsequent decrease in the pool of eligible buyers, in addition to expectations of higher future productivity that turned out not to be realized.

Chapter 2: Metropolitan Land Values and Housing Productivity, with David Albouy

We provide the first inter-metropolitan index of directly-observed land values that covers a large number of American metropolitan areas, using recent data from CoStar, a commercial real estate company. Together with data on housing values, land values allow us to estimate the cost relationship between housing and land and non-land costs using a dual approach. This approach also provides a new measure of local productivity in the housing sector, determined by the difference between the observed value of housing and the value predicted by land and other input costs. The housing productivity measure provides the most important indicator of a city's productivity in the non-tradeables sector, and can be contrasted with measures of productivity in the tradeables sector. Using recent measures by Gyourko, Saiz, and Summers (2008) and Saiz (2010), we are able to investigate how local housing productivity is influenced by artificial and natural constraints to development due to regulation and geography.

We find that, on average, 20 percent of housing costs are due to land: this share ranges from 0.15 to 0.27 in low to high-value areas, implying an elasticity of substitution between land and other inputs in production on average of about 0.94. Consistent estimation of these parameters requires controlling for regulatory and geographic constraints: a standard deviation increase in either of our basic constraint measures increases the cost of producing housing between 5 and 8 percent. We also examine the role of disaggregated measures of regulation and find that exactions, supply restrictions, and state and local court involvement predict the lowest productivity levels. Overall, housing productivity differences across metros are large, with a standard deviation of 19 percent of total costs, with a quarter of the variance explained by regulatory measures. Contrary to assumptions in the literature that productivity in tradeables and non-tradeables are the same, we find the two are negatively related, with productivity in housing decreasing, rather than increasing, in city size. Yet, we find, tentatively, that lower housing productivity due to land-use regulation is associated with a higher quality of life, enough to compensate local residents for higher housing costs.

Chapter 3: Price and Time to Sale Dynamics in the Housing Market: the Role of Incomplete Information

It is a stylized fact of the market for existing homes that there is a strong positive correlation between sales prices and sales volumes and that there is a strong negative correlation between sales prices and the average time houses are listed for sale (time on market). This paper offers a novel explanation for the stylized fact in which home sellers are not fully informed about conditions in the housing market, and face idiosyncratic variation in the offers they receive. Therefore, sellers face a signal extraction problem: when they receive a better than expected offer, they don't know if overall market conditions are favorable or if the idiosyncratic component of the offer is high. This problem leads sellers who receive better than expected offers to sell quickly and sellers who receive worse than expected offers to sell slowly, giving rise to the observed correlation between prices and time on market.

I also consider the interaction between sellers who have incomplete information about the state of the real estate market and realtors who have complete information the state of the market. I show that when, as appears to be the case in the data, there is misalignment between realtors' and sellers' incentives, the observed pattern will persist even in the presence of fully informed realtors.

I show that empirically, the correlation between sales volumes and house prices is stronger in "non-disclosure" states, where the purchase price of a house is not a matter of public record. This result is consistent with the idea that the correlation between prices and sales volumes stems partially from market participants having incomplete information about the state of the housing market.