Liquidity

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References

- Kelly and LeRoy, "Liquidity and Fire Sales" in Federal Reserve Board, Models I& Monetary Policy
- Kelly and LeRoy, "Liquidity and Liquidation", forthcoming, Economic Theory
- Chernobai, ”When Does Mobility Decrease Liquidity?”, reproduced, UCSB
Illiquidity: What is it?

- heterogeneity
- costly search
- indivisibility
- example: real estate
How the model works

- Agents buy and sell houses. If an agent currently is deriving services from a house, he has a match. The fit is constant over time equals $\epsilon$. Each period he keeps his match or loses it, according to a Markov chain. If he keeps his match he does nothing.

- If he loses his match he immediately offers his house for sale at a take-it-or leave it price $p$. One potential buyer per period evaluates the house. Draws fit $\epsilon$, evaluates the house, decides whether to buy. $\epsilon$ is IID on $[0,1]$. The seller doesn’t know buyer’s $\epsilon$, but does not its distribution, so he can calculate probability of sale for each $p$. 
If the current buyer doesn’t buy, the buyer keeps the house empty and tries again next period. No rental market.

All agents are risk neutral, so the potential buyer computes expected present value of future housing services, factors in the value of the house when he loses his match, computes a reservation fit.

The seller computes $p$ by balancing the obvious benefits of a high price against the lower probability of sale.
▶ In K-L agent cannot offer his house for sale if he has a match (analogous to a worker being able to search only when unemployed

▶ An agent may own any number of houses. In K-L no financing constraint

▶ Houses and agents are homogeneous and agents are risk-neutral, so $p$ is the same for all houses, agents, time
Measures of Illiquidity

- Can distinguish the “wholesale” price \( p \) and “retail” price \( q \) of a house. \( q \) is the value of a house without a fit. \( q \), like \( p \), is the same for all agents. \( q \) is the price of a perfectly liquid asset, so \( q/p \) is a measure of illiquidity.

- Another measure of illiquidity: expected time to sale.
How do you vary liquidity? Easiest way: vary the length of the period

(1) change the discount factor. Near 1 means the period is short (a day)

(2) also, you have to change the Markov process for losing the fit (probability of keeping fit near 1 means the period is short
Things work out as expected

- High liquidity: sellers set price high, so the probability of sale is low. That’s okay because another buyer will be along shortly.
- However, in this case the expected time to sale is short, as expected.
- In highly liquid markets both $q$ and $p$ are high (because vacancy is low).
- However, $q/p$ is only slightly lower than 1.
LeRoy-Kelly (ET): allow agents to sell their houses at any time. Assume the fit is a random walk.

LeRoy-Kelly (FRB Volume): Assume house sales are financed by defaultable mortgage. Timing is such that upon losing his fit, the seller has one chance to sell the house before the mortgage payment is due. If he fails to sell, he defaults.

Chernobai. considers two classes of buyers with different probabilities of losing their fit.

Krainer (JUE) Assume that the fit has a component that is common to all agents. It follow a two-state Markov chain. “hot markets”
Empirical study of illiquid markets

- These models look different from what we see. In hot markets properties sell fast, often for prices that are above listing prices.
- What happens in a market break? Realtors: markets dry up because sellers irrationally keep prices high.
- These stories are consistent with models only if agents don’t know they are in a hot or cold market. Similar to Lucas-style business cycle models. Subject to the same objection”.
- Krainer: you would expect hot markets to be more liquid than cold markets. Reason: if prices are high, cost of vacancy is high, so agents prices houses to sell faster.
Calibration

- As they stand, these models don’t lend themselves well to calibration. In K-L all houses sell for the same price.
- Project: Assume the value of a house has a component that is common across individuals (Montecito mansion vs. Goleta tract house).
- Assume that the common component varies over time, as with Krainer.
In this setting, assume the distribution of house fits and house prices is self-reproducing via “law of large numbers”, conditional on aggregate variables.

Study real-world housing markets. Get data (from SB?), estimate these distributions.