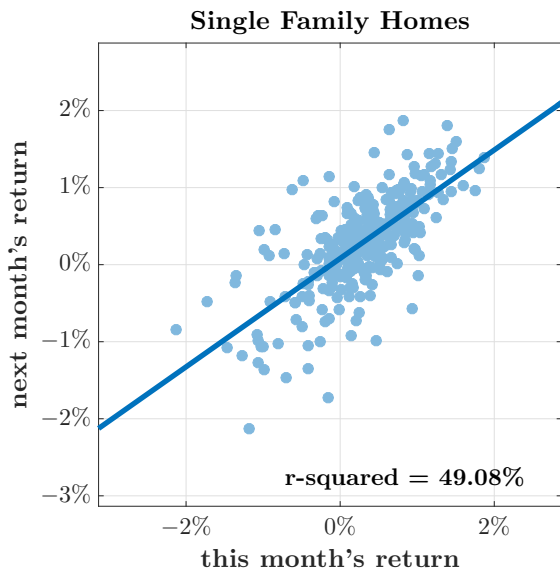


Constrained Asset Prices

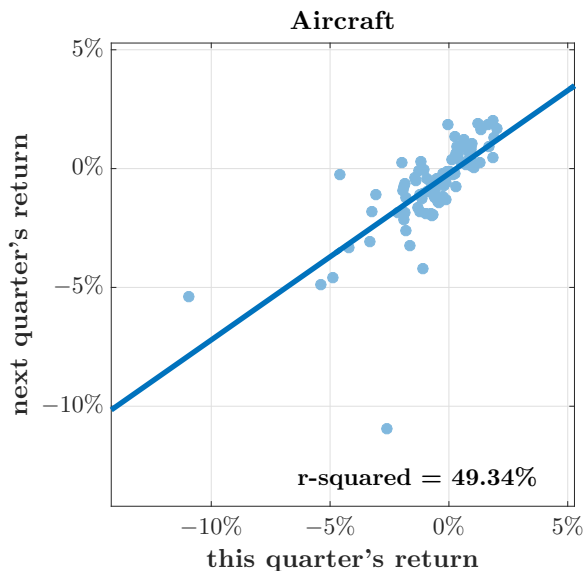
Jordan Martel and Edward Van Wesep



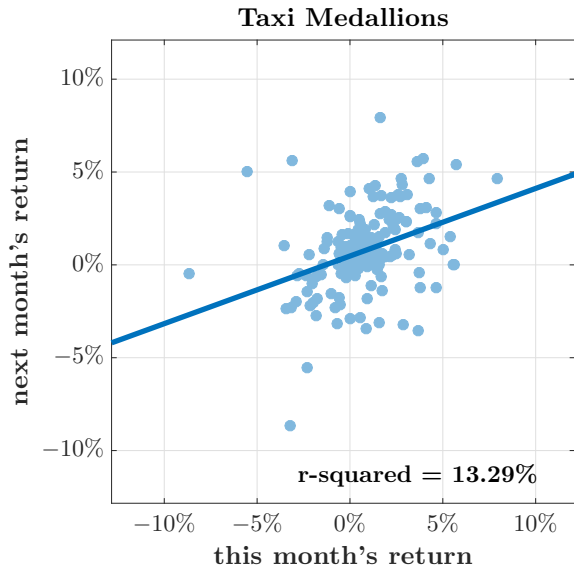
returns in residential real estate are autocorrelated



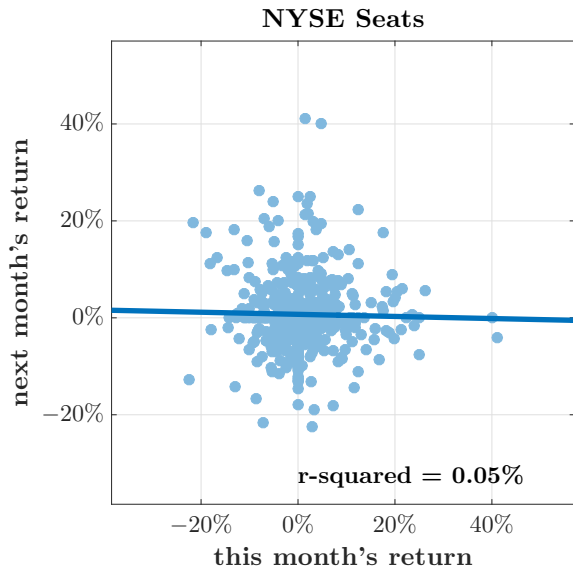
the same is true for aircraft...



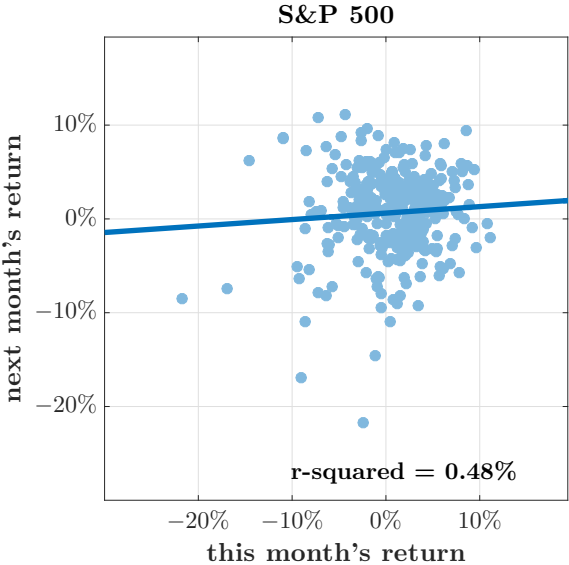
...and NYC taxi medallions.



returns for NYSE seats aren't autocorrelated...



...and neither are returns on the S&P 500



constrained asset prices

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- ▶ The “constrained asset price” is a dynamic price control.
- ▶ **Implication:** buyers are rationed when the price is rising; sellers are rationed when the price is falling.
- ▶ When buyers are rationed, we call it a *sellers’ market*; when sellers are rationed, we call it a *buyers’ market*.

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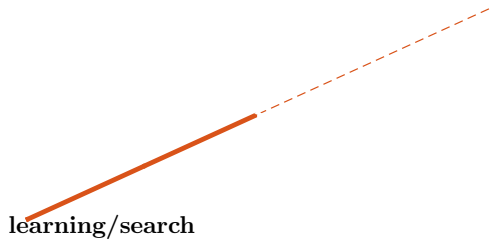
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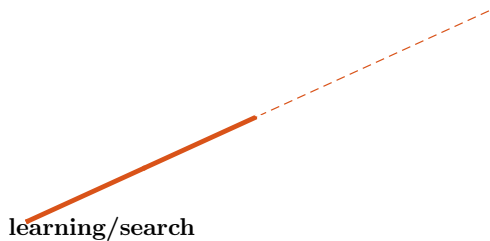
- ▶ Incentive to **ask higher** in falling market.

contribution

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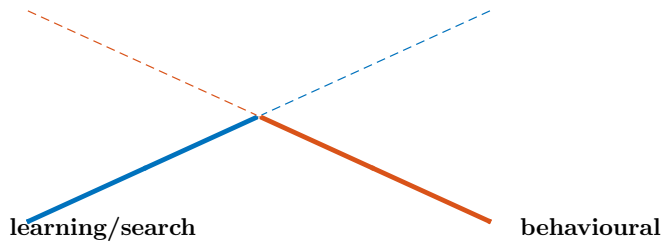


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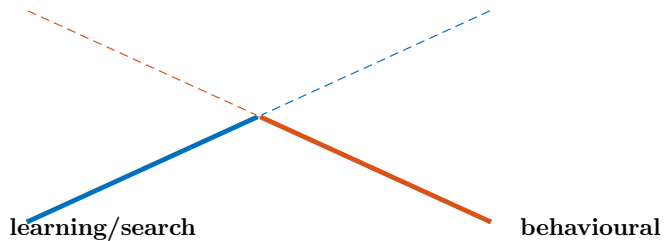


Guren (2016), Anenberg (2016), Head et al. (2014)

contribution

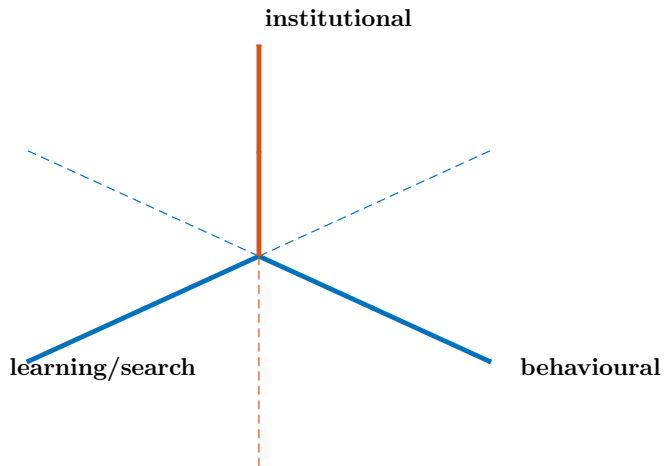


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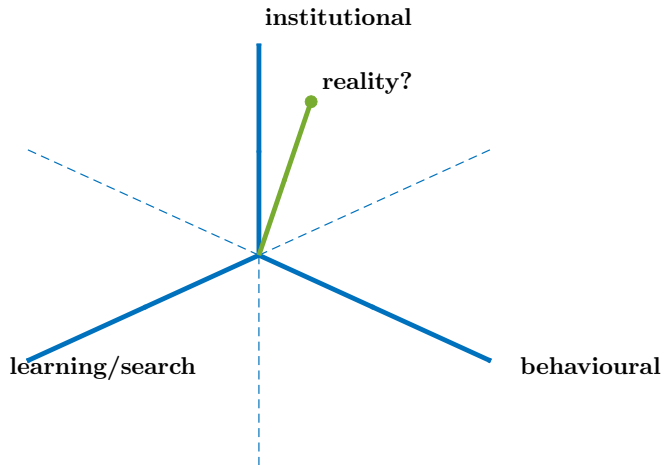


Glaeser and Nathanson (2015), Barberis et al. (2016)

contribution



contribution



the model



- ▶ There is an asset in unit supply for which agents have unit demand.
- ▶ Examples: a house, an airplane, a machine, a license, etc.
- ▶ There are more agents than assets.
- ▶ Agents are either “owners” or “non-owners.”
- ▶ Agents have heterogenous valuations for the asset.
- ▶ We induce trading by randomly shocking each agent’s valuation.

Exogenous Trading

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- ▶ **Main Assumption:** Appraiser can choose a price $p(t)$ such that

$$\underline{L} \cdot \bar{p}(t) \leq p(t) \leq \bar{L} \cdot \bar{p}(t) \quad (5)$$

where $\underline{L} < 1 < \bar{L}$. E.g., $\underline{L} = 90\%$ and $\bar{L} = 110\%$.

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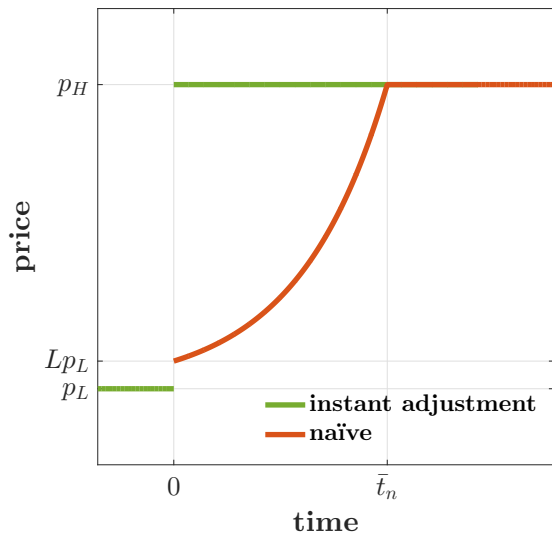
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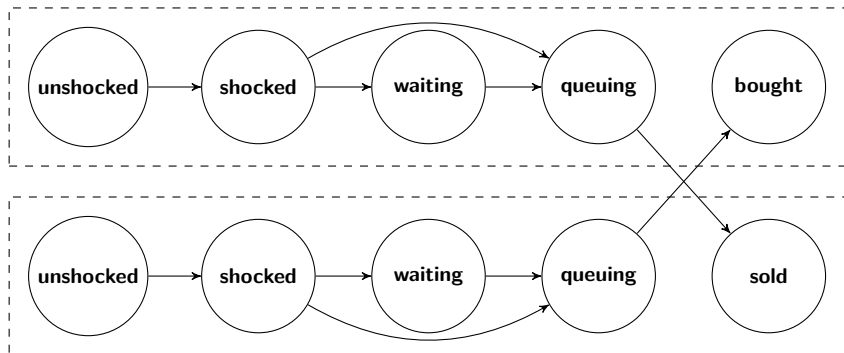


sophisticated agents

- ▶ Agents take price appreciation/depreciation into account.
- ▶ The model features
 1. **Flippers/Speculators**: they are not natural owners; they jump-in for the price appreciation.
 2. **“Housing Lock”**: again, they are not the natural owners; there aren't enough buyers.
 3. **Buyers'/Sellers' Markets**: agents are rationed because the price is constrained.
 4. **Slower Adjustment**: it always takes longer for the price to adjust when agents take price appreciation/depreciation into account.

queuing

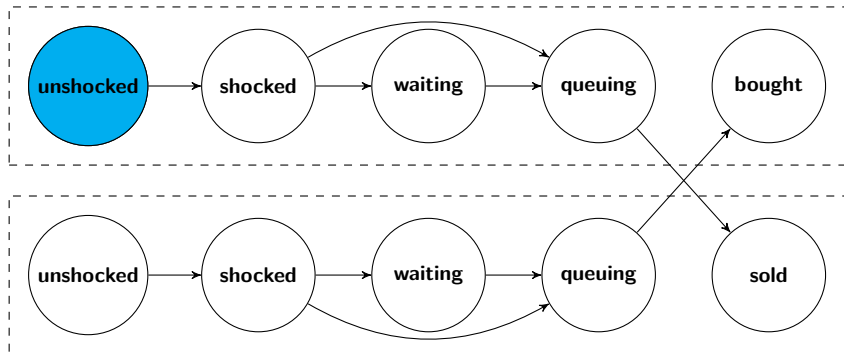
owners (e.g. homeowners)



non-owners (e.g. out-of-towners)

queuing

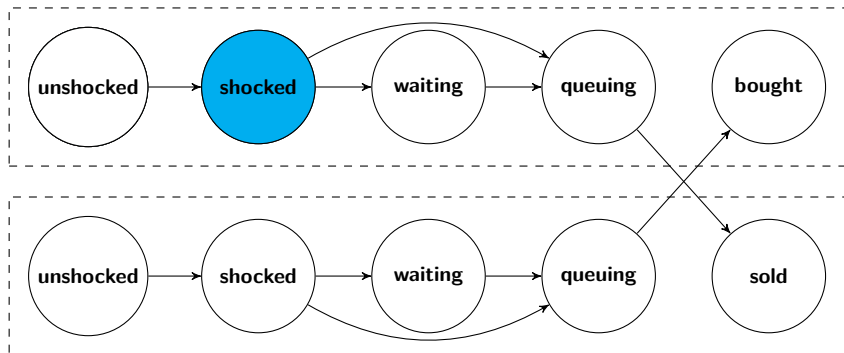
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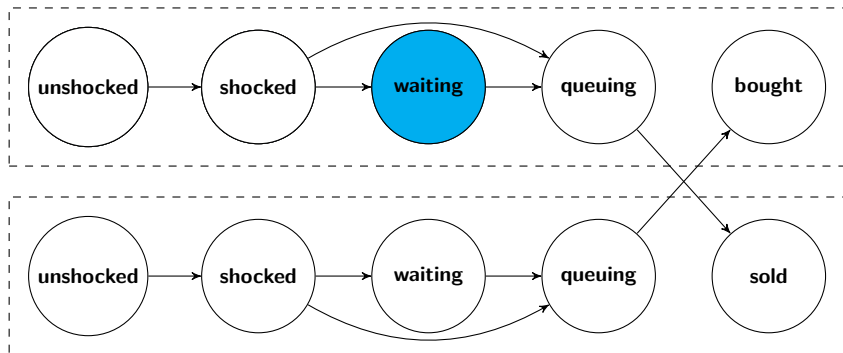
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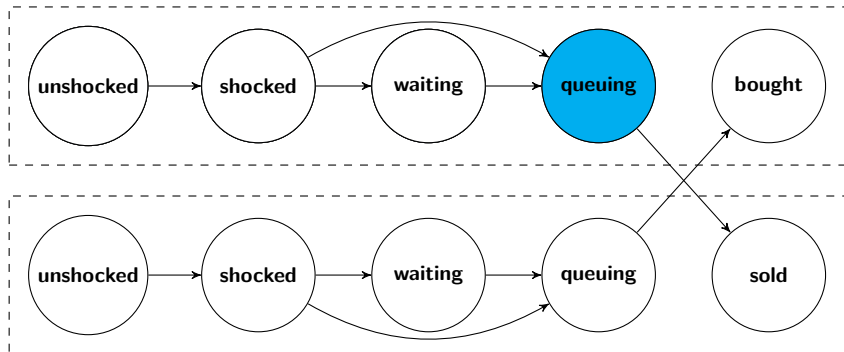
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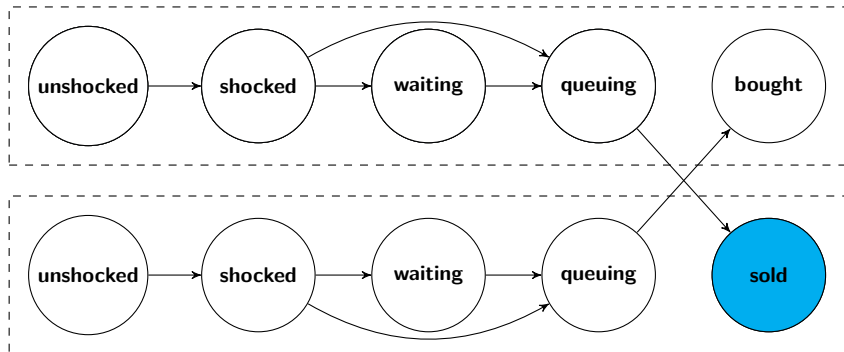
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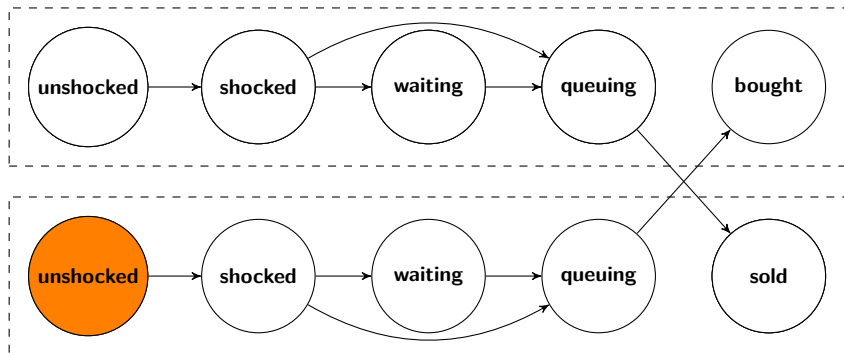
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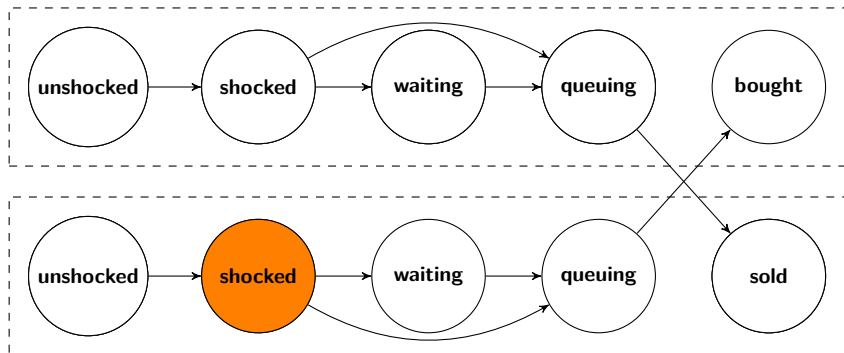
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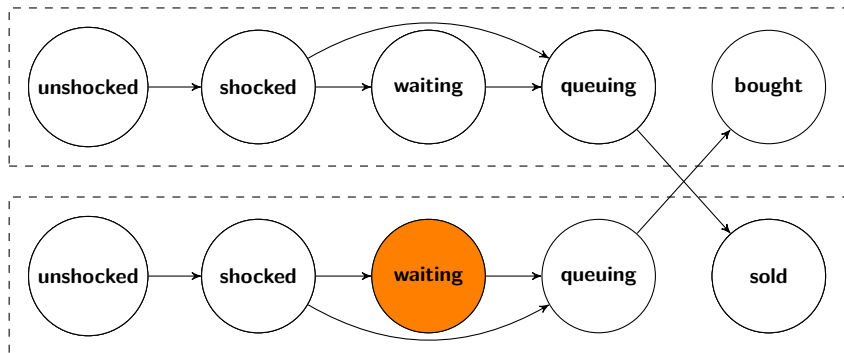
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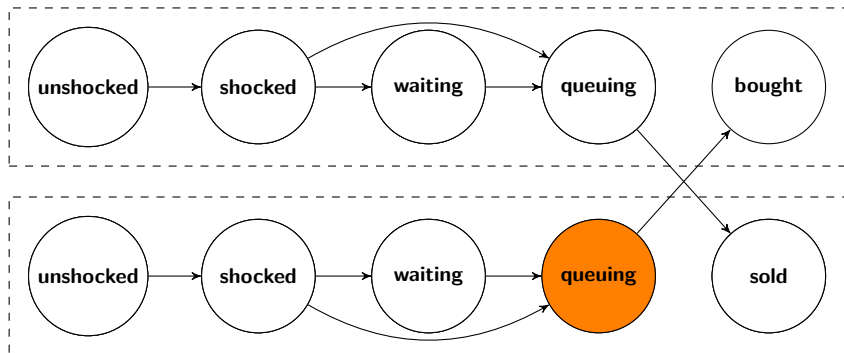
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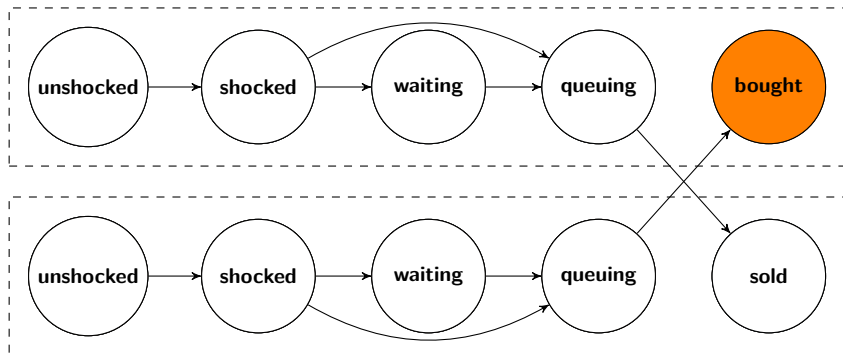
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sophisticated agents

- ▶ *If demand exceeds supply at the constrained price, then buyers queue; if supply exceeds demand, then sellers queue.*
- ▶ Queues evolve according to first-in-first-out (FIFO).
- ▶ Agents account for queueing times.
- ▶ The **owner's problem** is to choose a **time to queue to sell**;
- ▶ the **non-owner's problem** is to choose a **time to queue to buy**:

$$\text{owner's value} = \max_{t_{\text{sell}}} \int_{t_{\text{now}}}^{t_{\text{sell}}} \text{utility} + p(t_{\text{sell}}) + \text{non-owner's value} \quad (6)$$

$$\text{non-owner's value} = \max_{t_{\text{buy}}} -p(t_{\text{buy}}) + \text{owner's value} \quad (7)$$

a positive shock: from p_L to p_H

Definition (equilibrium)

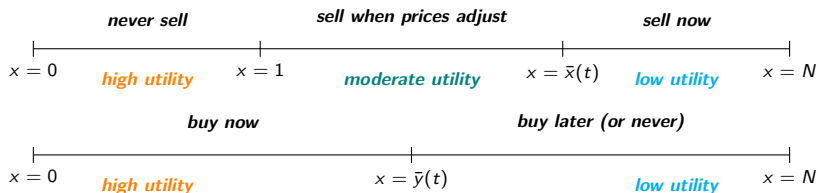
a price path, and a buyers' wait time such that

$$p(t) = \bar{L} \times \frac{1}{C} \int_{\tau(t)}^t p(s) \phi(s, p(s)) ds. \quad (8)$$

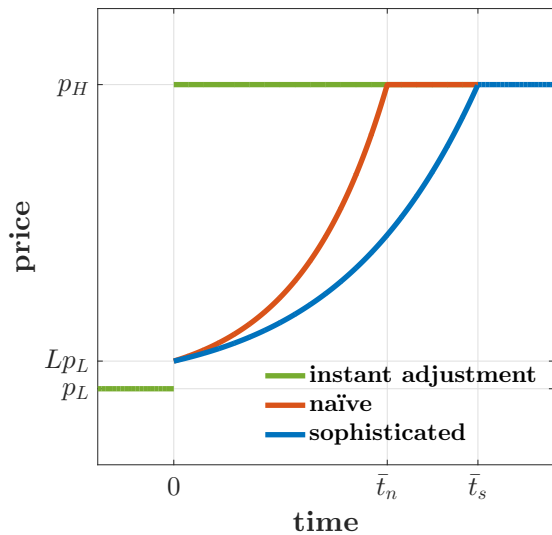
as long as $p(t) \leq p_H$.

Proposition (positive shock)

There is an equilibrium in which owners' and non-owners' strategies are



a positive shock: from p_L to p_H



a negative shock: from p_H to p_L

Definition (equilibrium)

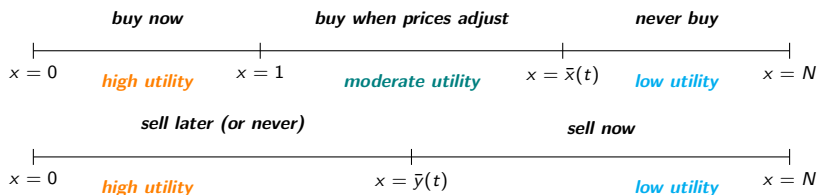
a price path, and a sellers' wait time such that

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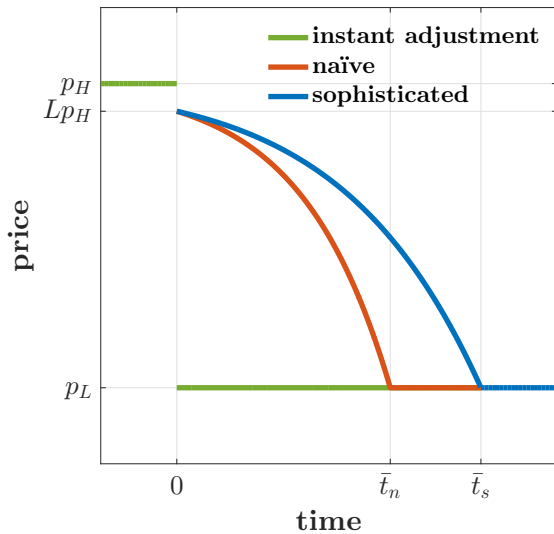
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Proposition (negative shock)

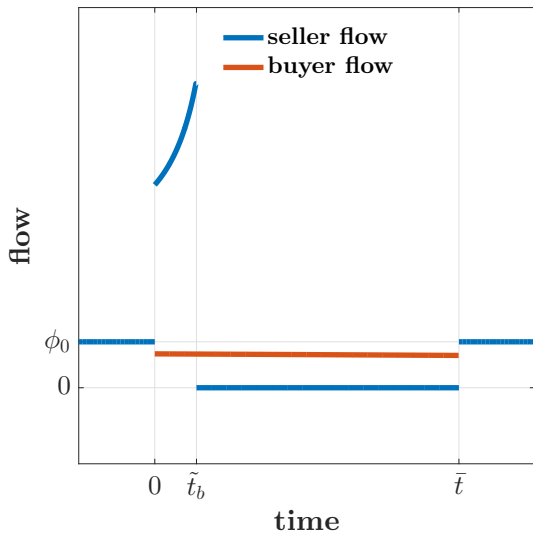
There is an equilibrium in which non-owners' and owners' strategies are



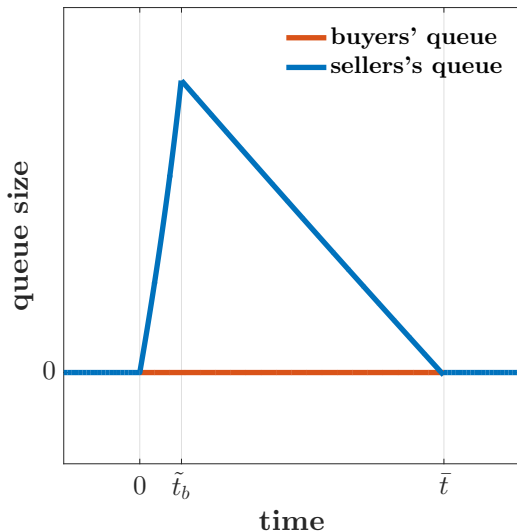
a negative shock: from p_H to p_L



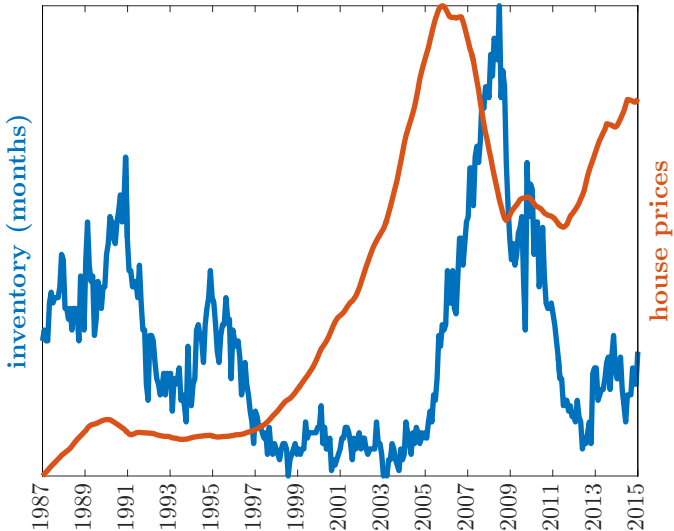
flows for a negative shock: from p_H to p_L



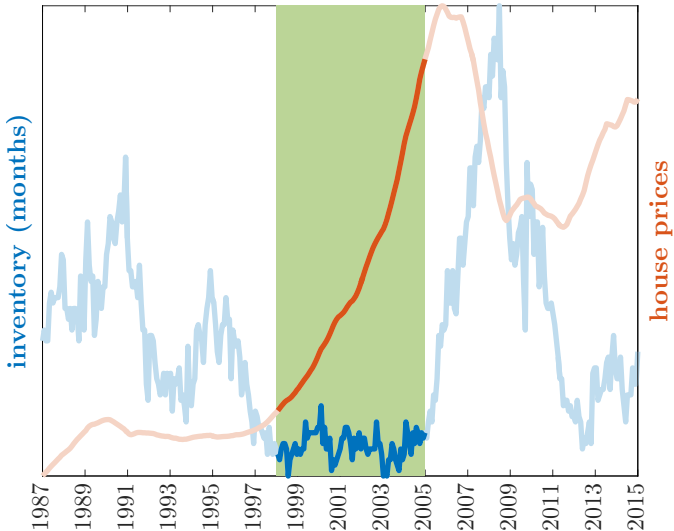
queues for a negative shock: from p_H to p_L



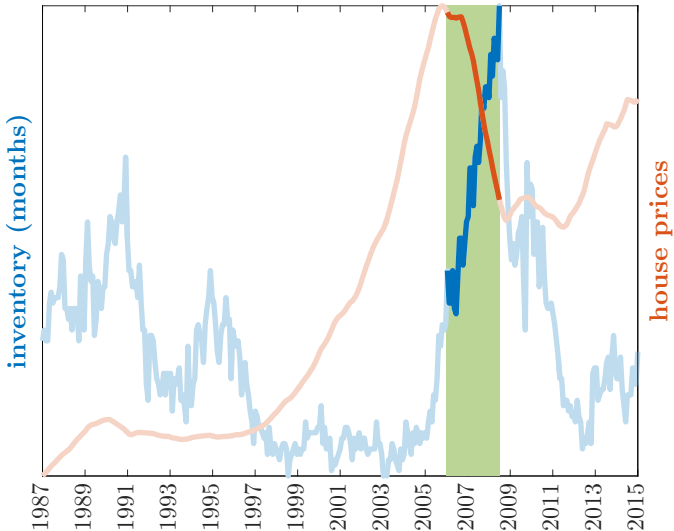
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References

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