



Andreas Krause

Trading with informed investors

Outline

■ Informed traders

■ Market efficiency

■ Market liquidity

■ Summary

■ Informed traders

■ Market efficiency

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■ Summary

Informed traders
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Market efficiency
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Market liquidity
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Summary
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Traders in the market

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- ▶ A number of traders receive **information** about the future value of an asset

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Market efficiency
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Summary
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Price determination

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- ▶ **Prices** are set such that it reflects the **value** based the information from the total demand over time demand of the **informed traders** and **noise traders**
- ▶ $P_t = E \left[V | \sum_{\tau=1}^N Q_{\tau} + \sum_{\tau=1}^M U_{\tau} \right]$

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Informed traders
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Market efficiency
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Market liquidity
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Summary
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Order determination for informed traders

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- ▶ Profits from a trade arise from the difference between the **asset value** and the **price** paid
- ▶ $\Pi_t^i = (V - P_t)$

Order determination for informed traders

- ▶ Profits from a trade arise from the difference between the **asset value** and the **price** paid, for **each asset traded**
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Order determination for informed traders

- ▶ Profits from a trade arise from the difference between the **asset value** and the **price** paid, for **each asset traded**, plus any **future profits** the traders will receive
- ▶ $\Pi_t^i = (V - P_t) Q_t^i + \Pi_{t+1}^i$

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- ▶ We assume that orders are linear in the value of the asset
- ▶ $Q_t^i = \alpha_t + \beta_t V$
- ▶ We assume that profits are quadratic in the difference between the value and price of the asset
- ▶ $\Pi_t^i = \delta_t + \gamma_t (V - P_t)^2$

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Solution of the model

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- ▶ Informed investors will **maximize their profits** by choosing an optimal order size for each time period until the information is revealed publicly

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$$\lambda_t = \frac{N\beta_t\sigma_{t-1}^2}{N^2\beta_t^2\sigma_{t-1}^2 + t\sigma_U^2}$$

$$\beta_t = \frac{1-2\gamma_t\lambda_t}{\lambda_t(1+N(1-\gamma_t\lambda_t))}$$

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Informed traders
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Market efficiency
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Market liquidity
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Summary
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Measuring market efficiency

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- ▶ If the variance on observing the price does not reduce, $\sigma_t^2 = \sigma_0^2$, the market is inefficient
- ▶ If the variance on observing the price is zero, $\sigma_t^2 = 0$, the market is **perfectly efficient**

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Informed traders
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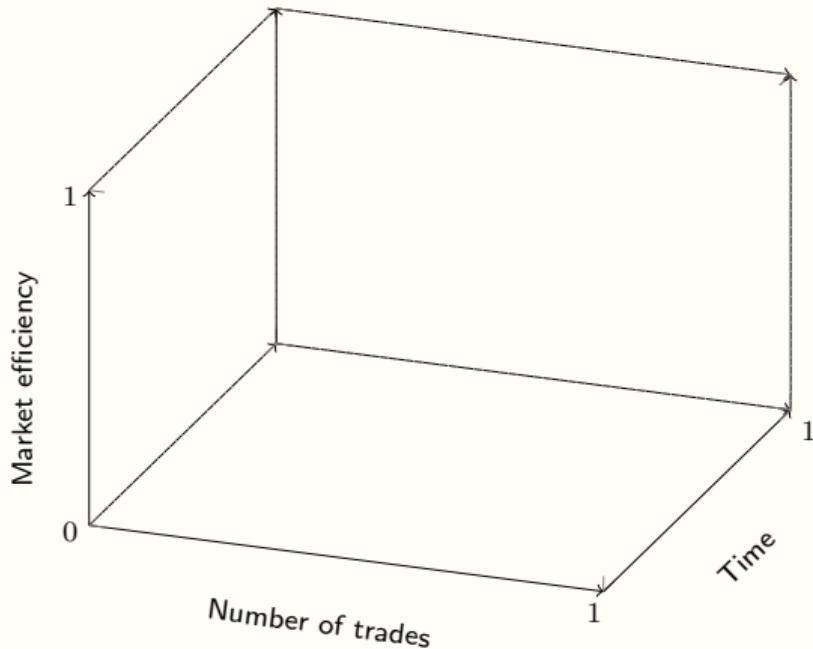
Market efficiency
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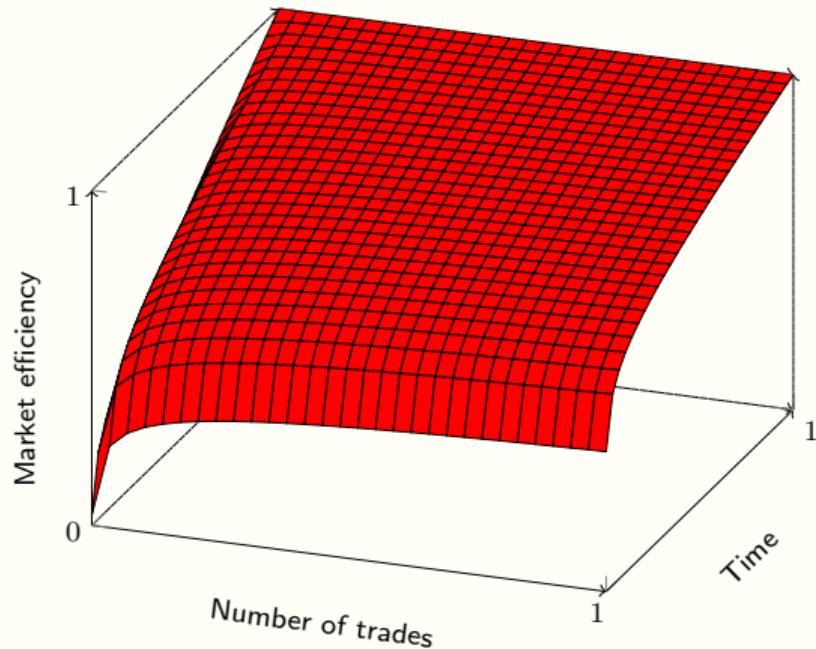
Market efficiency

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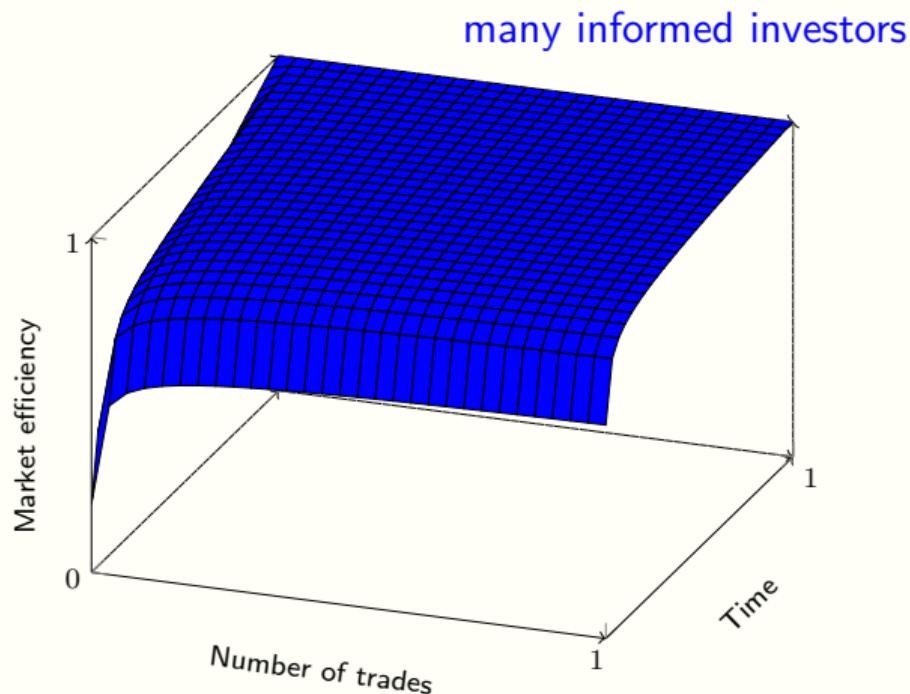


Market efficiency

Few informed investors

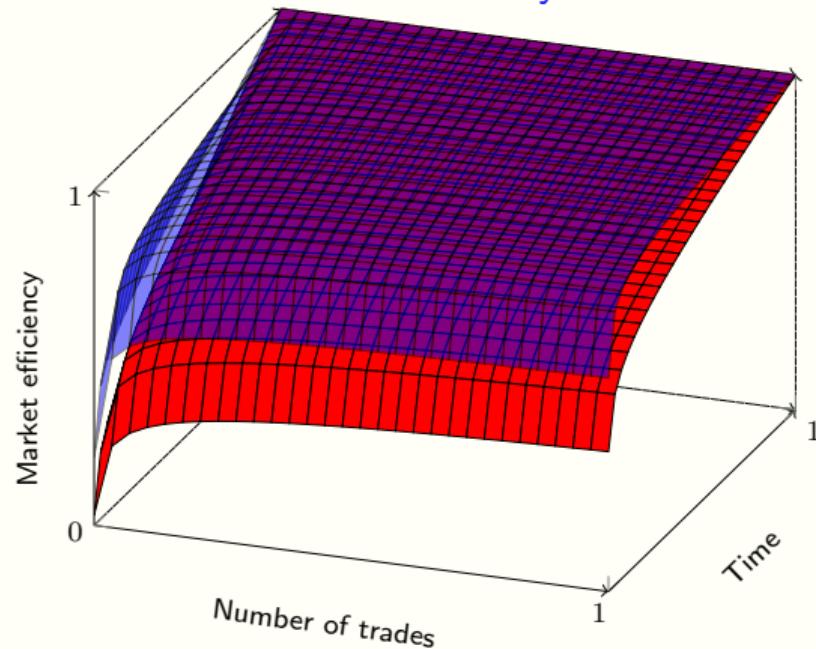


Market efficiency



Market efficiency

Few informed investors and many informed investors



Informed traders
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Market efficiency
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Market liquidity
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Summary
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Market efficiency develops over time

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- ▶ Markets become efficient **over time** as information is incorporated into prices

Market efficiency develops over time

- ▶ Markets become efficient over time as information is incorporated into prices with **each trade** informed traders conduct

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- ▶ Markets become efficient over time as information is incorporated into prices with each trade informed traders conduct
- ▶ Informed investors trade **strategically**

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- ▶ Informed investors trade strategically and **hide their trades** among the random trades of noise traders

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- ▶ The larger the demand, the **less likely** it is from noise traders

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- ▶ This **reduces the profits** of informed traders

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- ▶ This reduces the profits of informed traders and they will submit **smaller orders**

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Market liquidity
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Summary
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More frequent trading increases market efficiency

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- ▶ If informed investors can **trade more frequently**, the market will be **more efficient more quickly**

More frequent trading increases market efficiency

- ▶ If informed investors can trade more frequently, the market will be more efficient more quickly
- ▶ With **more frequent trades**, there is **more information** available at any time

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- ▶ With more frequent trades, there is more information available at any time and the market incorporates this information more quickly into the price
- ▶ Informed traders will **spread their trades** over time optimally

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- ▶ Informed traders will spread their trades over time optimally, but at any given point of time will **trade more**

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Summary
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More informed traders increases market efficiency

More informed traders increases market efficiency

- ▶ Informed traders obtain an **informational advantage** over noise traders

More informed traders increases market efficiency

- ▶ Informed traders obtain an informational advantage over noise traders and will exploit this advantage like an **oligopoly**

More informed traders increases market efficiency

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- ▶ The **more informed traders** are in the market, the more they will **compete** with each other

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- ▶ Informed traders obtain an informational advantage over noise traders and will exploit this advantage like an oligopoly
- ▶ The more informed traders are in the market, the more they will compete with each other
- ▶ This competition leads to traders submitting **larger orders** to obtain more profits now

More informed traders increases market efficiency

- ▶ Informed traders obtain an informational advantage over noise traders and will exploit this advantage like an oligopoly
- ▶ The more informed traders are in the market, the more they will compete with each other
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- ▶ The more informed traders are in the market, the more they will compete with each other
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- ▶ Submitting larger orders now implies that the observed demand is **more likely** to come from informed traders

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- ▶ Submitting larger orders now implies that the observed demand is more likely to come from informed traders, **revealing information**

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- ▶ This competition leads to traders submitting larger orders to obtain more profits now, given that other traders can reduce future profits by submitting larger order now
- ▶ Submitting larger orders now implies that the observed demand is more likely to come from informed traders, revealing information and **adjusting the price more**

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- ▶ Submitting larger orders now implies that the observed demand is more likely to come from informed traders, revealing information and adjusting the price more
- ▶ This also **reduces future profits** as the price adjusts more

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Informed traders
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Market efficiency
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Market liquidity
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Summary
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The impact of noise trading and asymmetric information

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Informed traders
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Market efficiency
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Market liquidity
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Summary
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■ Informed traders

■ Market efficiency

■ Market liquidity

■ Summary

Informed traders
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Market efficiency
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Market liquidity
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Summary
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Measuring liquidity

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Informed traders
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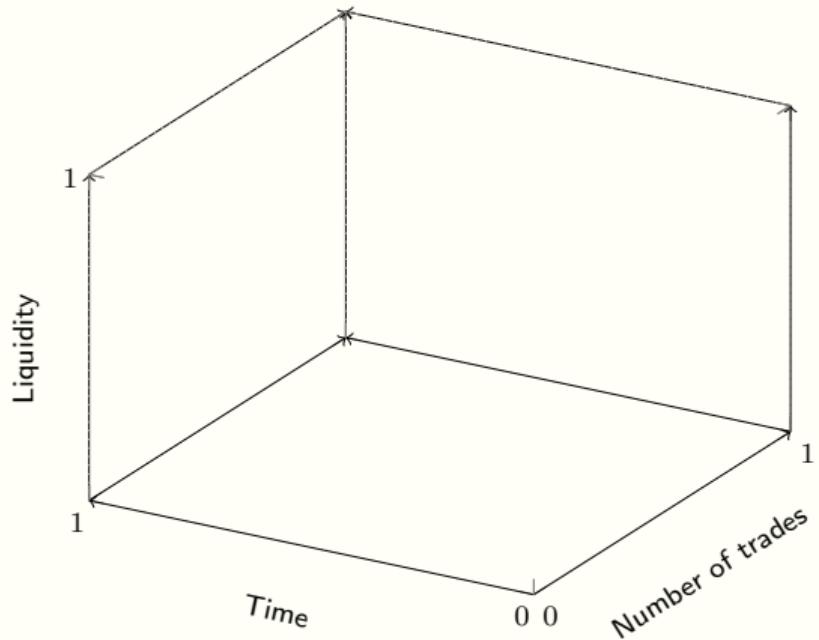
Market efficiency
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Market liquidity
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Summary
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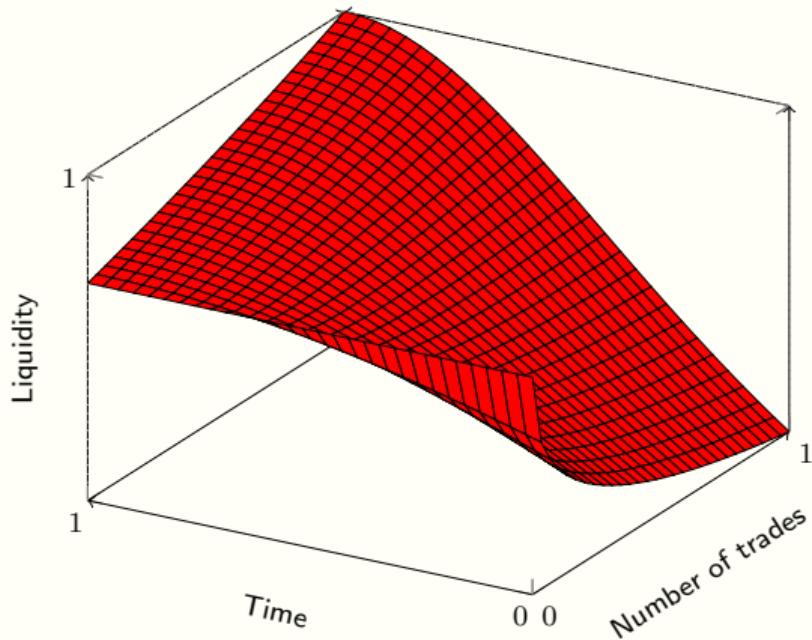
Market liquidity

Market liquidity

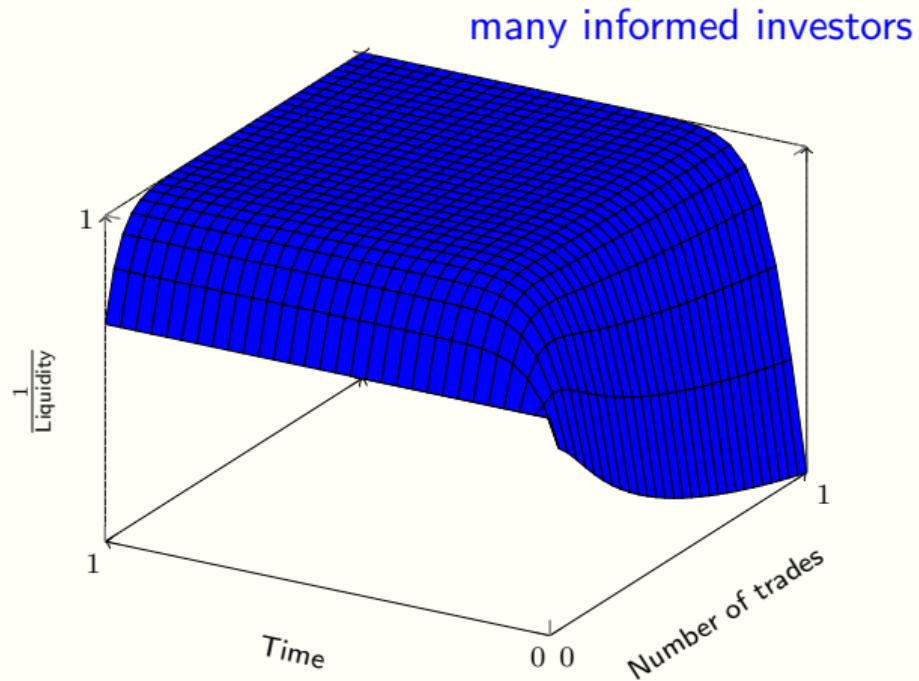


Market liquidity

Few informed investors

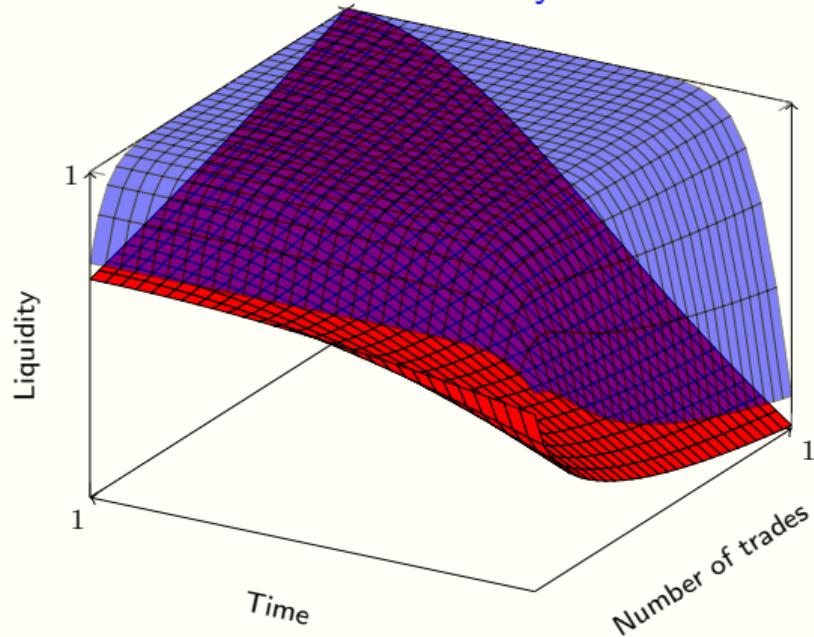


Market liquidity



Market liquidity

Few informed investors and many informed investors



Informed traders
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Market efficiency
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Market liquidity
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Summary
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Informed traders
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Market efficiency
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Market liquidity
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Summary
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Market liquidity
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Summary
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- ▶ **More competition** between informed traders increases informed trading and reduces liquidity

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Market efficiency
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Market liquidity
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Summary
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■ Informed traders

■ Market efficiency

■ Market liquidity

■ Summary

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