

Dicussion of: *"Dealer Participation"*

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Context: Narrative of falling liquidity

There are many stories about lower liquidity in financial market and the underlying cause:

- Stricter capital requirements.
- Scaling back of banks' trading books.
- Volker rule restricts proprietary trading by banks.
- ETF and index funds have focused liquidity in some segments of the market.
- Fragmentation across platforms due to alternative trading systems.
- High Frequency Trading has led to more transactions, but liquidity that evaporates easily.
- Decline in dealer corporate bond inventories.

Context: Pictures of falling liquidity

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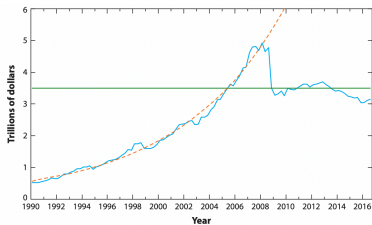


Figure 1

Dealers' assets. This figure plots the total financial assets of security broker/dealers at the subsidiary level. The orange dashed curve shows the computed exponential growth trend of the 1990–2008 period. The green line is set at \$3.5 trillion. Data are from the Financial Accounts of the United States published by the Board of Governors of the Federal Reserve System.

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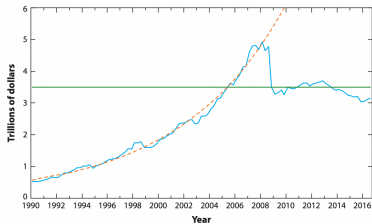


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Note that while it's potentially an important issue evidence is not clear that there is a generalized decline in liquidity.

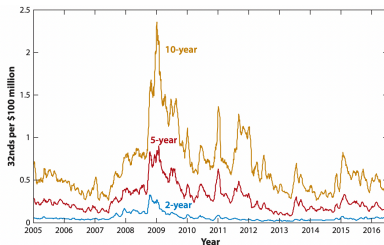


Figure 13

Price impact of US Treasury securities. This figure plots 4-week moving averages of slope coefficients from weekly regressions of 5-minute price changes (calculated using bid-ask midpoints) on 5-minute net order flow for on-the-run notes. Data are from BrokerTec.

Context: Existing modelling frameworks

There are various frameworks in the literature to think about liquidity:

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- Macroeconomics: Funding liquidity, aggregate factors
- Microstructure: participation rules, market design, tick size, transaction fees.

Model: Key premises

- Three periods, two assets, trade at date 1, pay-off at date 2.
- Risky asset prices is p , pay-off is $D \sim \bar{D}, \sigma^2$.
- End-user expected utility is $\frac{1}{\alpha} \log E[\exp - \alpha W_2^e]$, risk neutral dealers maximize W_2^d .
- An endowment that co-varies with the risk asset:
$$W_2^e = W^e + x_1^e(D - p) + z(D - \bar{D})$$
- Dealers income is $W_2^d = W^d + x_1^d * (D - p)$, but they are constrained by $k|x_1^d| \leq W^d$
- Mass of dealers is $N \in (0, \infty)$, mass of end-users is n .
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- Cost of participation c (contribution of this paper)

Model:

- End-users optimization problem is:

$$\max_{x_1^e} W^e + x_1^e(\bar{D} - p) - \frac{1}{2}\alpha\sigma^2(x_1^e + z)^2$$

- ...from which $x_1^e = \frac{\bar{D}-p}{\alpha\sigma^2} - z$

- And then, under market-clearing: $N\text{sgn}(\bar{D} - p)w = n \left(z - \frac{\bar{D}-p}{\alpha\sigma^2} \right)$

- Which then determines the price as:

$$p = \left\{ \begin{array}{ll} \bar{D} - \alpha\sigma^2(z + \frac{N}{n}w) & \text{if } z < -\frac{N}{n}w \\ \bar{D} & \text{if } |z| < -\frac{N}{n}w \\ \bar{D} - \alpha\sigma^2(z - \frac{N}{n}w) & \text{if } z > \frac{N}{n}w \end{array} \right\}.$$

In words...

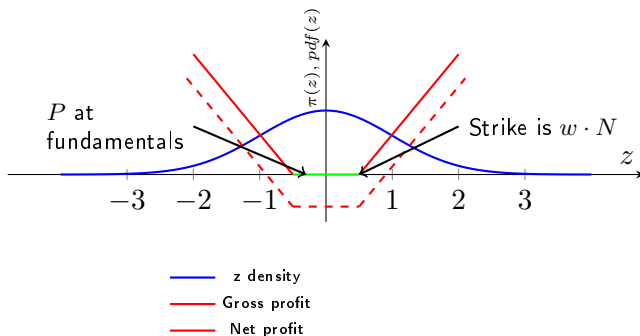
- Firms decide whether to set up shop (as a function of their expected returns relative to the cost of entry)
- The covariance of shocks and endowments is revealed.
- Prices are determined (as a result of demand and supply for liquidity)
- Endowments and asset prices are revealed.

So this is a model of:

- Agents that are looking to hedge their income.
- Intermediaries that sell their (scarce) risk-neutrality and risk-holding capacity.
- ...in exchange for expected returns on their portfolio.
- ...and that participate if $E[\pi] c$

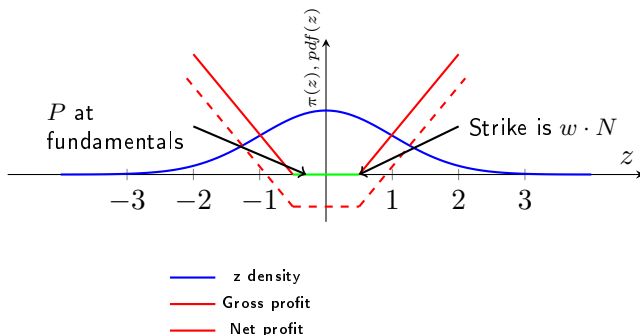
Model in Pictures

Liquidity shock, density and profits



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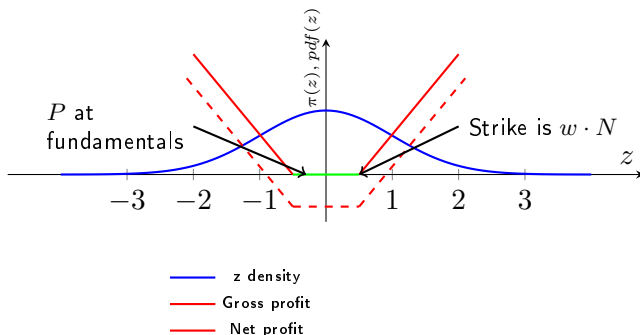
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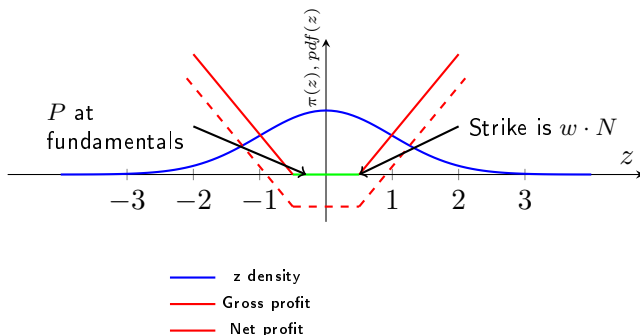
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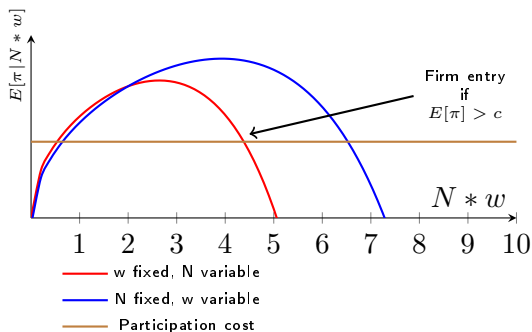
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- Liquidity providers buy a “strangle” option with strikes at $\pm w \cdot N$.
- Price is more “stable” for a larger $N \cdot w$.
- Note that naturally, the option is more variable when volatility is higher.

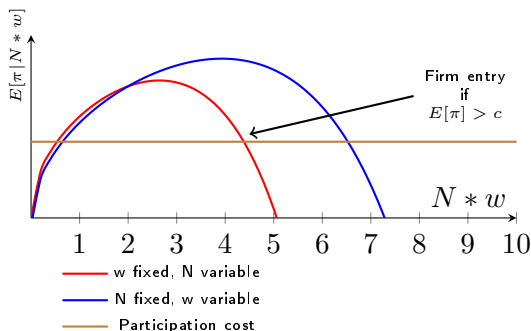
Model in Pictures 2

Expected profits per dealer



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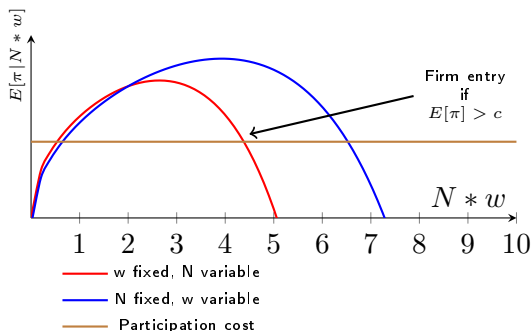
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Expected profits per dealer



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- Figuring out the equilibrium number of dealers and their choice of balance sheet ... $\implies$ very complicated.

Comments about model

- ONE MAIN COMMENT: Equilibrium is a highly complex object: participation, balance sheets, margins, profits, volatility, returns, realistically all depend on each other.

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- Maybe its simpler to write the model outright in terms of the value of a “strangle”.
- Balance-sheet choice is a complicated problem: recognize that the model is limited by assumption about w .
- The lack of risk aversion limits what the model can say about why these agents stay out of a market or leave after large shocks.

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- Tests of the model
 - Its very appealing that there are many facts that can be interpreted as being consistent with the theory.
 - But, a more streamlined, focused, well-connected description can help:
 - The ABSTRACT describes the findings as $N \implies \{R, \rho, \sigma\}$
 - The INTRO describes the findings as $N \implies \{R, \rho, \sigma\}$ and $BS \implies \{N, \rho\}$ and $\sigma \implies \{c, \mu\}$.
 - The MODEL describes the predictions as $BS \implies \{N, R, \sigma\}$ which implies $corr(N, R)$ and $corr(N, \sigma)$
 - The CONCLUSION describes the results as $N \implies \{R_1, R_2\}$, $\{\mu, W\} \implies \{N, \sigma\}$, $c \implies \{Vol/liquiditycurve\}$.
 - ONE MAIN COMMENT: Endogeneity: given how everything depends on everything else, it's key to look for causal evidence.

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- Calls attention to a useful fact: **the number of dealers in a market appears to be a key statistic associated with liquidity.**
- Thanks for the opportunity to discuss this paper!