# Money in the right hands

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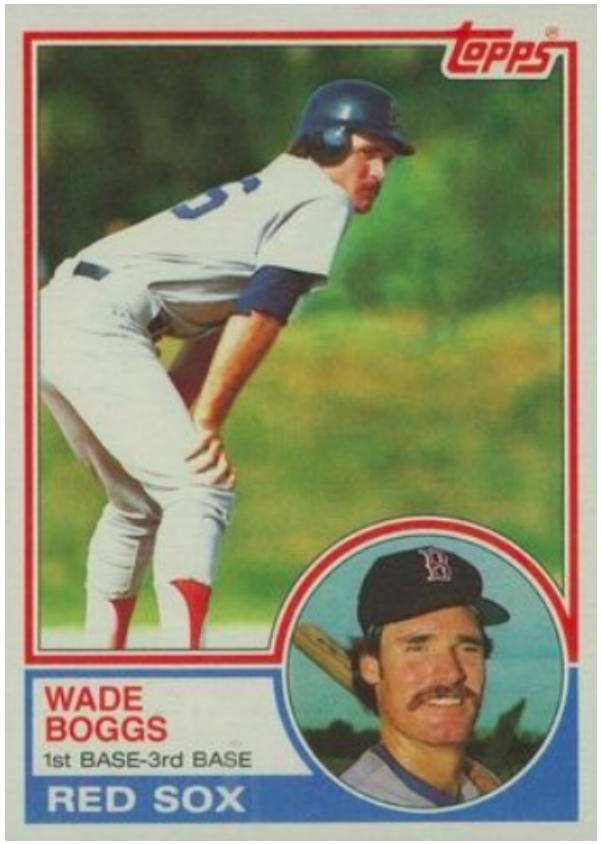

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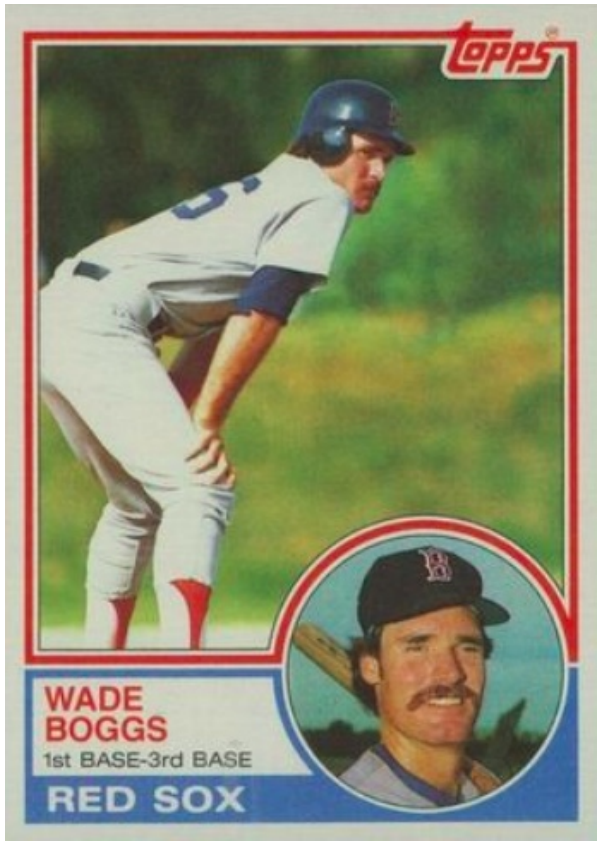


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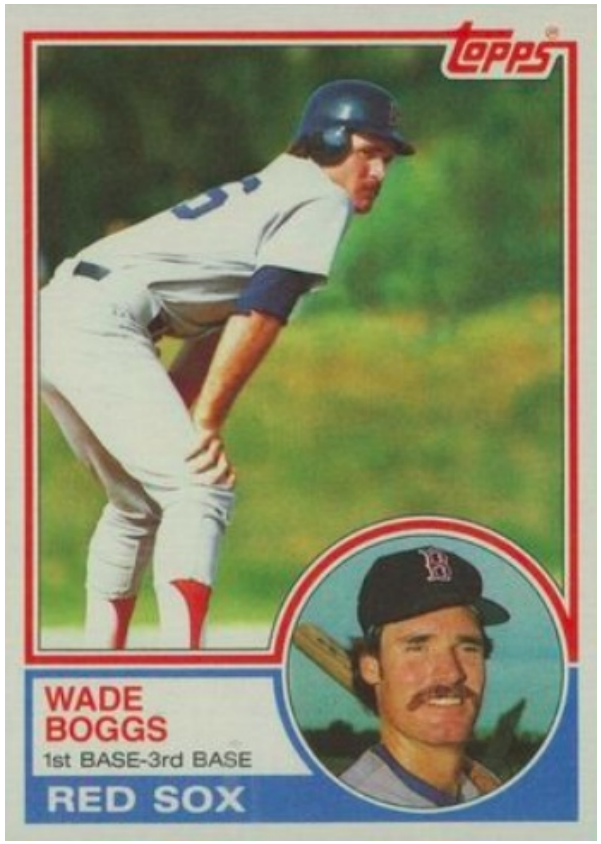


up to 2000$

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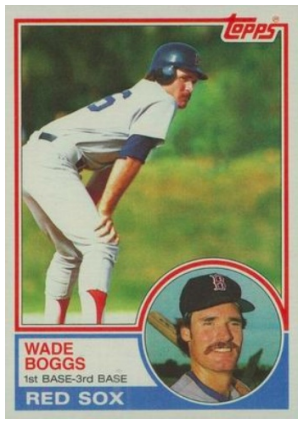

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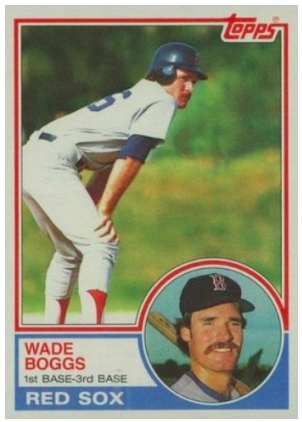


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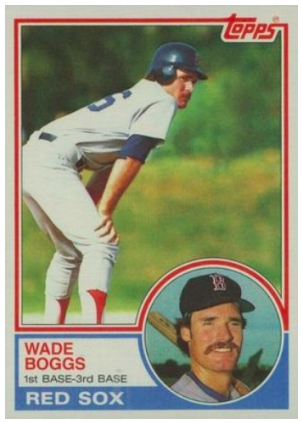


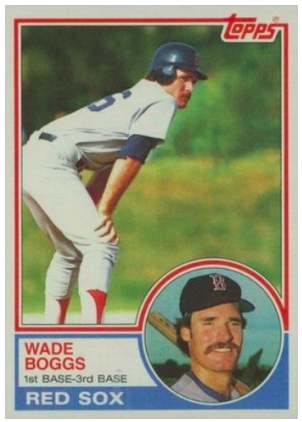


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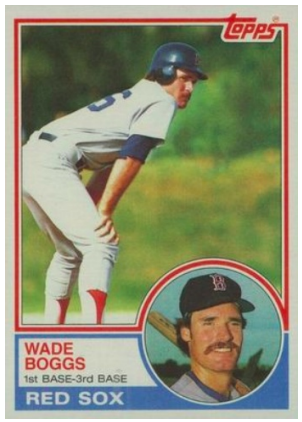


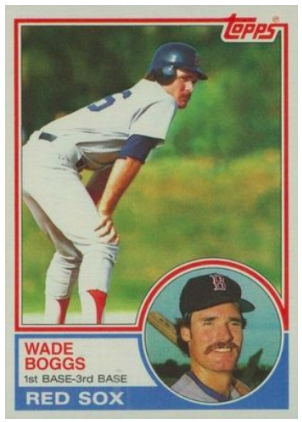


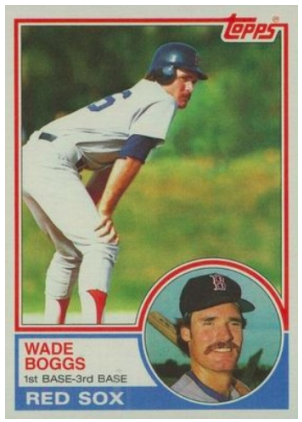


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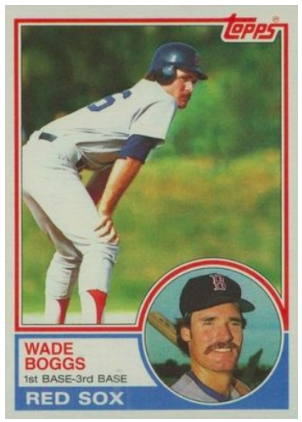


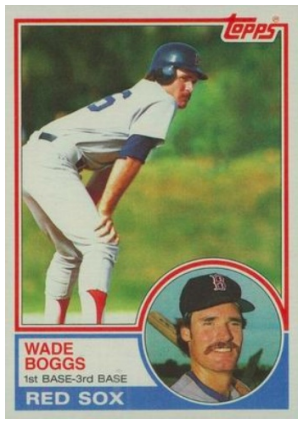


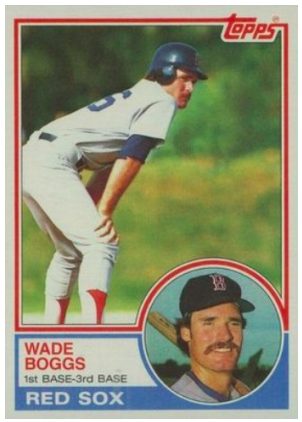


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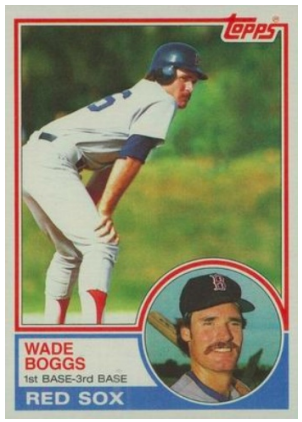


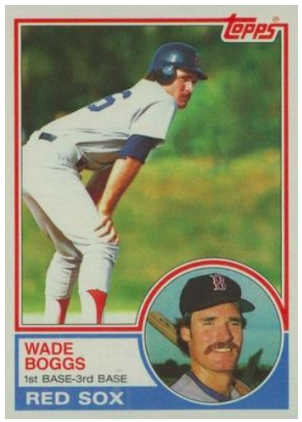


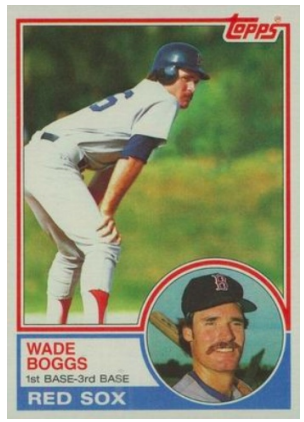


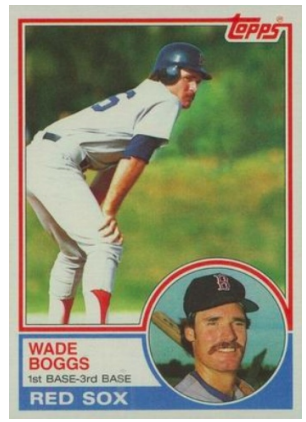


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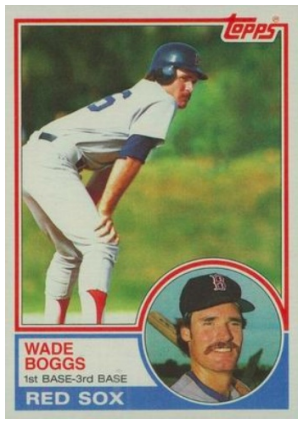


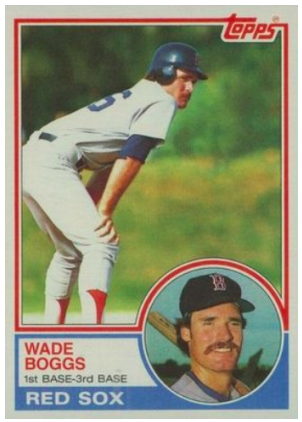


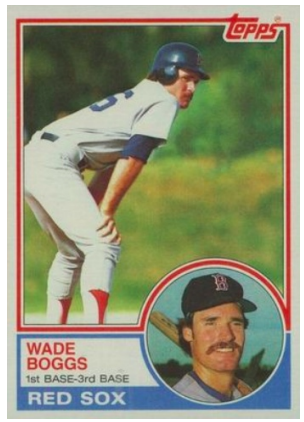


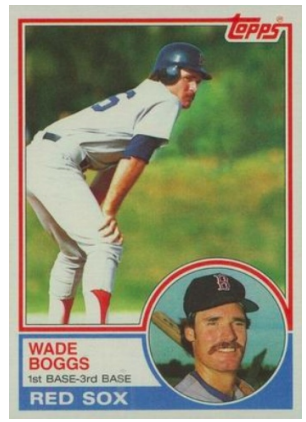


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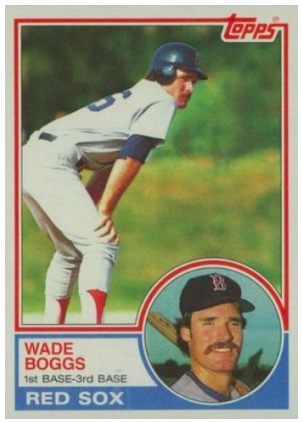

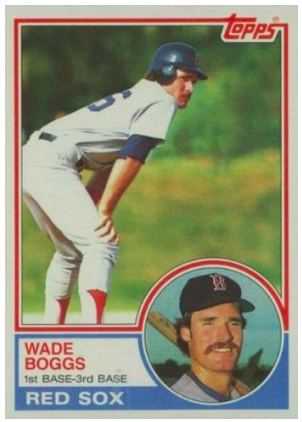

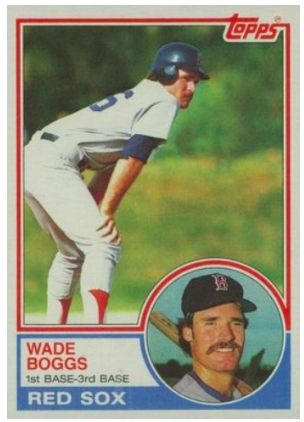

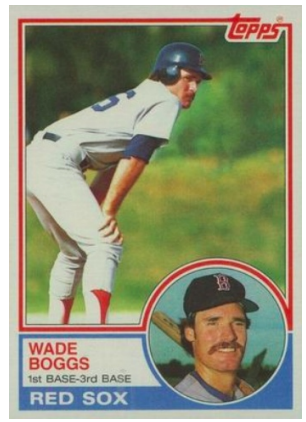


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Lack of specialized demand: asset liquidity dries up and prices fall.

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$$q_i(\text{pref}_i, \text{beliefs}_i | p) \overset{CRRA}{\approx} \frac{\ln \mu_{ij} + 0.5\sigma_{ij}^2}{\gamma_i \sigma_{ij}^2} - \frac{\ln p}{\gamma_i \sigma_{ij}^2}.$$

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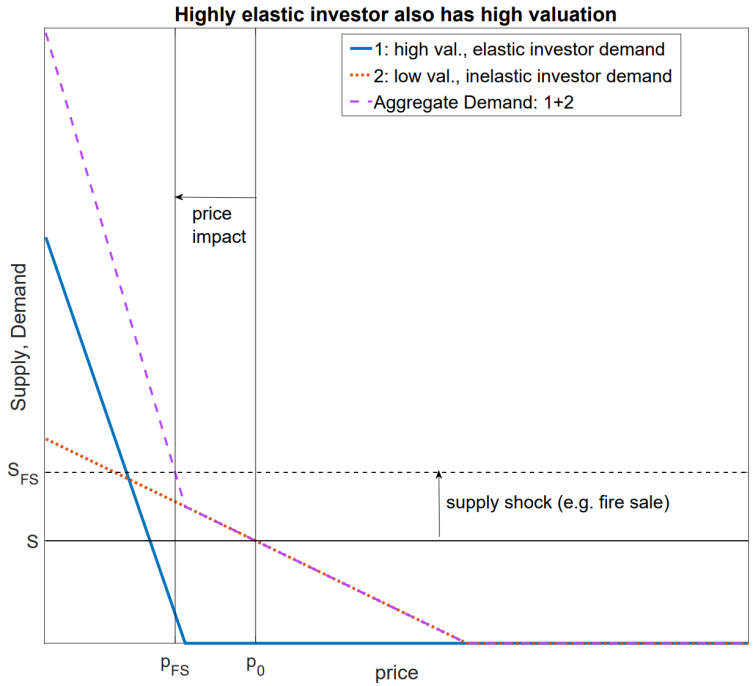
# Price impact: Comparative statics

- Both, elasticity and high valuations matter.



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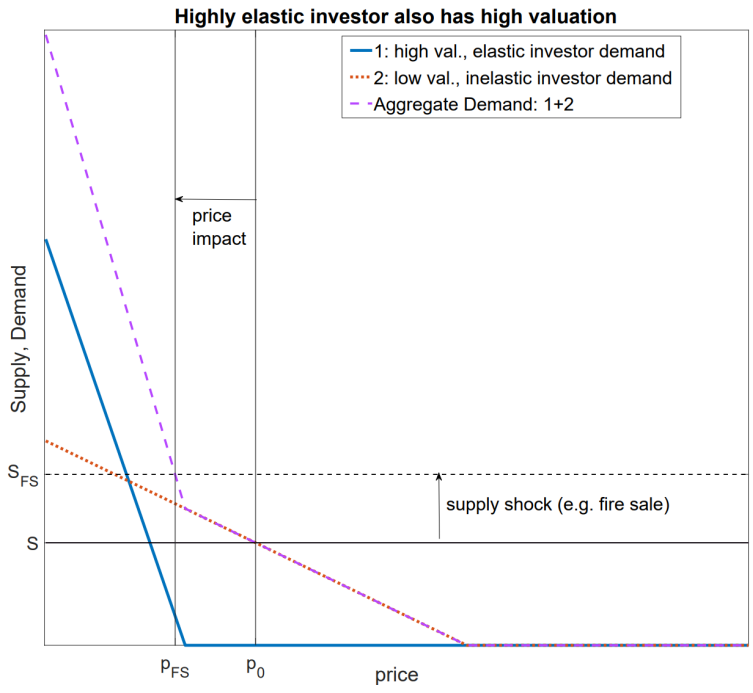


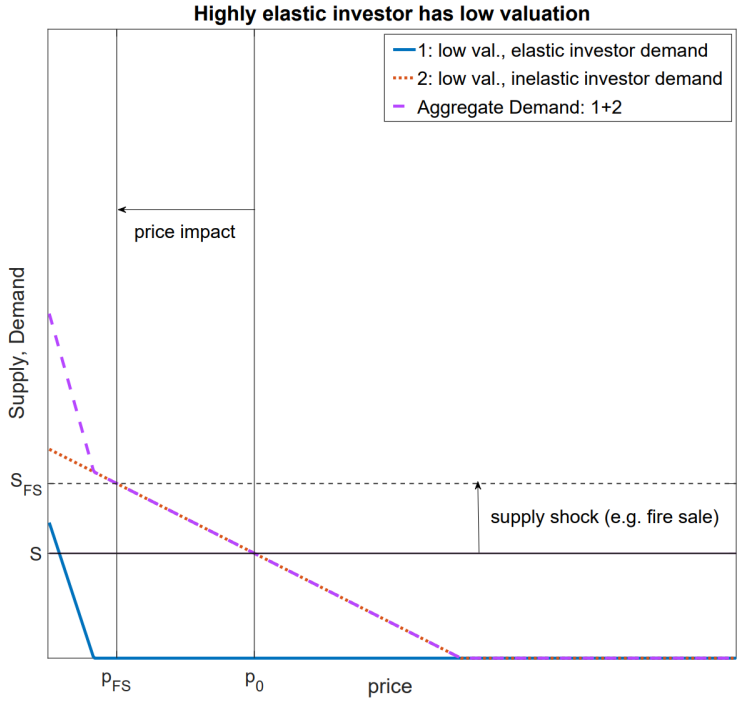

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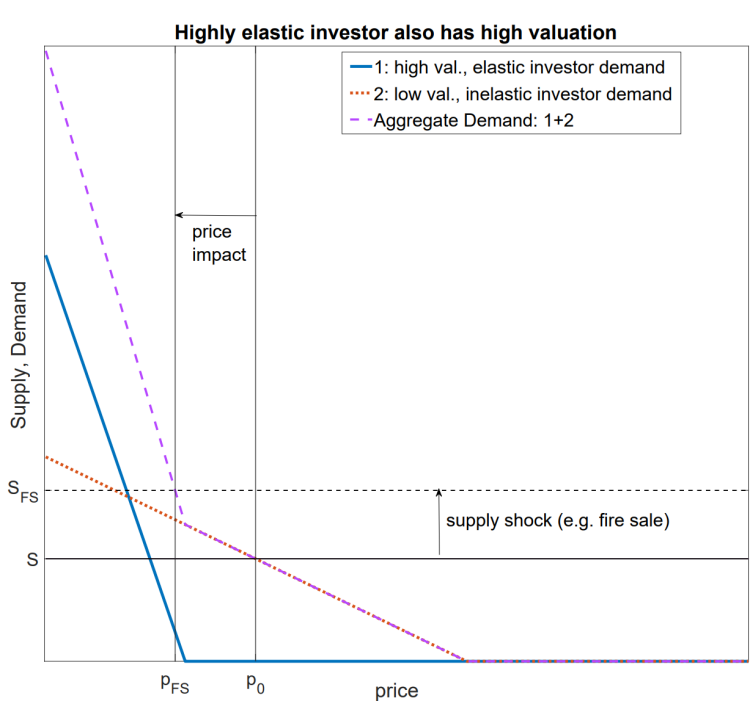


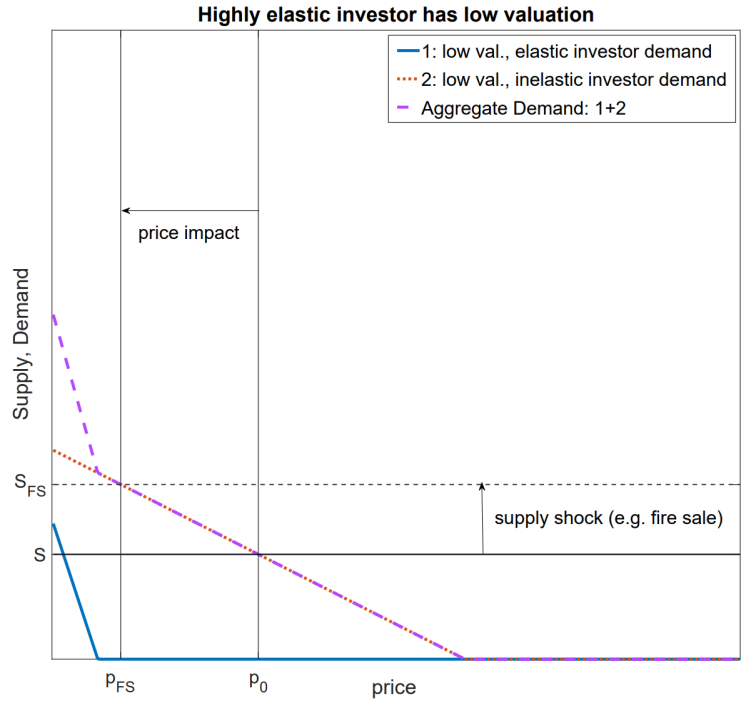


- What happens when specialized investors lack funding?
  - With investor heterogeneity, "money in the right hands" matters.
  - Lower capacity of spec. investors; less spec. investors step in; require higher expected returns; markets still clear but only at lower prices with a less efficient allocation (relative to ex-ante).
  - Discount-rate shocks — no shock to cash flows.

## Main setting: Mutual Fund Fire Sales

Instance of disruption in funding: **Mutual fund fire sales**. $W$ is funds' AUM.

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- **This paper:** Demand-oriented empirical analysis of MF fire sales. Size of non-fundamental FS discount depends on (lack of) specialized demand.

## Empirics

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## "Supply": Stock-level fire sale pressure

- We use Wardlaw's measures: Weighted avg flows to funds under pressure that hold stock $i$ weighted by how important each fund is for stock $i$.

$$\textsc{Flow-To-Volume}_{i,q} = \sum_{f=1}^{M} (\textsc{Flow}_{f,q} \mid \textsc{Flow}_{f,q} < -5\%) \cdot \frac{\textsc{Shares}_{i,f,q-1}}{\textsc{Volume}_{i,q}}$$

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- *Fire-sale stock in t:* Stock in bottom decile of FTV or FTS distribution. FS episodes
- Employed measures
  - i) are not mechanically related to returns,
  - ii) do not condition on stocks being sold (pressure does not reveal quality-driven selling decision).

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- Flows not required, **avg. active share** of co-holding funds as stock-level indicator of elasticity.

$$\textsc{Active Share}_{i,q} = \frac{1}{F}\sum_{f=1}^{F}(\textsc{Active Share}^{i}_{f,q} \mid \textsc{Flow}^{i}_{f,q} > -5\% \cap f \text{ is active}).$$

## Price pressure with different amounts of specialized demand

# Price effects of specialized demand in fire sale episodes

## Fire-sale discounts: FS defined as Flow-to-volume

# 30% smaller discount when Spec Flow is higher by 1 SD

| | CAR during FS quarter | | | |
|---|---|---|---|---|
| | (1) | (2) | (3) | (4) |
| Spec Flow$_{i,q}$ | **0.090**$^{***}$ | **0.088**$^{***}$ | **0.086**$^{***}$ | **0.086**$^{***}$ |
| | (3.66) | (3.50) | (3.36) | (2.66) |
| Flow-To-Volume$_{i,q}$ | 0.875$^{***}$ | 0.578$^{*}$ | 0.516 | 1.872$^{***}$ |
| | (3.07) | (1.70) | (1.57) | (5.02) |
| Controls: | | | | |
| Time-varying controls | | Yes | Yes | Yes |
| Stock FE | | | | Yes |
| Year × Quarter FE | Yes | Yes | | |
| Industry × Year-Quarter FE | | | Yes | Yes |

*Time-varying controls:* Fragility$_{q-1}$, Liquidity$_{q-1}$, SD(ret)$_{q-1}$, Ret$_{q-1}$, Negative earnings surprise$_q$, Market Cap$_{q-1}$, Inst. Ownership$_{q-1}$.

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| Stock FE | | | | Yes |
| Year × Quarter FE | Yes | Yes | | |
| Industry × Year-Quarter FE | | | Yes | Yes |

*Time-varying controls:* $\text{Fragility}_{q-1}$, $\text{Liquidity}_{q-1}$, $\text{SD(ret)}_{q-1}$, $\text{Ret}_{q-1}$, Negative $\text{earnings surprise}_{q}$, $\text{Market Cap}_{q-1}$, $\text{Inst. Ownership}_{q-1}$.

- Similar results for flows to funds which do not hold the stock itself but do hold industry peers $\textsc{Ind Flow}$ Industry flows

## Additional tables: Active Share

# 28% smaller discount when co-holder's avg active share is higher by 1 SD

| | CAR during FS quarter | | | |
|---|---|---|---|---|
| | (1) | (2) | (3) | (4) |
| Active Share$_{i,q}$ | **0.048**$^{***}$ | **0.041**$^{**}$ | **0.039**$^{**}$ | **0.052**$^{**}$ |
| | (2.65) | (2.18) | (2.07) | (2.35) |
| Observations | 24711 | 24711 | 24711 | 23021 |
| $R^2$ | 0.082 | 0.10 | 0.16 | 0.36 |
| Time-varying controls: | | | | |
| Control Variables | | Yes | Yes | Yes |
| Stock FE | | | | Yes |
| Year × Quarter FE | Yes | Yes | | |
| Industry × Year-Quarter FE | | | Yes | Yes |

## Discounts evaporate

### Return differentials are transient

- FS Stocks with low spec demand have higher returns after the fire sale episode.
- The discount differential evaporates (no difference in LT cumulative returns)

| | Panel A: $\text{CAR}^{3m \to 3m+24m}$ | | | |
|---|---|---|---|---|
| $\text{SPEC INDEX}_{i,q}$ | $-0.014^{*}$ | $-0.014^{*}$ | $-0.014^{*}$ | $-0.018^{**}$ |
| | (-1.73) | (-1.73) | (-1.72) | (-2.52) |

| | Panel B: $\text{CAR}^{0m \to 3m+24m}$ | | | |
|---|---|---|---|---|
| $\text{SPEC INDEX}_{i,q}$ | -0.003 | -0.003 | -0.005 | -0.007 |
| | (-0.40) | (-0.40) | (-0.57) | (-1.02) |
| Controls: | | | | |
| Flow-to-Volume/Flow-to-Stock | Yes | Yes | Yes | Yes |
| Stock FE | | | | Yes |
| Year $\times$ Month FE | Yes | Yes | | |
| Industry $\times$ Year-Month FE | | | Yes | Yes |

Further results

- *Passive specialization* has hardly any effect (passive funds lack discretion to 'pick up' stocks). Passive specialization
- Robust to controlling for cash holdings and access to interfund lending; *within* samples of large and small stocks.
- Works in other instances of non-fundamental price pressure, e.g. index reconstitutions.
- Specialization index (combination of different definitions of specialization) yields similar results.

# Mechanisms

## Asset quality as a potential driver?

- Recent literature suggests adverse selection and hence asset quality as driver of FS discounts (Dow and Han, 2018; Huang et al., 2022).

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- Recent literature suggests adverse selection and hence asset quality as driver of FS discounts (Dow and Han, 2018; Huang et al., 2022).
- *Our results* seem to be **not driven by asset quality**. E.g.:
  - i) Our measure of demand does not condition on actual buys.
  - ii) Results are *within* FS pressure levels at a given point in time, within one industry at a time or for one stock at different points in time.
  - iii) If low spec demand indicated poor quality, there should not be reversals – but there are.
  - iv) *Fire-sale pressure from passive* funds (whose selling decisions convey no stock-specific information): similar results.
  - v) Stocks with high spec demand do not seem to have less asymmetric information: neg. earnings surprises, etc.

Asymmetric information

# Demand composition as a driver

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- Results consistent with positive discount-rate shocks: higher discounts in FS quarter followed by transiently higher returns.

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# Spec funds buy stocks under pressure

- Specialized funds have higher elasticity $\left|\frac{\partial \text{portf weight}}{\partial \text{price}}\right|$.

| | ΔWeight | | | |
|---|---|---|---|---|
| | (1) | (2) | (3) | (4) |
| FireSaleStock$_{i,q}$ | **0.0156**$^{***}$ | -0.0005$^{***}$ | | |
| | **(14.05)** | (-28.78) | | |
| PrcChg$_{f,q}$ | | | **-0.0073**$^{***}$ | 0.0002$^{***}$ |
| | | | **(-9.35)** | (19.93) |
| Observations | 7,500,124 | 199,853,405 | 251,979 | 11,429,501 |
| $R^2$ | 0.28 | 0.12 | 0.59 | 0.32 |
| Controls: | | | | |
| Year-Quarter FE | | | | |
| Fund × Stock FE | Yes | Yes | Yes | Yes |
| Fund × Year-Quarter FE | Yes | Yes | Yes | Yes |
| Sample consisting of: | | | | |
| Holdings | specialized | non-specialized | specialized | non-specialized |
| Stocks | all | all | fire-sale stocks | fire-sale stocks |

# Demand composition as a driver

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# Spec funds buy stocks under pressure

- Specialized funds have higher elasticity $\left|\frac{\partial \text{portf weight}}{\partial \text{price}}\right|$.
- ... and buy stocks under pressure when i) they specialize in those stocks ii) they have inflows.

| | ΔWeight | | | | ΔShares | |
|---|---|---|---|---|---|---|
| | (1) | (2) | (3) | (4) | (5) | (6) |
| FireSaleStock$_{i,q}$ | 0.0156*** (14.05) | -0.0005*** (-28.78) | | | **81.0188*** (1.94)** | **-20.3419*** (-25.63)** |
| PrcChg$_{f,q}$ | | | -0.0073*** (-9.35) | 0.0002*** (19.93) | | |
| Flow$_{f,q}$ | | | | | **22.9351*** (50.98)** | **0.0697*** (6.92)** |
| FireSaleStock$_{i,q}$ × Flow$_{f,q}$ | | | | | **17.3617*** (3.29)** | **-0.4941*** (-5.65)** |
| Observations | 7,500,124 | 199,853,405 | 251,979 | 11,429,501 | 7,389,433 | 200,595,265 |
| $R^2$ | 0.28 | 0.12 | 0.59 | 0.32 | 0.27 | 0.12 |
| Controls: | | | | | | |
| Year-Quarter FE | | | | | Yes | Yes |
| Fund × Stock FE | Yes | Yes | Yes | Yes | Yes | Yes |
| Fund × Year-Quarter FE | Yes | Yes | Yes | Yes | | |
| Sample consisting of: | | | | | | |
| Holdings | specialized | non-specialized | specialized | non-specialized | specialized | non-specialized |
| Stocks | all | all | fire-sale stocks | fire-sale stocks | all | all |

## Underlying drivers

**Less efficient allocations** (compared to ex-ante)

- With low spec demand, more of the asset is held by non-specialized investors.

Dependent variable: Non-specialized new holders. Mean: 0.099, Median: 0

| | Flow-to-volume | | | |
|---|---|---|---|---|
| Spec Index$_{i,q}$ | **-0.016**$^{**}$ | **-0.020**$^{**}$ | **-0.022**$^{**}$ | **-0.012**$^{**}$ |
| | (-2.00) | (-3.37) | (-3.23) | (-2.63) |
| Flow-To-Volume$_{i,q}$ | 4.727$^{**}$ | -0.017 | -0.142 | -0.619 |
| | (6.16) | (-0.03) | (-0.29) | (-1.23) |
| Observations | 24711 | 24711 | 24711 | 23021 |
| $R^2$ | 0.014 | 0.025 | 0.061 | 0.40 |
| Controls: | | | | |
| Control Variables | | Yes | Yes | Yes |
| Stock FE | | | | Yes |
| Year × Month FE | Yes | Yes | | |
| Industry × Year-Month FE | | | Yes | Yes |

## Summary

- Fire sale discounts depend on the availability of specialized demand (which depends on funding liquidity).
- Discounts are likely due to inefficient allocations rather than adverse selection.
- Outlook: Further disentangle level and elasticity channel

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## Implications

- Demand-based AP: Active specialization determines elasticity
- CF: Fire sales absent specialized demand as non-cash flow price shocks.
- Allocational efficiency as a prerequisite for price efficiency
- Financial stability: Leverage constraints $\rightarrow$ inefficient allocations & prices?
  - Should funds have access to LOLR (Breckenfelder and Hoerova, 2023)?

# References


Breckenfelder, J. and M. Hoerova (2023): "Do non-banks need access to the lender of last resort? Evidence from fund runs," .

Coval, J. D. and E. Stafford (2007): "Asset fire sales (and purchases) in equity markets," *Journal of Financial Economics*, 86, 479–512.

Dow, J. and J. Han (2018): "The paradox of financial fire sales: The role of arbitrage capital in determining liquidity," *The Journal of Finance*, 73, 229–274.

Duffie, D. (2010): "Presidential address: Asset price dynamics with slow-moving capital," *Journal of Finance*, 65, 1237–1267.

Edmans, A., I. Goldstein, and W. Jiang (2012): "The real effects of financial markets: The impact of prices on takeovers," *Journal of Finance*, 67, 933–971.

Haddad, V., P. Huebner, and E. Loualiche (2021): "How competitive is the stock market? Theory, evidence from portfolios, and implications for the rise of passive investing," *Working Paper*.

Huang, S., M. C. Ringgenberg, and Z. Zhang (2022): "The information in asset fire sales," *Working Paper*, 1–53.

Koijen, R. S. J. and M. Yogo (2019): "A Demand System Approach to Asset Pricing," *Journal of Political Economy*, 127, 1475–1515.

Llorente, G., R. Michaely, G. Saar, and J. Wang (2002): "Dynamic volume-return relation of individual stocks," *Review of Financial Studies*, 15, 1005–1047.

Schmickler, S. (2020): "Identifying the price impact of fire sales using high-frequency surprise mutual fund flows," *Available at SSRN 3488791*.

Shleifer, A. and R. W. Vishny (1992): "Liquidation Values and Debt Capacity: A Market Equilibrium Approach," *The Journal of Finance*, 47, 1343–1366.

van der Beck, P. (2024): "On the estimation of demand-based asset pricing models," Tech. rep.

Wardlaw, M. (2020): "Measuring mutual fund flow pressure as shock to stock returns," *Journal of Finance*, 75, 3221–3243.

Weber, R. (2023): "Institutional Investors, Households, and the Time-Variation in Expected Stock Returns," *Journal of Financial and Quantitative Analysis*, 58, 352â€“391.