ETF Short Interest and Failures-to-Deliver: Naked Short-Selling or Operational Shorting?

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- **My Big Point:** Operational shorting **substitutes** for pure AP activity $\Rightarrow$ Can authors examine the extent? What about relative price efficiency?

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- Implicitly, the ETF mechanism assumes that ETF investors' demand is downward sloping in the short-run and/or demand for the underlying is downward sloping in the short-run

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  - $\psi_t \equiv p_t - \pi_t \Rightarrow$ ETF premium

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Model Timing

(1) The ETF and underlying asset are efficiently priced at $t = 0$
   (a) Demand shock hits both ETF and underlying assets (but to different degrees),
   (b) APs step in and exploit mispricing
      (i) Create (redeem) shares to exploit arbitrage,
      (ii) and/or operational shorting to exploit arbitrage
   (c) AP arbitrage activity affects price levels of both ETF and underlying asset,

(2) The ETF's price and underlying asset's NAV are established at $t = 1$,
   (a) The ETF premium is finalized

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- $t = 1$: ϵ_1 is drawn from $g(\epsilon_1)$ on the support $(-\infty, \infty)$

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    - For example, linear pricing rule in Kyle (1985)

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Arbitrage Activity

- Each AP's optimal creation/redemption choice solves,

$$\max_{\delta_i^{AP},\delta_i^{OS}\in\mathbb{R}} \underbrace{\delta_i^{AP}\left(p_1(\delta_i^{AP}+\delta_i^{OS}+\delta_{-i}^{AP}+\delta_{-i}^{OS})-\pi_1(\delta_i^{AP}++\delta_{-i}^{AP})\right)}_{\text{AP Activity Profits}}$$

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- AP's choice **partially** internalizes effects on both the ETF and underlying asset prices

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- Equilibrium premium is given by:

$$\psi_t \equiv p_t - \pi_t = \frac{(1-\beta)\omega(\lambda+\phi)\epsilon}{(N+1)\omega(\lambda+\phi)-N\lambda^2}$$

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Comparative Statics of AP and OS Activity

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- **EP**: Less liquid underlying should be characterized by more operational shorting and less AP activity (substitution effect)

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- More inelastic demand for ETF shares, less operational shorting and less AP activity
- **EP**: Liquid ETFs with diverse clienteles should have more operational shorting and more AP activity

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- More APs, internalize a smaller fraction of AP and OS activity and trade more
- **EP**: ETFs with more APs should have relatively more operational shorting and more AP activity

- Model is generally consistent with paper!

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Bringing it Altogether & Concluding Thoughts

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- Authors may find interesting results looking at the composition of arbitrage activity (fraction that is operational shorting and fraction that is traditional AP creation/redemption activity)

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