

ETFs, Arbitrage and Contagion

by

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Discussion

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Overview

- Rich empirical analysis of arbitrage between ETF price and the value of their underlying (NAV)
- What is the message of the paper?
 - Uncomfortable with some of the language on contagion
 - What is the counterfactual? Would market quality improve if ETFs did not exist?
- What is the right econometric set-up?
 - Loose relationship between hypothesis and tests
 - Can a more structural approach unify the analysis?
 - Some tentative suggestions

Why do ETFs exist?

- **ETF:** Can buy/sell directly to the outside market, but pay a state dependent competitive liquidity discount, costs of liquidity are market driven
- **Index Fund:** Buy/sell at NAV plus a fixed fee; not state dependent, costs of liquidity presumably higher and exogenous
- Difference:
 - ETFs have better liquidity features than index funds?
 - Better (directly) value disclosure?

Why do ETFs exist?

- What are the policy issues?
 - Investor self-selection? Liquidity advantage from ETFs?
 - Large versus small investors? Can small investors benefit more? Do small investors trade more given ETF access?
 - What if SEC shuts down all ETFs? What would be the general equilibrium effects?

What is the counterfactual?

- *“The main message of the paper is that arbitrage activity between ETFs and the underlying assets has the potential to propagate liquidity shocks”*
- Would market quality be better for less arbitrage?
- Would market quality be better if ETFs are replaced by index funds
- Index funds also propagate liquidity shocks, but less so?

Econometric Issues

- No model, but conjecture about the asset price dynamics:

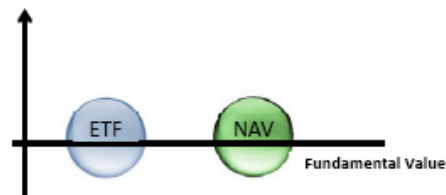


Figure 1a. Initial Equilibrium

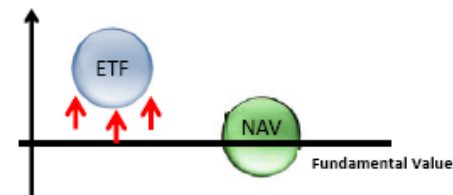


Figure 1b. Non-Fundamental Shock to ETF

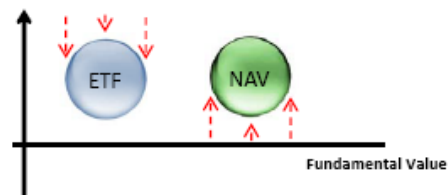


Figure 1c. Initial Outcome of Arbitrage: the non-fundamental shock is propagated to the NAV, the ETF price starts reverting to Fundamental Value

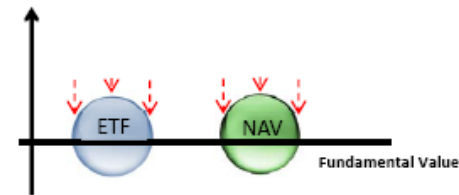


Figure 1d. Re-establishment of Equilibrium: after some time both the ETF price and the NAV revert to Fundamental Value

Econometric Issues

- ETF value should be co-integrated with NAV
- NAV should be co-integrated with latent fundamental value

$$\Delta P_{t+1}^{ETF} = \alpha(NAV_t - P_t^{ETF}) + \sigma_1 \varepsilon_{1t}$$

$$\Delta NAV_t = \beta(F_t - NAV_t) + \gamma(P_t^{ETF} - NAV_t) + \sigma_2 \varepsilon_{2t}$$

- Predictions: $\alpha > 0, \beta > 0, \gamma > 0$
- ETF arbitrage function of volatility and costs
 $\alpha = f(Vol, Cost), \gamma = g(Vol, Cost)$
- Asymmetric costs? Long NAV position easier than short position, therefore $\alpha^+ > \alpha^- > 0, \gamma^+ > \gamma^- > 0$

Econometric Issues

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$$\alpha = f(Vol, Cost), \quad \gamma = g(Vol, Cost)$$

- *Vol, Cost*: Should be ETF specific and contemporaneous
- Use lagged values as instruments
- Parameters here more meaningful than in the VAR (Table 5)
- Should past arbitrage profits matter?
 - Aggregate measure: Could just proxy for past volatility

Extension to Microstructure Framework?

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$$\alpha = f(Vol, Cost), \quad \gamma = g(Vol, Cost)$$

- Model bid and ask prices separately
- Endogenize “Cost”
- Problems:
 - Trace four price processes
 - Intraday frequency needed
 - Event study flash crash (separate paper)

Conclusion

- Very promising and rich analysis
- Theory:
 - Needs more conceptual development about the role of ETFs relative to index funds;
 - What effects do ETFs generate which index funds don't?
- Econometrics:
 - More unified and more structural framework