

Discussion of

Steering a Ship in Illiquid Waters: Active Management of Passive Funds

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Increasing importance of passive investment

Passive-ownership for US equities grew from 13% in '00 to 33% in '21 (Chinco-Sammon '23)

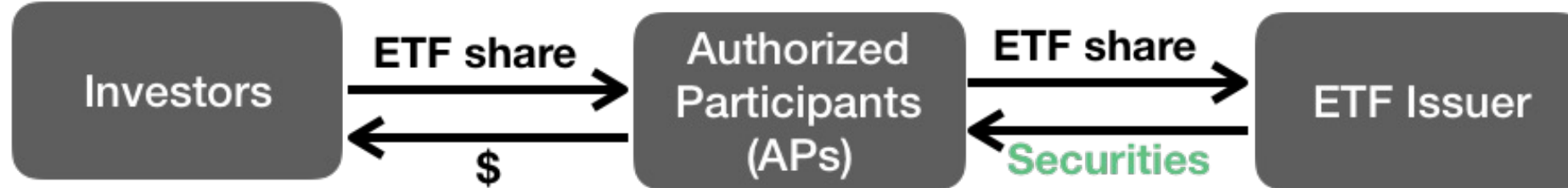
- Exchange traded funds: from \$66bn in '00 to \$7.2tn in '21 (ICI)
- Index mutual funds: from \$384bn in '00 to \$5.7tn in '21 (ICI)
- Target date funds: from \$8bn in '00 to \$3.27tn in '21 (Morningstar)

Implications

- Prices & efficiency (e.g., Ben-David-Franzoni-Moussawi '18, Coles-Heath-Ringgenber '22)
- Corporate governance (e.g., Appel-Gormley-Keim '16, Bebchuk-Hirst '19)
- Market inelasticity (e.g., Parker-Schoar-Sun '23, Gabaix-Koijen '23, Lu-Wu '23)
- **This paper: bond ETFs are actively managed with state contingent liquidity effects**

Corporate Bond ETFs *actively* manage portfolios

- Conventional view of ETF management: Passive investment
- This paper shows ETFs actively manage portfolios to trade off between
 - Minimize index-tracking errors
 - **Facilitate liquidity transformation: APs absorb demand shocks**



⇒ For bond ETFs: implications on market liquidity

- When demand shocks are idiosyncratic: improved liquidity
- When demand shocks are systematic: deteriorated liquidity

Model

- Diamond-Dybvig setup with a tradable ETF
 - Unit measure of agents with three possible types (mean-variance)
 - Impatient consumers (π_c); impatient savers (π_s); patient investors
 - AP: a deep-pocketed, risk-neutral, representative arbitrageur
 - With fixed cost (\propto # of securities) + variable cost
- Objectives
 - ETF: maximizing aggregate welfare
 - Ideally low index tracking errors & high liquidity transformation
 - AP: maximizing arbitrage profit
- Results
 - ETF price = NAV + premium/discount based on ($\pi_s - \pi_c$)
 - Empirical predictions

Rich empirical predictions

- Active basket management of ETFs
 - ETF includes cash and a subset of bonds, and
 - When the bonds are more liquid: proportion of cash in baskets ↓, tracking error ↓
 - ETF dynamically adjusts its baskets
 - When cash is overweighted: ETF increases (/decreases) its weight in the RD (/CR) basket
 - When a given security is overweighted: ETF increases (/reduces) its weight in the RD (/CR) basket
 - Smaller adjustments with less liquid bonds
- Implications for underlying securities
 - A bond is more liquid when included in a basket
 - Opposite result w/ large CR/RD imbalance, e.g., Covid

Model

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Comment 1 Can the ETFs price discriminate? If not, probably they only care about fees?

Key fact: ETF includes cash and a subset of bonds

Cash ratio	Average		Distribution				
	Unweighted	Weighted	p10	p25	p50	p75	p90
Realized creation baskets	11.60	7.27	-0.44	0.28	6.25	18.96	34.26
Realized redemption baskets	8.18	3.68	-2.05	-0.00	0.73	6.43	35.19
Reported baskets (All days)	5.39	2.03	0.19	0.54	1.09	2.27	9.28
Reported baskets (CR days)	4.58	1.89	0.11	0.34	0.97	2.23	5.94
Reported baskets (RD days)	7.78	2.45	0.01	0.24	0.80	2.69	10.89
Portfolio holdings	1.70	0.85	0.00	0.44	0.83	1.57	2.47

# of bonds ratio	Average		Distribution				
	Unweighted	Weighted	p10	p25	p50	p75	p90
Realized creation baskets	24.56	18.13	4.22	10.21	19.44	37.44	52.75
Realized redemption baskets	29.80	18.00	3.77	9.64	22.01	38.72	87.12
Reported baskets (All days)	76.06	57.51	44.65	64.28	84.09	94.88	97.35
Reported baskets (CR days)	77.56	59.53	45.15	63.98	85.42	95.13	97.56
Reported baskets (RD days)	78.40	56.22	45.73	69.80	86.75	96.72	100.00
Portfolio holdings	81.28	91.39	45.64	64.76	88.03	96.70	102.39

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Question: Asymmetric cash ratio in CR/RD baskets: Why cash ratio is much higher in CR basket?

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Question: Bond selection: Which bonds are chosen for the basket?

Comment 2: role of liquidity vs AP

- Issuers could prefer a subset of bonds & cash in baskets because of liquidity
 - Asymmetric cash ratio in CR/RD basket: Cash as a filler to avoid transacting large volume of illiquid bonds instantaneously \Rightarrow larger cash ratio in CR basket could indicate higher bond illiquidity in issuer's CR basket
 - Subset of bonds: Bonds are selected based on liquidity; liquid bonds are sold first in crisis, e.g., Covid (Chaderina-Muermann-Scheuch '22)
- Suggestion: additional placebo test
 - Do open-end indexer mutual funds also trade only a subset of bonds and keep cash with large inflows?

Novel empirical identification: monthly index rebalancing

- When bond i is overweighted at t : ETF j increases (/reduces) bond i 's weight in the RD (/CR) basket
 - Empirical challenge: endogenous over/underweighting in ETF portfolios
 - Solution: index rebalancing as a source of plausibly exogenous variation
 - Index weights jump after rebalancing, $Deviation_{ijt} \equiv w_{ijt}^{ETF} - w_{ijt}^{Index}$
 - Overweighting shock: $\Delta Deviation_{ijh} \equiv Deviation_{ijh} - \frac{1}{5} \sum_{k=1, \dots, 5} Deviation_{ijh-k}$
 - A novel instrument for basket inclusion:
 - $CRInstr_{it} = \sum_{j \in J_t^{CR}} \Delta Deviation_{ijh}$

Effect of basket inclusion on bond illiquidity

$$Illiquidity_{it+1} = \beta_1 \widehat{Basket}_{it}^{CR} + \beta_2 \widehat{Basket}_{it}^{RD} + Controls_{it} + \omega_{Ft} + \omega'_{mt} + \epsilon_{it}$$

	Number of Baskets			Basket Shares		
	IL1	IL2	IL3	IL1	IL2	IL3
RD	-15.25*** (4.93)	-15.08*** (5.50)	-7.30* (4.18)	-1.07** (0.52)	-1.41** (0.58)	-0.55 (0.45)
CR	-3.80* (2.26)	-5.38** (2.58)	-8.58*** (1.90)	-1.32*** (0.33)	-0.92** (0.37)	-1.55*** (0.28)
Bond IL	11.78*** (0.12)	11.16*** (0.09)	18.06*** (0.11)	10.46*** (0.10)	11.03*** (0.09)	17.70*** (0.10)
Observations	2020546	1753639	1803581	2020546	1753639	1803581
Adjusted R^2	0.01	0.01	0.02	0.01	0.01	0.02

How to measure bond liquidity?

- Effective tick size
- Imputed roundtrip cost
- Inter-quartile range

*Alternatively, Bao-Pan-Wang '11:
A theoretically motivated measure of illiquidity using autocovariance of prices changes (data: TRACE)*

Bottomline: great paper, I learned a lot!

- Passive ETFs *actively* manage their holdings!
 - A trade-off between index tracking errors and liquidity transformation
 - Rich, convincing empirical results demonstrate an important state-contingent effect of ETF active management on bond liquidity
 - ETFs adjust their baskets actively when a bond is over-/underweighted
 - ETFs manage cash ratios in CR/RD actively when they have too much/little cash
 - Adjustments are smaller when underlying bonds are less liquid
 - Clever identification using plausibly exogenous shocks from index rebalancing
 - Positive effects turns negative with large CR/RD imbalance