"The Rise of Factor Investing: Asset Market Implications and Passive Security Design"

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Motivation: The Rise of Passive Investing

- Passive investing (index funds and ETFs) has grown explosively in recent decades, reshaping asset management

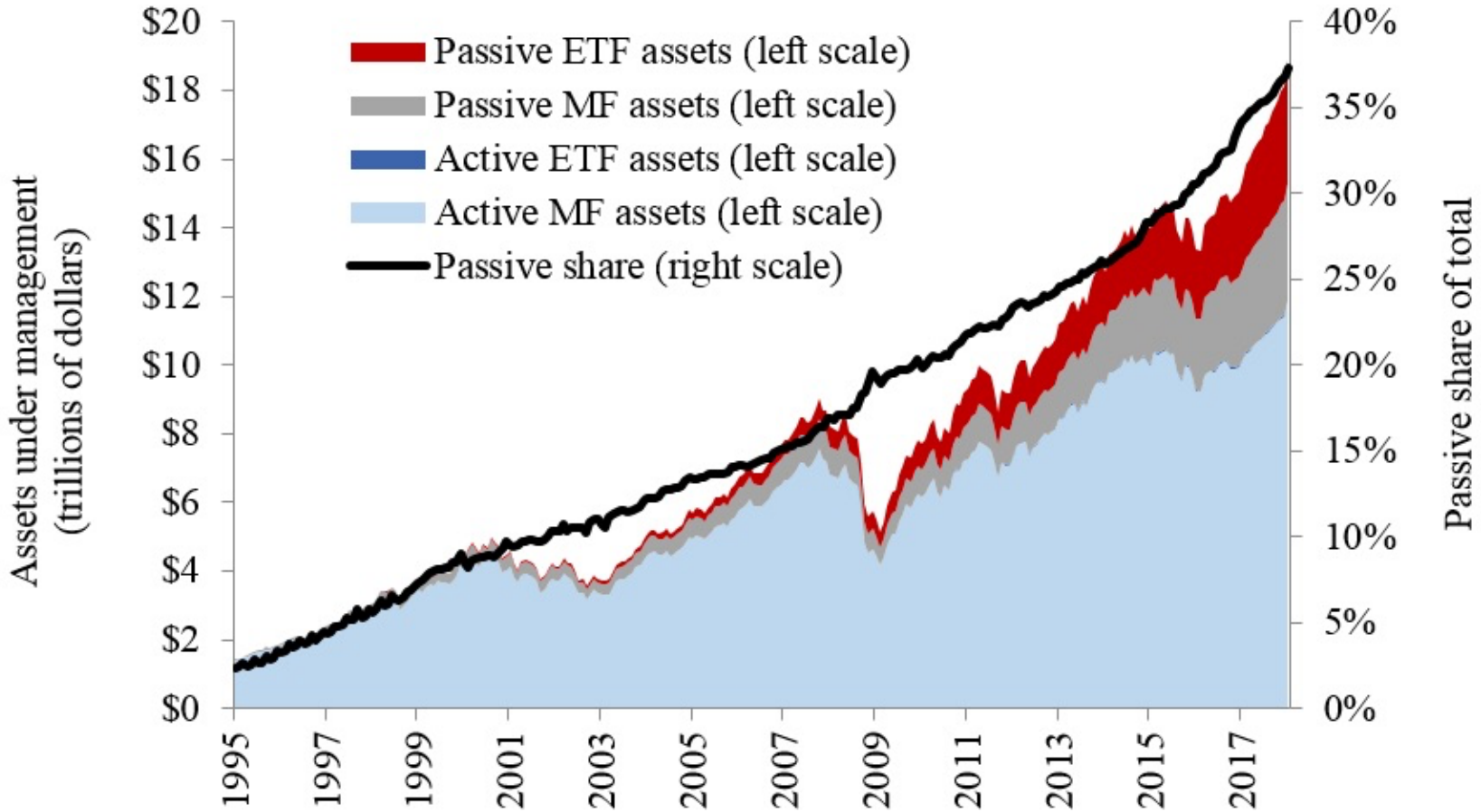


Figure: Source: Morningstar Inc.

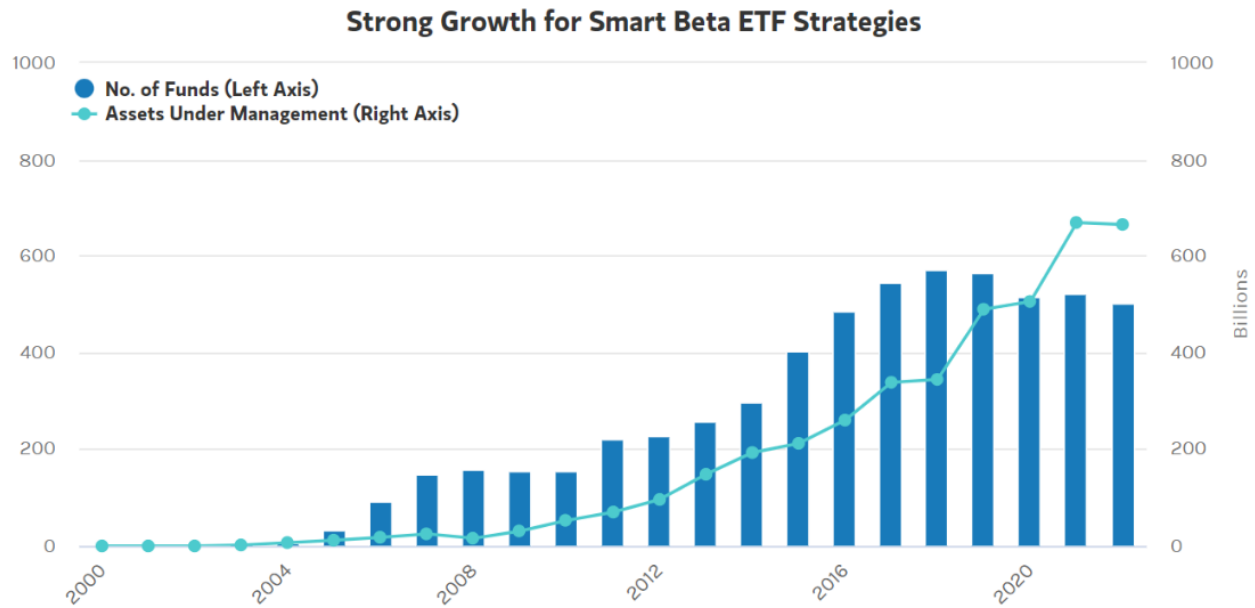
Motivation: The Rise of Passive Investing

- Passive U.S. equity funds now control roughly **50–60%** of total fund assets (up from just 6% in 1996). This shift raises questions about market efficiency and price discovery.
- Investors have poured hundreds of billions into index-tracking funds while actively managed funds have seen net outflows in recent years.
- **Key question:** What are the implications of this "rise of passive" for asset prices and information in markets?

Motivation: The Rise of Factor/Smart-Beta Investing

- A new generation of "smart beta" or factor-based funds has emerged as a middle ground between pure passive and active investing

Figure 1: Strong Growth for Smart Beta ETF Strategies



Source: Morningstar Direct, Morgan Stanley Wealth Management ETF Research as of Dec31, 2022

- **Key question:** Does the proliferation of factor-tilted "passive" products affect market dynamics differently than traditional active management?

Motivation: Market Impact Debate

- The academic and industry debate is **unsettled** on how passive and factor investing affect markets.
- Liquidity and volatility: *reduce* liquidity or increase volatility in underlying stocks (Ben-David, Franzoni, and Moussawi 2018, Madhavan and Sobczyk 2014, Hann 2014, Bradley and Litan 2011, Krause, Ehsani, and Lien 2014), while others find minimal harm or even benefits to liquidity (Ye 2019)
- Information efficiency: less information acquisition (Israeli, Lee, and Sridharan 2017) vs. increase informational efficiency (Glosten, Nallareddy, and Zou 2019, Davila Parlatore 2023, Bai, Philippn, and Savov 2016)
- $\Rightarrow$ **Importance:** We need a framework to understand these mixed observations. This paper tackles that by modeling the impact of factor-based passive investing on asset prices.

Core Contribution: Theoretical Framework

- **New Model of "Passive" Security Design:** The paper develops a theoretical model treating index funds, ETFs, and smart beta products as *composite securities* (CSs) that bundle underlying assets
  - In the model, some investors have information about common **factor** components of asset values, while others focus on asset-specific information.
  - CS issuers competitively choose the basket of underlying stocks (and their weights) to maximize appeal to factor-informed investors.
- This is the first model to endogenize the creation of passive factor-tracking products *and* study their feedback effects on market quality.

Key Model Implications

- **Optimal CS Design:** The optimal index/ETF design in equilibrium uses higher weights on stocks with strong factor exposures and high liquidity (to best represent the factor and minimize trading frictions)
- Impact on Underlying Asset:
  - Increased Factor Information in Prices
  - Higher Return Comovement and Volatility
  - Reduced Asset-Specific Price Discovery
  - Mixed Liquidity Effects
- These results offer a theoretical reconciliation for the **mixed empirical findings** in prior literature by showing factor trading can simultaneously improve broad-market efficiency yet diminish firm-specific price

Assumption: No Price Impact from Non-Informational Flows

No Non-Informational Flows: Prices move only due to information; passive flows themselves don't cause mispricings.

- The model's price formation is driven by investors trading on information (factor or asset-specific). It downplays the role of uninformed or mechanical flows.
- However, a popular concern is that passive investing induces **inelastic demand**: index or factor funds buy/sell regardless of price, potentially moving prices even without new information (Behmaram 2025)
- For example, large index rebalancing trades or ETF creation/redemption flows might cause short-term price pressure on underlying stocks.
- More problematic for market-cap weighted index funds: investor flows are often non-informational – driven by benchmarking, retirement contributions, or passive allocation rather than superior information.

Assumption: No Price Impact from Non-Informational Flows

- **Question:** How would the model's outcomes change if we introduce some noise traders or price-insensitive passive flows?

  Could incorporating a fraction of purely mechanical passive investors lead to overshooting or other stability issues (e.g., bubble-like dynamics in the factor)?

- **Suggestion:** A discussion on this point would be valuable. Perhaps the authors can argue why strategic arbitrageurs in the model would eliminate such effects, or whether a hybrid model is needed to address flow-driven price impacts.

Discussion 2: Empirical Extensions and Tests

Current Analysis: focused on ETF portfolio design
Implications on underlying asset liquidity and price cites previous literature

Suggestion: Test model's **market implications** more directly:

1. *Time-Series Tests:* Do markets evolve as predicted when factor investing grows over time?
2. *Event Studies:* Can we observe immediate market changes when a new factor ETF is introduced or when existing ones see large flows?

These tests would help more clearly validate the model's broader implications beyond the composition of ETFs.

Proposed Empirical Test: Time-Series Trends

- **Model prediction:** As passive factor investing increases (over years or across markets), we should see:
  - Higher overall market informational efficiency (more variance explained by common factors).
  - Greater stock return synchronicity (stocks moving more with factor indices) and possibly higher volatility of those common factors.
  - A decline in firm-specific return variation and perhaps lower benefit to individual stock picking.
- Would be interesting and helpful to show some of the statistics utilizing time-series data:
  - Correlate the rise in passive ownership (e.g., % of market cap in index funds/ETFs) with measures like average R^2 of stocks in factor models, or the dispersion of analyst forecasts (as a proxy for firm-specific info).
  - Plot the measures over time alongside growth in factor investing funds

Proposition 4.2: Cross-Sectional Liquidity Impact of Factor ETF Introduction

- Introducing a composite security (factor-tracking ETF) brings more factor-informed traders into underlying asset markets. Liquidity impact depends on the number of new factor traders (N_{CS}):
  - If N_{CS} is small (few adopt the ETF): the adverse selection effect dominates $\Rightarrow$ price impact increases for all stocks (liquidity deteriorates)
  - If N_{CS} is large (many adopt): the competition effect dominates for stocks heavily traded by factor investors, lowering their price impact (improved liquidity), while stocks with few factor traders still see higher price impact (worse liquidity).

Potential Empirical Test

- Use the launch of a factor ETF - identify well-defined factor ETF
- **Difference-in-differences:** Compare the liquidity change of stocks highly exposed to the factor vs. low-exposure stocks
- **Baseline regression:**

$$\text{Illiquidity}_{i,t} = \alpha_i + \lambda_t + \gamma\,(\mathit{Post}_t \times \mathit{Exposure}_i) + \beta\, X_{i,t} + \varepsilon_{it}, \quad (1)$$

where $\mathit{Exposure}_i$ proxies factor trading intensity (e.g. factor beta). γ captures the differential liquidity shift for high- vs. low-exposure stocks.

- Key test: Is γ significantly negative (indicating improved liquidity) for high-exposure stocks relative to low-exposure stocks?
- If ETF is large/popular (proxy for N_{CS}): γ negative
- If ETF is small (proxy for N_{CS}): γ weak, insignificant

Comment 3: Potential Extensions

- Currently: one factor in model so security design analysis is on which assets funds would choose to utilize to sample a specific factor index
- **Multiple Factors and Interactions:** Extend the model to multiple cross-cutting factors (value, momentum, etc.) and/or multiple composite securities. How do interactions play out? Would we see multiple specialized ETFs each impounding information about different factors, and how would that affect assets that load on several factors?

  This could yield insights into how information competition between factors works and the decision-making of what type of factor funds are launched by these investment companies.

Comment 3: Potential Extensions

- **Welfare and Normative Analysis:** Are these developments good for investors and markets in the long run? Does greater factor efficiency outweigh the loss of idiosyncratic information?

  It would be interesting to examine if total risk-sharing or cost of capital is improved or worsened by factor investing proliferation.

Concluding Thoughts

- Paper addresses a highly relevant topic with a novel theoretical approach, offering a coherent explanation for how "passive" factor investing impacts information efficiency of underlying assets
- Are able to offer insight into security design choice of these fund families / managers
- Helps reconcile past empirical literature on the impact of passive share and ETFs on asset volatility, liquidity, etc.
- I find the paper timely and important, and look forward to seeing it published in a top journal!