Discussion of:

The Unintended Consequences of Rebalancing

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The basic idea

- There is now a lot of AUM in "passive" funds.
  - early 90s about 3%; now more than 50% (Vayanos).
    - Current US Equity market cap is $62.2 Trillion.
  - This shift to passive was arguably a response to the poor performance of active funds (Jensen, 1968)
  - Passive funds are largely VW (market-capitalization weighted), for good reason
- If passive funds are truly weighted, they only trade as a result of fund or security cashflows:
  - firm issuance/repurchase, dividends, stock grants, etc. (Daniel and Titman, 2006)
  - fund inflows/outflows
- See Sammon and Shin (2024)

The basic idea(2)

- However, to the extent that fund weights are based on non market-cap measures, they will be forced to rebalance. Examples:
  - EW, book-value weighed, etc. funds.
  - "Balanced" funds (i.e., 60/40 funds)
- This paper (HMM) argues that the trading required to keep funds "balanced" costs those participating in these funds costs the investors in these funds $16 Billion/year.
  - TDFs have gone from <$8B in 2000 to $6T AUM in 2021 (Parker, Schoar, and Sun, 2023).
  - But HMM argue that about $20 Trillion in assets is managed according to this rule.
  - The funds reblanace to 60/40 allocations at the same time, and their correlated trades can result in price pressure

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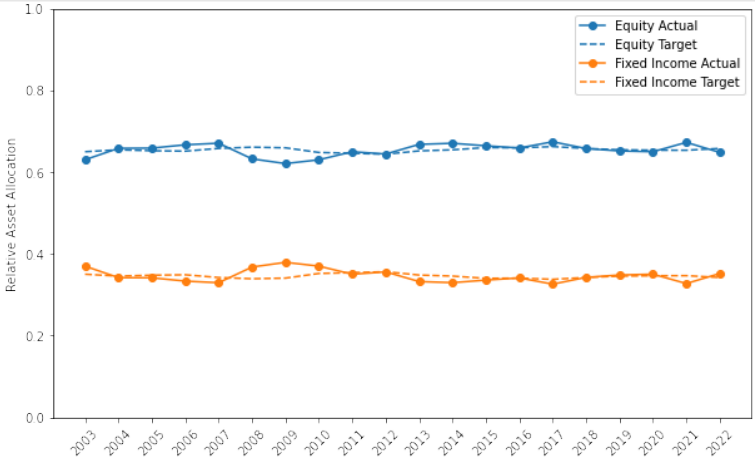
Pension Funds' Aggregate Asset Allocation



- This is Figure D.1; as of the end of FY22, public equity and fixed income allocations amounted to about 64% of total portfolio weights (p. 50)

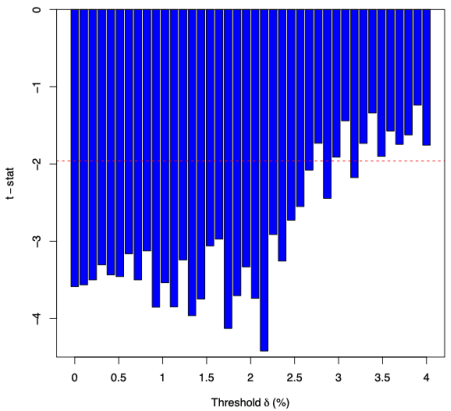
Discussion

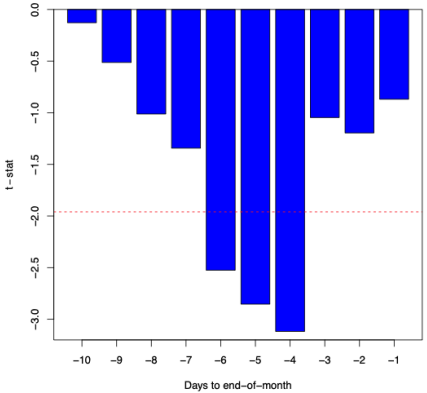
- This is a really interesting paper with some fascinating and impressive results.
- Based on their hypothesis, the create a trading rule that generates impresive Sharpe Ratios,
- HMM estimate the costs borne by the investors in these ($16 Billion/year, $200/person·year) without any data on fund holdings or trades.
- I want to talk about how they estimate these dollar costs.

How do balanced funds rebalance?

- HMM consider two possibilities:
  1. a *Threshold* rule.
  2. a *Calendar* rule.
- They effectively ask: what if these $20T of funds follow one of these rules, and there is inadequate liquidity provision?
- What would be the implications for (conditional) stock and bond market returns?
- If this is the rebalancing rule, the Threshold and Calendar signals should forecast stock and bond returns in the right direction.
  - To test this, build trading strategy and test using S&P E-Mini and 10-year Treasury futures

Threshold & Calendar Signal – return forecastability





Threshold and Calendar Signals

- Threshold signal:
  - Based on hypothesis that when the stock/bond allocations deviates from 60/40 by more than δ%, fund will rebalance
  - Baseline threshold signal here is combination of δs from 0.1–2.5%:

$$\text{Threshold Signal}_t = \frac{1}{N} \sum_{\delta=0}^{2.5\%} \text{Threshold Signal}_t^{\delta}$$

- Calendar signal:
  - Based on hypothesis that the funds rebalance to exactly 60/40 monthly.
  - Baseline calendar signal assumes all rebalancing occurs 5 days prior to end of month.
- Note that there is potentially a bias here as a result of multiple comparison, and the t-statistic should be corrected to account for this.

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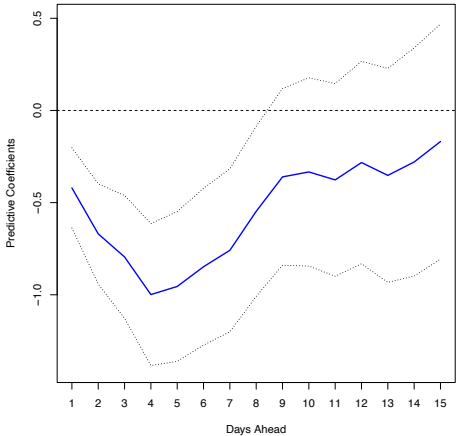
How well do the Calendar and Threshold Signals work?

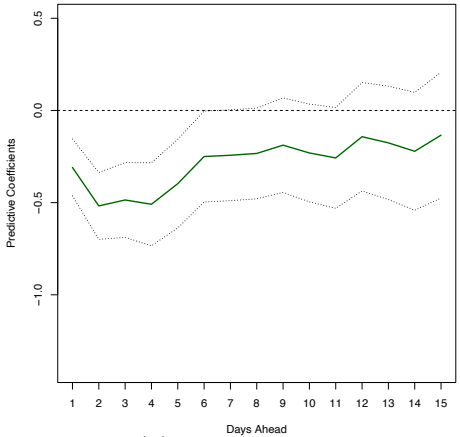
- Really well, especially after controlling for short, medium and longer-term momentum.
- The signal is short-term, and reverts quickly, suggesting that it really is "picking up" price pressure.
- This is a really nice finding.
- The authors argue that it isn't a "reversal" strategy.
  - I disagree, but it is better motivated than simple reversal.

Threshold & Calendar Signal – Rebalancing Price Pressures

$$Ret_{t+1,t+i} = \beta_0 + \beta' RebalancingSignal_t + \psi Momentum_t + \zeta Ret_t + \epsilon_{t+1,t+i}$$



(a) Threshold



(b) Calendar ∗ week4

Magnitudes

- The $16 Billion annual cost effectively assumes that all $20 Trillion rebalances in just about the worst way possible.
- HMM show that small random deviations from this strategy lead to far lower costs
  - How many funds are doing this?
- Given the finding that "...[r]ebalancing pressures revert almost entirely within two weeks", it is also possible that there are funds that are earning and extra 8 bps from supplying liquidity.
  - How many funds are doing this?
  - If the managers know about these patterns, they could design a trading rule that would keep them close to 60/40, and *profit* from these patterns.
- Without direct evidence on institutional investor trades, we can't even say whether this number is positive or negative.
  - Is there quantitative data consistent with the reported fund manager comments?

What do we know about TDF rebalancing?

- Parker, Schoar, and Sun (2023) do use Target Date Funds holdings data, and conclude that:

  Following monthly differential returns between asset classes, we estimate that roughly 45% of the predicted rebalancing is implemented in the same month, 25% in the following month, and another 10% with a two-month lag. (p. 2675)

- In addition, they find that:

  . . . contrarian trading by TDFs appears to be profitable during this time period.

What *should* happen to liquidity provision over time?

- There are a set of anomalies realated to short-term liquidity provision that have essentially "disappeared":
  - The index-inclusion effect: (Shleifer, 1986); Wurgler and Zhuravskaya (2002)
  - The short-term reversal effect: (Collin-Dufresne and Daniel, 2015)
  - Levered and Inverse ETFs (Cheng and Madhavan, 2009)
- I think (?) it is fair to say that profits for each of these for liquidity-providers/front-runners were high initially.
- However, as competition between liquidity providers increased the profits associated with liquidity provision fell.
- If that isn't happening here, why not??

Conclusions and Suggestions

- Really interesting theory and return predictability results.
- It seems possible (likely?) that the estimated costs to investors are overstated
  - and the gains to liquidity providers.
- It would be really interesting to see these estimates supported with holding/trading data.

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