The Sound of Many Funds Rebalancing

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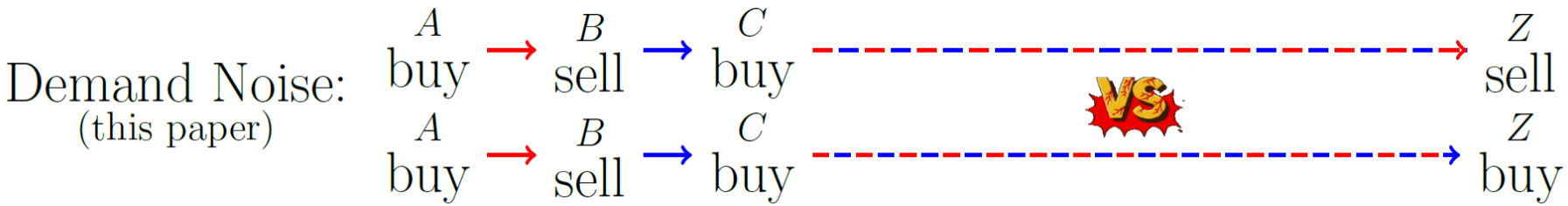
ETF Rebalancing Cascade - Mechanism



ETF Rebalancing as a Source of Noise Trading

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- Stocks that are on the edge of rebalancing for more ETFs are more likely to be hit by ETF rebalancing cascades.
- The net direction of these induced shocks is unpredictable.

ETFs

ETFdb.com

Press F11 to exit full screen

Symbol	Name	AUM	Avg Volume
SPY	SPDR S&P 500 ETF	$276,902,612.07	111,645,094
IVV	iShares Core S&P 500 ETF	$158,288,808.75	5,473,925
VTI	Vanguard Total Stock Market ETF	$96,221,298.19	3,263,433
VOO	Vanguard S&P 500 ETF	$91,640,592.20	3,379,582
EFA	iShares MSCI EAFE ETF	$79,276,291.69	29,078,234
VWO	Vanguard FTSE Emerging Markets ETF	$71,000,290.79	14,946,411
VEA	Vanguard FTSE Developed Markets ETF	$70,890,342.19	11,045,860
QQQ	PowerShares QQQ	$67,213,495.24	43,176,758
IEFA	iShares Core MSCI EAFE ETF	$56,388,415.97	9,422,839
AGG	iShares Core U.S. Aggregate Bond ETF	$54,219,689.43	4,137,531
IEMG	iShares Core MSCI Emerging Markets ETF	$50,772,617.26	12,233,855
IJH	iShares Core S&P Mid-Cap ETF	$46,194,383.52	1,423,634
EEM	iShares MSCI Emerging Markets ETF	$44,073,104.83	71,103,703
IWM	iShares Russell 2000 ETF	$43,128,788.16	24,312,527
IWF	iShares Russell 1000 Growth ETF	$41,779,817.28	2,080,334
IJR	iShares Core S&P Small-Cap ETF	$38,675,402.63	3,269,331
VTV	Vanguard Value ETF	$37,655,473.68	1,829,128

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- It's hard to predict the direction (buy versus sell) of the resulting demand shocks?
- Liquidity is higher for the "cascade-prone" stocks.

Empirical Design

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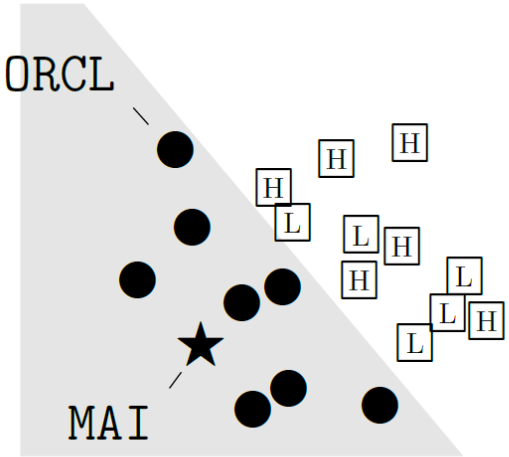
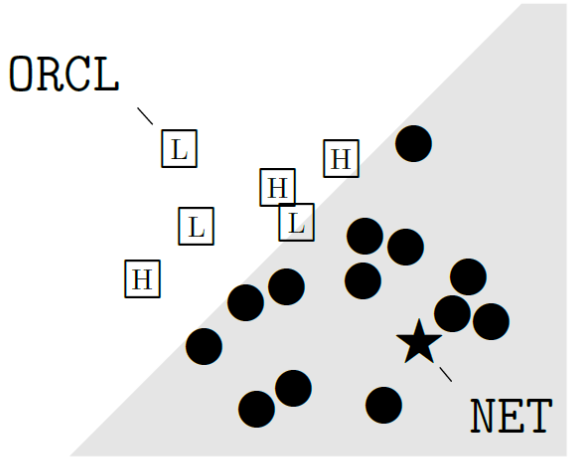
$$\begin{aligned}\ln(\texttt{etfRebalVlm}_{Z,t}) = \alpha &+ \beta \cdot \texttt{afterAncmt}_{A,t} \\ &+ \gamma \cdot \texttt{manyNbrs}_{A \to Z,t} \\ &+ \delta \cdot \{\texttt{afterAncmt}_{A,t} \times \texttt{manyNbrs}_{A \to Z,t}\} \\ &+ \cdots + \varepsilon_{A \to Z,t}\end{aligned}$$

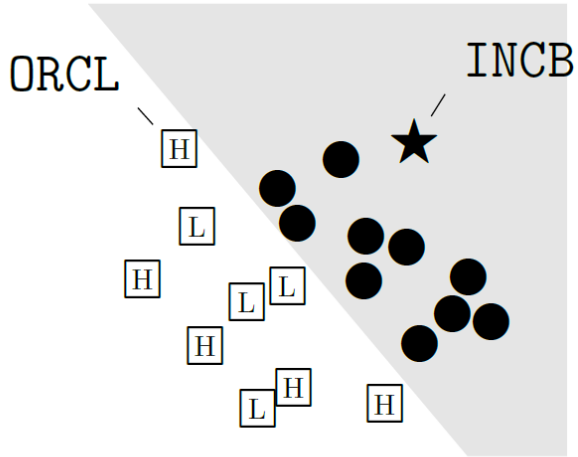
Empirical Design



Jul. 21, 2014



Jun. 19, 2012



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Alternative empirical strategy

- Define some "distance" from A to Z.
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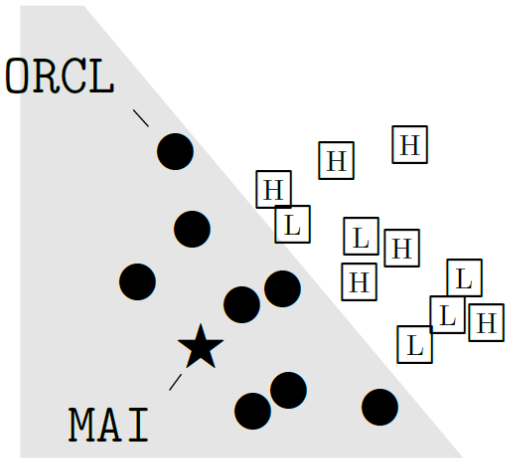

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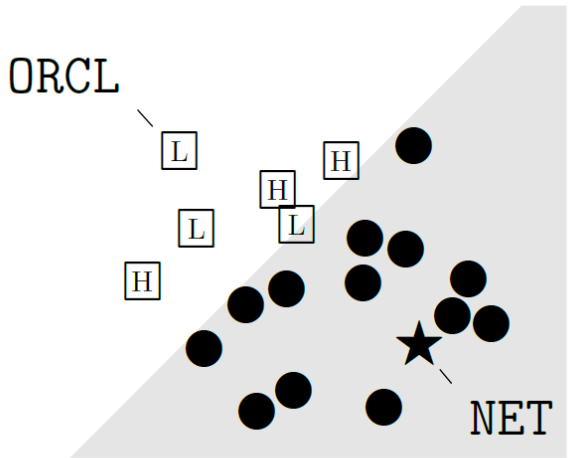

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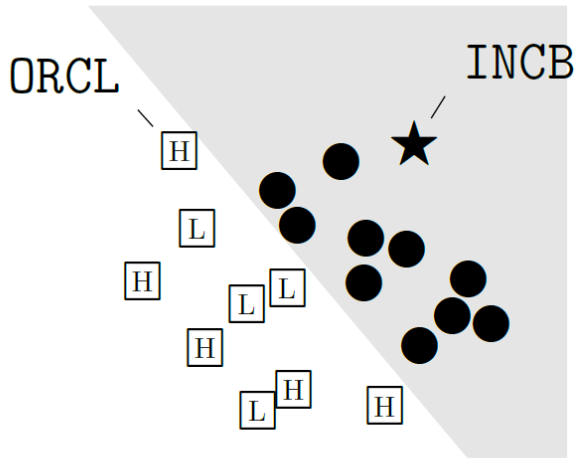

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ETF Order Imbalance

$$\texttt{etfOrdImbal}_{s,t} = \sum_{f=1}^{F} \frac{Q_{f,s,t} - \bar{Q}_{f,s,t}}{\texttt{etfRebal}_{s,t}} \tag{18}$$

This variable lies on the interval $[-1, 1]$. If $\texttt{etfOrdImbal}_{s,t} = -1$, then every share of stock s traded on day t was a sell order. Whereas, if $\texttt{etfOrdImbal}_{s,t} = 1$, then every share of stock s traded on day t was a buy order.

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$$\begin{aligned}\ln(\texttt{etfOrdImbal}_{Z,t}) = \alpha &+ \beta \cdot \texttt{afterAncmt}_{A,t} \\ &+ \gamma \cdot \texttt{manyNbrs}_{A \to Z,t} \\ &+ \delta \cdot \{\texttt{afterAncmt}_{A,t} \times \texttt{manyNbrs}_{A \to Z,t}\} \\ &+ \cdots + \varepsilon_{A \to Z,t}\end{aligned}$$

Buy or Sell?

Order Imbalance, Stock Z

	$\texttt{etfOrdImbal}_{Z,t}$ [bps]			
$\texttt{afterAncmt}_{A,t}$	0.75^{***} (0.11)	0.74^{***} (0.11)	0.63^{***} (0.16)	0.63^{***} (0.16)
$\texttt{manyNbrs}_{A\to Z,t}$			-0.92^{***} (0.10)	-0.87^{***} (0.10)
$\texttt{afterAncmt}_{A,t} \times \texttt{manyNbrs}_{A\to Z,t}$			0.24 (0.21)	0.22 (0.21)
$\ln(\texttt{vlm}_{Z,t})$		-1.25^{***} (0.08)		-1.24^{***} (0.08)
Announcement FE	Y	Y	Y	Y
Stock-Specific FE	Y	Y	Y	Y
R^2	1.4%	1.4%	1.4%	1.4%
Observations	13,755,851		13,755,851	

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- Front-running effectively "frontloads" some of the ETF rebalancing volume.
- Liquidity of Z may increase even before the date of M&A announcement of A.

Liquidity

Liquidity Measures, Stock Z

	$\texttt{amihud}_{Z,t}$ [%/\$1m]		$\texttt{baSpread}_{Z,t}$ [bps]	
$\texttt{afterAncmt}_{A,t}$	0.80	0.84	0.17^{***}	0.18^{*}
	(0.63)	(1.09)	(0.06)	(0.10)
$\texttt{manyNbrs}_{A\to Z,t}$		-4.61^{***}		-5.31^{***}
		(1.51)		(0.40)
$\texttt{afterAncmt}_{A,t} \times \texttt{manyNbrs}_{A\to Z,t}$		−0.09		−0.04
		(1.41)		(0.12)
Announcement FE	Y	Y	Y	Y
Stock-Specific FE	Y	Y	Y	Y
R^2	6.7%	6.7%	52.8%	52.9%
Observations	14,736,786		14,736,786	

Summary

- ETF rebalancing cascades can be large and far reaching.
- Thoughtful empirical analysis.
- Two suggestions:
  - An alternative empirical strategy.
  - A closer look at the predictability of the direction of ETF rebalancing cascade.