Taking Sides on Return Predictability

R. David McLean, Jeffrey Pontiff, and Christopher Reilly

ABFER Annual Meeting
May 25, 2021

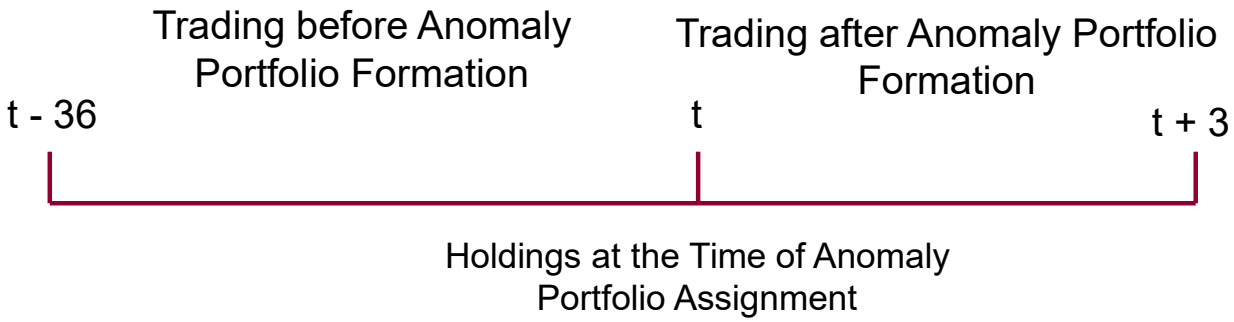
What We Do in this Paper

- We study the relations between trades made by retail investors, variables that predict the cross-section of stock returns (anomalies), and future stock returns.

- We ask whether retail investors trade with or against anomalies and whether their trades predict returns.

- In order to contextualize retail investors, we also investigate 8 other market participants some of which have been previously studied.
  - short sellers, firms, and 6 types of institutional investors

How We Relate Trading to Anomalies



What We Find

- Retail investors do the worst.
- Firms do the best.
- Short sellers also do well.
- Institutions' long positions are less clear.
- In particular, Hedge Fund's long positions surprisingly tend to trade against anomalies.

What Was Already Known in the Literature

- Retail Traders:
  - Over short horizons (e.g., 12 weeks or less) order imbalances appear profitable, whereas over long horizons they are unprofitable
- Institutions:
  - Edelen, Ince, and Kadlec (2016): wrong side of 7 anomaly portfolios 1-year prior to portfolio formation
  - Calluzzo, Moneta, and Topaloglu (2017): Active institutions and hedge funds do follow 14 anomaly strategies, but only after an anomaly is highlighted in an academic publication.
- Short Sellers:
  - Drake, Rees, and Swanson (2011) and McLean and Pontiff (2016): Short sellers short stocks that anomaly variables suggest should be shorted.
- Firms:
  - Baker and Wurgler (2002) and Pontiff and Woodgate (2008) find that firms trade against the profitability and size anomalies.

Methodology: Anomaly Variables

- We use a sample of 130 stock return anomalies that are documented in published academic studies.

- Sort stocks based on characteristics and define the long and short side of each anomaly strategy as the extreme quintiles produced by the sorts.

- Net is the difference between the number of long and short anomaly portfolios that a stock belongs to in a given month.

Methodology: Identifying Retail Trades

- We estimate retail trading using TAQ data via the methodology developed in Boehmer, Jones, and Zhang (2020)

- Retail orders, but not institutional orders, are internalized, receive subpenny price improvement, and thus transact at fractional cents.

- Boehmer et al. validate this metric with retail trade data used in Kelley and Tetlock (2013) and retail trades from NASDAQ

Constructing The Retail Trading Variables

- We calculate the daily percent of equity purchased by retail traders as (retail buys – retail sells) / shares outstanding

- We then aggregate these daily trade variables over various horizons ranging from 1-quarter to 3-years

- The identification method restricts our sample to 2006:10 through 2017:12.

Creating the Institution Groups

- Institutions:
  - Infer trades from changes in 13F and S12 holdings
  - Hedge Funds and Wealth Managers indentified using text criteria on their names
- Short Sellers:
  - Change in percentage of shares shorted as reported by Compustat
- Firms:
  - Net Issuances sinced such that net issuers “sell” and net repurchasers “buy”
- Who We Don’t Observe:
  - US Institutions who manage less than $100M
  - Foreign Institutions

Our Approach

- Perform quintile sorts based on Net and for each quintile calculate the average:
  - 1 Year trading prior to anomaly variable calculation and sorts
  - 3 Year trading prior to anomaly variable calculation and sorts
  - Ownership at the time of anomaly variable calculation and sorts
  - Trading in the quarter following anomaly variable calculation and sorts

- In all cases, t-stats calculated using Newey-West standard errors with 12 (36) lags are reported.

Trading 1 Year Prior To Anomaly Formation

	Prior 1-Year Trading						
	Net$_t$ Quintile						
Reported Variable:	**Lo**	**2**	**3**	**4**	**Hi**	**Hi - Lo**	**t-stat**
Retail Trading$_{t-11,t}$	0.10%	0.00%	-0.01%	-0.01%	-0.02%	-0.12%	-4.8
Mutual Fund Trading$_{t-11,t}$	-0.14%	-0.04%	0.01%	-0.02%	-0.19%	-0.06%	-0.2
Bank Trading$_{t-11,t}$	-0.14%	0.00%	-0.02%	-0.01%	-0.16%	-0.02%	-0.1
Insurance Company Trading$_{t-11,t}$	-0.08%	-0.05%	-0.13%	-0.06%	0.00%	0.08%	3.7
Wealth Management Trading$_{t-11,t}$	0.09%	0.11%	0.21%	0.24%	0.08%	-0.02%	-0.2
Hedgefund Trading$_{t-11,t}$	0.17%	-0.03%	0.06%	0.02%	-0.07%	-0.24%	-3.3
Other Institutional Trading$_{t-11,t}$	1.35%	0.75%	1.03%	0.88%	1.31%	-0.04%	-0.1
Short Seller Trading$_{t-11,t}$	-0.47%	-0.01%	0.03%	0.05%	0.11%	0.57%	4.3
Firm Trading$_{t-11,t}$	-4.68%	-3.58%	-4.08%	-3.45%	-3.39%	1.29%	6.0

Trading 3 Year Prior To Anomaly Formation

	Prior 3-Year Trading						
	Net_t Quintile						
Reported Variable:	**Lo**	**2**	**3**	**4**	**Hi**	**Hi - Lo**	**t-stat**
Retail Trading$_{t-35,t}$	0.22%	-0.05%	-0.06%	-0.06%	-0.05%	-0.26%	-4.6
Mutual Fund Trading$_{t-35,t}$	-0.23%	-0.24%	-0.03%	-0.22%	-0.77%	-0.55%	-1.1
Bank Trading$_{t-35,t}$	-0.54%	-0.13%	0.58%	-0.08%	-0.84%	-0.30%	-0.9
Insurance Company Trading$_{t-35,t}$	-0.17%	-0.18%	-0.29%	-0.16%	-0.15%	0.03%	0.8
Wealth Management Trading$_{t-35,t}$	0.27%	0.26%	0.51%	0.43%	0.19%	-0.08%	-1.5
Hedgefund Trading$_{t-35,t}$	0.75%	0.19%	0.30%	0.00%	0.03%	-0.71%	-2.9
Other Institutional Trading$_{t-35,t}$	5.42%	2.68%	2.56%	2.81%	3.11%	-2.30%	-5.4
Short Seller Trading$_{t-35,t}$	-1.26%	-0.08%	0.30%	0.23%	0.28%	1.54%	5.4
Firm Trading$_{t-35,t}$	-13.86%	-9.82%	-10.94%	-9.65%	-9.81%	4.05%	3.5

Net and Holdings

- Now we study contemporaneous holdings

- We cannot construct this measure for retail investors and firms, so this analysis is limited to institutions and short sellers

Net and Holdings

	Net_t Quintile						
Reported Variable:	**Lo**	**2**	**3**	**4**	**Hi**	**Hi - Lo**	**t-stat**
Mutual Fund Ownership$_t$	13.9%	6.1%	2.5%	6.7%	7.7%	-6.2%	-13.5
Bank Ownership$_t$	8.0%	5.3%	5.5%	6.3%	4.0%	-3.9%	-13.4
Insurance Ownership$_t$	2.2%	1.3%	1.1%	1.3%	1.1%	-1.1%	-21.3
Wealth Management Ownership$_t$	1.6%	1.5%	1.7%	1.8%	1.2%	-0.4%	-7.2
Hedge fund Ownership$_t$	7.7%	5.1%	2.9%	5.2%	5.8%	-1.9%	-14.0
Other Institutional Ownership$_t$	39.4%	26.1%	19.5%	27.9%	26.2%	-13.3%	-29.8
Short Seller Ownership$_t$	-6.4%	-3.7%	-2.1%	-2.9%	-2.7%	3.6%	23.9

Do the Market Participants Condition on Anomaly-Information?

- The previous trading related Net to lagged trading and contemporaneous holdings

- We now switch things around, and relate Net to future trading

Future Trading and Net

	Net_t Quintile						
Reported Variable:	**Lo**	**2**	**3**	**4**	**Hi**	**Hi - Lo**	**t-stat**
Retail Trading$_{t,t+3}$	0.00%	-0.01%	-0.02%	-0.01%	-0.01%	-0.01%	-2.1
Mutual Fund Trading$_{t,t+3}$	-0.14%	-0.02%	-0.05%	-0.06%	-0.04%	0.10%	1.1
Bank Trading$_{t,t+3}$	-0.08%	-0.01%	0.10%	-0.04%	-0.02%	0.06%	1.2
Insurance Company Trading$_{t,t+3}$	-0.03%	-0.02%	-0.01%	-0.03%	0.00%	0.03%	3.5
Wealth Management Trading$_{t,t+3}$	0.02%	0.03%	0.08%	0.09%	0.01%	-0.01%	-0.2
Hedgefund Trading$_{t,t+3}$	0.01%	-0.02%	0.04%	0.02%	-0.04%	-0.04%	-2.1
Other Institutional Trading$_{t.t+3}$	0.18%	0.14%	0.28%	0.30%	0.33%	0.16%	1.4
Short Seller Trading$_{t,t+3}$	0.01%	-0.01%	-0.03%	-0.03%	-0.03%	-0.05%	-1.4
Firm Trading$_{t.t+3}$	-0.94%	-0.84%	-0.78%	-0.86%	-0.84%	0.10%	1.7

Returns Regressed on Trading

- We now study how each group's trades predicts returns
- We estimate monthly Fama-Macbeth regressions of returns on lagged trades

Returns Regressed on Trading

Dependent Variable: $Return_{t+1}$	
Net_t	2.51***
	(3.94)
$Retail\ Trading_{t-35,t}$	-952.69***
	(-3.39)
$Mutual\ Fund\ Trading_{t-35,t}$	-21.98
	(-0.79)
$Bank\ Trading_{t-35,t}$	-86.57
	(-1.37)
$Insurance\ Company\ Trading_{t-35,t}$	43.79
	(0.58)
$Wealth\ Management\ Trading_{t-35,t}$	-85.40
	(-0.42)
$Hedge\ fund\ Trading_{t-35,t}$	10.20
	(0.35)
$Other\ Institutional\ Trading_{t-35,t}$	-6.10
	(-0.17)
$Short\ Seller\ Trading_{t-35,t}$	264.54***
	(4.11)
$Firm\ Trading_{t-35,t}$	25.63*
	(1.84)
$Weekly\ Order\ Imbalance_t$	58.11***
	(10.62)
$log(Size_t)$	5.55*
	(1.72)
$log(Price_t)$	-4.57
	(-0.76)
Constant	80.90**
	(2.20)
Lags for Newey-West SE's	36
No. Time Periods	99
N	276,930

Anomalies and Trading Return-Predictability

- Can anomaly return-predictability explain relations between trading and future stock returns?
  - In the earlier tables, we control for anomaly predictability with the composite anomaly variable Net.
  - In this table, we take the 130 anomaly variables used to create Net, and regress stock returns on the entire 130.
  - We then take the residual from that regression, and regress it on the variables used in the earlier tables.

Anomalies and Trading Return-Predictability

Dependent Variable: Return Residual$_{t+1}$	
Retail Trading$_{t-35,t}$	-817.64***
	(-4.62)
Mutual Fund Trading$_{t-35,t}$	-43.88
	(-1.39)
Bank Trading$_{t-35,t}$	59.14
	(0.64)
Insurance Company Trading$_{t-35,t}$	77.03
	(1.29)
Wealth Management Trading$_{t-35,t}$	-67.33
	(-0.32)
Hedge fund Trading$_{t-35,t}$	35.48
	(1.31)
Other Institutional Trading$_{t-35,t}$	-11.61
	(-0.42)
Short Seller Trading$_{t-35,t}$	108.98
	(1.19)
Firm Trading$_{t-35,t}$	-19.80
	(-1.55)
Weekly Order Imbalance$_{t}$	54.87***
	(10.13)
log(Size$_{t}$*)*	-3.04
	(-0.90)
log(Price$_{t}$*)*	7.58
	(0.84)
Constant	152.98***
	(4.08)
Number of Lags for Newey-West Standard Errors	36
No. Time Periods	98
N	275,729

Conclusions

- Firms and short sellers appear to be the smart money
  - Firms and short sellers generally trade with anomalies and their trades predict returns in the intended direction
  - Short sellers seem to unwind their position more quickly than firms

- Retail investors do the worst
  - They trade against anomalies and their trades predict returns in the wrong direction

- Institutions are relatively neutral
  - Long-side positions contradict anomalies
  - Hedge Fund's trading (in long positions) contradict anomalies
  - Institutional trades do not predict returns consistently