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# Tracking Retail Investor Activity

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# Retail vs. Institutional



"WE'VE DECIDED TO TELL INDIVIDUALS WE TREAT THEM LIKE INSTITUTIONS, AND TELL INSTITUTIONS WE TREAT THEM LIKE INDIVIDUALS."

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# The role of retail traders

- Are retail investors informed? Do they make systematic mistakes in their trading decisions?
    - Can they predict future returns?
    - Are they trading in the wrong directions?
  - Conflicting results:
    - Barber and Odean (2000, 2002, 2008, 2009)
    - Boehmer, Jones and Zhang (2008)
    - Kelley and Tetlock (2013)
    - Barrot, Kaniel and Sraer (2016)
  - The challenge: How to track retail investors?
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# Tracking Retail Investors: Trade Size

- Historically, small trades were more likely to come from retail customers, while institutions were likely behind the larger reported trades
    - Lee and Radhakrishna (2000) use a \$20,000 cutoff
  - Once algorithms become an important feature of institutional order executions in the early 2000's, "slice and dice" becomes the norm of institutional trades.
    - During our recent sample period retail order flow actually has a slightly larger average trade size compared to other order flow.
  - **Problem: trade size doesn't seem to be a good proxy nowadays.**
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# Tracking Retail Investors: Proprietary Datasets

- Barber and Odean (2000) analyze data from a single U.S. retail brokerage firm.
  - Kaniel, Saar and Titman (2008) and Boehmer, Jones and Zhang (2008) use proprietary account-type data from the NYSE during the early 2000's.
    - A small market share of overall retail order executions.
  - Kelley and Tetlock (2013) have data from a single U.S. wholesaler.
  - Barrot, Kaniel and Sraer (2016) have data from one French brokerage firm.
  
  - **Problem 1: These datasets are not publicly available.**
  - **Problem 2: Relatively small subsets of overall retail order flow.**
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# Our Data

- Publicly available
  - Covers substantial amount of retail order flow
  - Easily implementable
  - Can be used to study retail investors with respect to:
    - Behavioral biases
    - Amount and nature of their information
    - Seasonality and time-series properties
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# Handling of Retail Market Orders

- Most equity orders initiated by retail investors never go to the NYSE, Nasdaq, or another exchange.
  - The vast majority of marketable retail orders are executed by:
    - *Internalization*: filled from the broker's own inventory
    - *Wholesalers*: broker has made arrangements to route orders to an entity such as Knight, Citadel, UBS.
  - Off-exchange orders executed internally or by wholesalers are almost always reported to a FINRA Trade Reporting Facility (TRF)
    - included in the "consolidated tape" of all reported transactions as exchange code "D".
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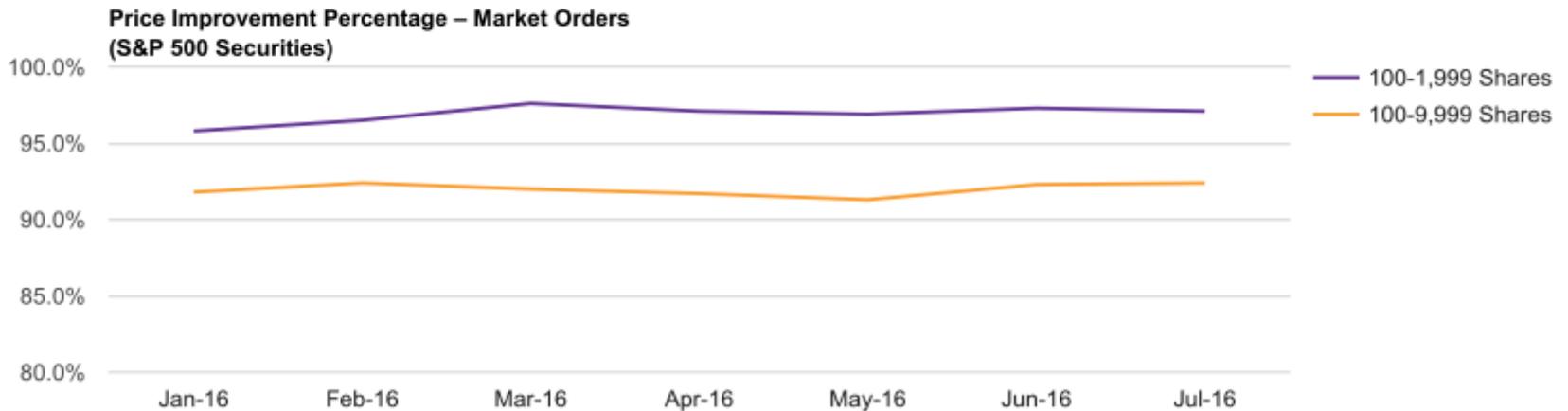
# Subpenny Price Improvement

- For orders executed internally or by a wholesaler, the retail customer often receives a price that is a fraction of a penny per share better than the prevailing NBBO (national best bid or offer price).
    - Ex: for a retail sell, the internalizing or wholesaling counterparty often agrees to pay slightly more than the National Best Bid.
    - This price improvement is typically only a small fraction of a cent. Common price improvement amounts: 0.01, 0.1 cents.
    - Allows broker to claim that the customer did better than if the order had been sent to an exchange.
  - But broker still makes money on this:
    - Receives payment for order flow from wholesaler
    - On internalized trades, broker is likely to earn some bid-ask spread even with price improvement.
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# Ex: From the Scottrade Website

Most retail orders are price-improved.

Price improvement reflects real savings passed on to you and underscores our commitment to providing a consistent, quality execution experience.



Other on-line discount retail brokers provide very similar statistics.

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# Retail vs. Institutional Subpennies

- Subpenny price improvements are not a feature of institutional order executions.
    - Reg NMS prohibits orders from having subpenny limit prices.
    - Internalizers and wholesalers go to great lengths to avoid interacting with institutional order flow.
  - Exception: Reg NMS allows executions at the quote midpoint.
    - As a result, institutions often use crossing networks and midpoint peg orders that generate transactions at the midpoint price.
    - Quoted spread is now typically 1c per share, so many transactions are reported at a half-penny.
    - Some dark pools and crossing networks also allow negotiation around the midquote, so “midpoint” prints can be 0.4-0.6 cents.
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# Our Retail Identification Strategy

- For all trades reported to a FINRA TRF (exchange code 'D' in TAQ)
    - Suppose  $Z_{it}$  is the fraction of a penny associated with transaction price  $P_{it}$ .
    - If  $Z_{it}$  is in the interval  $(0,0.4)$ , it indicates a retail seller-initiated transaction.
    - If  $Z_{it}$  is in the interval  $(0.6,1)$ , it indicates a retail buyer-initiated transaction.
    - Transactions at a round penny ( $Z_{it} = 0$ ) or near the half-penny ( $0.4 \leq Z_{it} \leq 0.6$ ) are not assigned to the retail category.
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# More on Data and Sample

- We merge TRF transaction data from TAQ with stock return data and accounting data from CRSP and Compustat, respectively.
  - We only include common stocks with share code 10 or 11 (which excludes mainly ETFs, ADRs, and REITs) listed on the NYSE, NYSE MKT (formerly the AMEX), or Nasdaq.
  - We remove low-priced stocks by requiring the minimum stock price to be \$1 from previous month-end.
  - Our sample period is from January 3, 2010 to December 31, 2015.
  - On each day, we have on average 3200 firms included in the sample.
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# What Explains Retail OIBs?

Dep.var	oibvol	
	Coef.	t-stat
Intercept	-0.4013	-21.19
Own lag	0.2200	99.34
Ret (w-1)	-0.9481	-42.39
Ret (m-1)	-0.2778	-20.39
Ret (m-7, m-2)	-0.0586	-12.10
lmt0	0.0003	5.59
lvol	0.8100	8.75
size	0.0154	12.76
lbn	-0.0275	-18.52

- Retail traders are contrarians. Why?
  - Either they have information.
  - Or trade against other traders and thus provide liquidity.
  - Or both.
  - Or trade systematically into the wrong direction.

# Predicting the Cross-section of Future Stock Returns

reg Dep. var	I Bidask return		II CRSP return	
	Coef.	t-stat	Coef.	t-stat
Intercept	0.0050	2.58	0.0056	2.85
<b>Oib (w-1)</b>	<b>0.0009</b>	<b>15.60</b>	<b>0.0010</b>	<b>16.29</b>
Ret (w-1)	-0.0185	-5.83	-0.0220	-6.85
Ret (m-1)	0.0006	0.35	0.0006	0.34
Ret (m-7, m-2)	0.0008	1.16	0.0008	1.16
lmt0	0.0000	-3.37	0.0000	-3.76
lvol	-0.0223	-1.41	-0.0205	-1.31
size	-0.0001	-0.86	-0.0001	-0.92
lbn	-0.0001	-0.39	0.0000	-0.07
Interquartile	1.1888		1.1888	
Return diff	0.1089%		0.1144%	

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# Retail OIB Predicts Returns in the Cross-Section

- Retail order imbalance strongly and positively predicts one-week ahead stock returns.
  - The inter-quartile range for oibvol is 1.19 per week. Multiplying this by the regression coefficient of 0.0009 generates a weekly return difference of 9.96 basis points (or 5.12% per year annualized).
  - Similar for other return measures.
  - Predictability persists over at least three months.
  - As a group, these retail investors are informed traders.
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# **OTHER EVIDENCE**

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# Subgroup Analysis

- Returns are most predictable for small, low price, low turnover firms.
  - But returns are still significant for large firms!
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# Long-Short Portfolios

- Buy the stocks in the highest quintile of order imbalance (the most retail buys), short the lowest quintile (the most retail sells).
  - Report value-weighted raw and risk-adjusted FF3 returns.
  - Given the overlapping data, we adjust the standard deviations of the portfolio return time-series using Newey-West (1987) with the corresponding number of lags.
  - 5% to 25% alpha. Mostly significant. No evidence of reversals. Results slightly noisier than FMB results.
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# Market Timing Ability of Retail Traders

- We regress future aggregate returns on aggregate retail order imbalance.
  - No evidence that retail investors can predict future market returns or future returns in broad-market ETFs.
  - Although retail investors display stock selection skills, they do not seem to be able to do market timing.
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# Market Conditions

- Barrot et al. find that retail traders are relatively more informed during market stress period.
  - We find VIX has no impact on the predictive power of our retail OIB.
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# The Information in Odd Lots

- We find nothing special going on in odd lot orders.

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# The Magnitude of Price Improvement and Future Return

- Retail OIB is more informative when PI is small
  - This means that brokers can predict the information content of incoming orders.
  - This, in turn, means internalizers can price discriminate against more informed retail traders.
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# Conclusions

- We provide an easy way to use recent, publicly available U.S. equity transaction data to identify retail purchases and sales.
  - Based on resulting retail order imbalances, we find that retail investors are informed at horizons up to 12 weeks.
  - Stocks with net buying by retail investors outperform stocks with negative imbalances; the magnitude is approximately 20 basis points over the following week, or 10% per year annualized for the smallest third of firms, or about half that for the largest firms.
  - Retail investors are better informed in smaller stocks with lower share prices. However, they do not exhibit any market timing ability.
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# The Barber and Odean Series

- Barber, Brad M., and Terrance Odean, 2000, Trading is hazardous to your wealth: The common stock investment performance of individual investors, *Journal of Finance* 55, 773–806.
  - Barber, Brad M., and Terrance Odean, 2002, Online investors: Do the slow die first? *Review of Financial Studies* 15, 455–488.
  - Barber, Brad M., and Terrance Odean, 2008, All that glitters: The effect of attention and news on the buying behavior of individual and institutional investors, *Review of Financial Studies* 21, 785–818.
  - Barber, Brad M., Yi-Tsung Lee, Yu-Jane Liu, and Terrance Odean, 2009, Just how much do individual investors lose by trading? *Review of Financial Studies* 22, 609–632.
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# Some Theoretical Guidance

- Black (1986)
    - Retail traders: are they noise traders?
    - Noise traders make trades possible, because they allow those who have information to be paid.
  - Shleifer and Summers (1990)
    - Some investors are not fully rational and their demand for risky assets is affected by their beliefs or sentiment that are not fully justified by fundamental news.
    - Results: limits to arbitrage, sentiment might be priced.
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# Research Questions

- Are retail investors informed? Do they make systematic mistakes in their trading decisions?
    - Can they predict future returns?
    - Are they trading in the wrong directions?
  - Conflicting results:
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