

Disposition bias and overconfidence in institutional trades

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Overconfidence

- *Odean (1999)* - individual investors trade too much: profitability of buys does not exceed profitability of sells
- Overestimation of the precision of their information

**Research question 1:
do institutional traders exhibit overconfidence?**

Disposition bias

- *Odean (1998)* - individual investors are reluctant to sell their losers

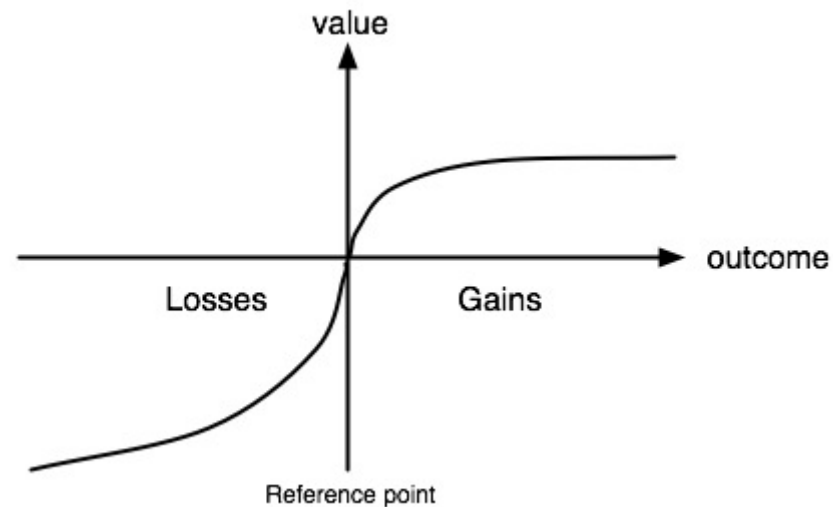
Mixed empirical evidence for institutional investors:

- *Grinblatt & Keloharju (2001); Shapiro & Venezia (2001); Garvey & Murphy (2004); Locke & Mann (2005); Frazzini (2006); Jin & Scherbina (2006)*:
→ confirm existence of disposition bias in institutional context
- *O'Connell & Teo (2004); Cici (2005); Feng & Seasholes (2005)*:
→ reject disposition hypothesis for institutional traders

Research question 2:
do institutional traders exhibit disposition behaviour?

The origin of disposition behaviour

- *Kahneman & Tversky (1979)*: prospect theory



Data

- Research project in cooperation with global custodian
- Transactional data of (anonymous) mutual funds
- Time period: 2002 – 2007
- International spread of trades
- 519 'equity' funds with 870,360 equity transactions (buy, sell, receipt free, delivery free)

Added value of the data set

- Transactional data allows to pinpoint exact trade moment (not possible with quarterly holdings)
- International spread (challenge US studies)
- Leading custodian: representative sample of mutual fund industry
- Accurate identification of buy and sell transactions

Methodology: overconfidence

Calculate average return of buy (sell) portfolio over 84, 252, 504 trading days following purchase (sale):

$$R_{P,T} = \frac{\sum_{i=1}^N \prod_{\tau=1}^T (1 + R_{j_i, t_i + \tau})}{N} - 1$$

N : number of purchases (sales)

T : holding period

$R_{j_i, t_i + \tau}$: return of security j corresponding to transaction i on day τ after transaction date t

Methodology: overconfidence

Significance testing by way of bootstrapping

Why? Fund trades are not independent over time; standard statistical inference relies on independence assumption

How?

- 1) Draw replacement securities from the same size decile and price-to-book quintile as the original traded security
- 2) Compute HPRs for replacement stocks and compute average buy-sell return difference
- 3) Repeat this procedure 1000 times
- 4) Construct bootstrapped empirical distribution of return differences
- 5) H_0 : return on purchased securities \geq return on sold securities
reject H_0 if observed return difference is less than α percentile of empirical distribution

Methodology: overconfidence

Calendar-time portfolios

- Consider all traded securities during formation period of 4, 12 , or 24 months
- Calculate equally-weighted portfolio return for month following formation period
- Roll-forward formation period by 1 month → time-series of monthly portfolio returns

Methodology: disposition

- Identify sell transactions and calculate realized gain/loss using as reference point the volume-weighted average purchase price
- Consider paper gains & paper losses using the Datastream high & low price:
 - If average purchase price < Datastream low price → paper gain
 - If average purchase price > Datastream high price → paper loss

Methodology: disposition

Calculate

$$PGR = \frac{n_{realized_gains}}{n_{realized_gains} + n_{paper_gains}}$$

$$PLR = \frac{n_{realized_losses}}{n_{realized_losses} + n_{paper_losses}}$$

Methodology: disposition

Significance testing

$$H_0: PLR \geq PGR$$

$$H_1: PLR < PGR$$

$$t - statistic = \frac{(PLR - PGR) - 0}{\sqrt{\frac{PGR(1 - PGR)}{n_{realizedgains} + n_{papergains}} + \frac{PLR(1 - PLR)}{n_{realizedlosses} + n_{paperlosses}}}}$$

Results: overconfidence

Panel A: all European, UK and US transactions

	Observations	HPR return over t trading days before transaction			HPR return over t trading days after transaction		
		t = 84	t = 252	t = 504	t = 84	t = 252	t = 504
Purchases	198625	7.27%	22.00%	52.67%	7.19%	19.77%	42.19%
Sales	159233	8.06%	21.16%	54.68%	7.17%	19.71%	43.50%
Difference	39392	-0.79%	0.84%	-2.01%	0.02%	0.06%	-1.32%
P value		0.2470	0.5260	0.3120	1.000	0.9990	0.0110

Results: overconfidence

Panel B: European subsample

	Observations	HPR return over t trading days before transaction			HPR return over t trading days after transaction		
		t = 84	t = 252	t = 504	t = 84	t = 252	t = 504
Purchases	28264	7.17%	23.72%	61.21%	8.15%	24.66%	51.74%
Sales	26208	7.48%	21.96%	67.58%	8.87%	24.79%	51.69%
Difference	2056	-0.31%	1.76%	-6.38%	-0.72%	-0.13%	0.05%
P value		0.3910	0.9570	0.1410	0.0040	0.6210	0.4340

Results: overconfidence

Panel C: UK subsample

	Observations	HPR return over t trading days before transaction			HPR return over t trading days after transaction		
		t = 84	t = 252	t = 504	t = 84	t = 252	t = 504
Purchases	117256	8.34%	23.43%	54.19%	8.54%	22.15%	46.33%
Sales	96479	9.96%	23.47%	54.87%	7.68%	20.89%	46.75%
Difference	20777	-1.62%	-0.04%	-0.68%	0.86%	1.25%	-0.42%
P value		0.000	0.4530	0.1350	1.000	1.000	0.1950

Results: overconfidence

Panel D: US subsample

	Observations	HPR return over t trading days before transaction			HPR return over t trading days after transaction		
		t = 84	t = 252	t = 504	t = 84	t = 252	t = 504
Purchases	53105	4.96%	18.00%	45.43%	3.62%	11.06%	25.75%
Sales	36546	3.46%	14.58%	45.95%	4.39%	11.04%	24.22%
Difference	16559	1.50%	3.41%	-0.52%	-0.77%	0.02%	1.52%
P value		0.9450	0.5800	0.3560	0.000	0.9890	1.000

Results: overconfidence

Calendar time portfolios

Formation period	4 months	12 months	24 months
Panel A: all transactions			
Average return buy-portfolio	0.91%	1.38%	0.85%
Average return sell-portfolio	1.13%	1.47%	0.89%
Difference buy-sell portfolio	-0.22%	-0.09%	-0.04%
P value	0.78	0.88	0.95

Results: overconfidence

Calendar time portfolios: CAPM regression

$$R_{Bt} - R_{St} = \alpha + \beta_{EUR} (R_{mt_EUR} - R_{ft_EUR}) + \beta_{UK} (R_{mt_UK} - R_{ft_UK}) + \beta_{US} (R_{mt_US} - R_{ft_US}) + \varepsilon_t$$

Formation period	4 months	12 months	24 months
Jensen's alpha	-0.001	-0.001	0.000
t-statistic	-0.728	-2.114	-1.070
beta Europe	-0.035	-0.049	-0.025
t-statistic	-0.415	-2.023	-0.907
beta UK	0.012	0.038	-0.004
t-statistic	0.141	1.494	-0.153
beta US	-0.125	0.016	0.041
t-statistic	-1.898	0.908	2.871

Results: disposition

	Equity funds (519 funds)
Realized gains	171745
Paper gains	6460333
Realized losses	70792
Paper losses	2303791
PLR	0.0298
PGR	0.0259
Difference in Proportions	0.0039
t-statistic	30.98

We cannot reject null hypothesis → fund managers seem to cut losses

Results: disposition

	Euro countries	UK	US
Realized gains	16742	56456	17900
Paper gains	456200	1804950	842710
Realized losses	4487	17643	10022
Paper losses	93413	647089	374269
PLR	0.0458	0.0265	0.0261
PGR	0.0354	0.0303	0.0208
Difference in Proportions	0.0104	-0.0038	0.0053
t-statistic	14.48	-16.20	17.62

Results: disposition

PGR and PLR for different reference points

	Average purchase price	Highest purchase price	First purchase price	Most recent purchase price	Prior maximum (3 months)	Prior maximum (6 months)	Prior maximum (1 year)	Prior maximum (2 years)	Last trading day of December
Realized gains	171745	127276	165374	167350	77592	64977	54403	42745	175257
Paper gains	6460333	4820776	6178900	6307068	2390291	1948219	1648283	1379944	6010470
Realized losses	70792	115193	77096	75133	193466	206083	210970	179707	89486
Paper losses	2303791	3736710	2504655	2430009	6122372	6685715	7045469	6600523	2607039
PLR	0.0298	0.0299	0.0299	0.0300	0.0306	0.0299	0.0291	0.0265	0.0332
PGR	0.0259	0.0257	0.0261	0.0258	0.0314	0.0323	0.0320	0.0300	0.0283
Difference in Proportions	0.0039	0.0042	0.0038	0.0041	-0.0008	-0.0024	-0.0029	-0.0035	0.0049
t-statistic	30.98	37.27	30.76	33.28	-6.20	-16.90	-19.38	-22.72	37.96

Results: disposition

Geographical benchmarks as reference point

	Euro countries	UK	US
Benchmark index	MSCI Europe	FTSE	S&P500
Realized gains	13756	37965	13105
Paper gains	387416	1278983	666727
Realized losses	7473	36157	14817
Paper losses	204998	1366843	667525
PLR	0.0352	0.0258	0.0217
PGR	0.0343	0.0288	0.0193
Difference in Proportions	0.0009	-0.0031	0.0024
t-statistic	1.79	-15.45	10.04

Conclusion

- Institutional traders seem to take more rational decisions than individual investors
- Generally, we cannot reject that the purchased securities perform better or equal than the sold securities (no overconfidence)
- Moreover, fund managers are not prone to the disposition bias and seem to cut losses early.
- However, regional differences exist between UK on the one hand and Europe and US on the other hand.