Which Behavioral Bias Causes Retail Investors to Underperform?

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2020-12-3

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Chinese Retail Investors Underperform the Market

	Cumret	
Big（>￥500k）	7.2891	+0.8151
Market	6.4739	
Small（<￥500k）	4.4187	-2.0552

Date：a sample of 50000 retail traders from a large brokerage house

What Causes Retail Investors to Underperform?

- We have documented many behavioral biases since 1980's:
  - Overtrading (Barber & Odean 2000, 2001)
  - Disposition effect (Shefrin & Statman 1985, Odean 1998)
  - Chasing winners (Barber & Odean 2008, Seasholes & Wu 2007)
  - Lottery preference (Barberis & Huang 2008, Bali et al. 2011)
  - ……
- **But which one matters?**
  - Our innovation: create hypothetical portfolios where we correct the biases one at a time.
  - Findings: disposition effect is the most important cause. Other biases barely matter.
- **Contributions:**
  - Introduces a unified framework to measure the harmful effect of behavioral biases.
  - Provides evidence that disposition effect is more harmful than the others.
  - Points the direction of future research on investor education—we should focus on fixing disposition effect because this is the most valuable improvement to the investors.

Performance Improvement of Correcting Each Bias

- We set the parameters so that 30% of one-way volume is affected by corrections.

		Cumulative Ret.	Daily Ret.(bps)	Daily Alpha (bps)
Market（2006-2016）		6.4739	8.8929	0
Small Investors		4.4187	6.7348	-0.5955
Gap		2.0552	2.1581	0.5955
Overtrading	Results	4.6751	7.1200	-0.3735
	Improvement	0.2564	0.3852	0.2220
	% of Gap	12%	18%	37%
Chasing Winner	Results	4.8404	6.9723	-0.3200
	Improvement	0.4216	0.2375	0.2755
	% of Gap	21%	11%	46%
Lottery Preference	Results	4.7548	6.8711	-0.2583
	Improvement	0.3360	0.1363	0.3372
	% of Gap	16%	6%	57%
Disposition 1	Results	5.5131	7.8843	-0.2386

Results on Odean's Sample

		Cumulative Ret.	Daily Ret.(bps)	Daily Alpha (bps)
Market（1991-1996）		2.5670	6.5735	0
Retail Investors		2.3288	5.9480	-0.3349
Gap		0.2382	0.6254	0.3349
		Cumulative Ret.	日回报(bps)	Alpha (bps)
Overtrading	Results	2.5126	6.4638	0.1466
	Improvement	0.1837	0.5158	0.4815
	% of Gap	77%	82%	144%
Chasing Winner	Results	2.3711	6.0212	0.0271
	Improvement	0.0423	0.0732	0.3620
	% of Gap	18%	12%	108%
Lottery Preference	Results	2.4616	6.2885	0.1721
	Improvement	0.1328	0.3404	0.5070
	% of Gap	56%	54%	151%
Disposition 1 (Selling	Results	2.7200	7.2503	0.6344
	Improvement	0.3912	1.3023	0.9693

Overtrading — Example

account_id	code	dollar_volume	tradequantity	tradeprice	date
12676	600513	26084	3000	8.695	20060301
12676	600513	13713	2100	6.53	20060322
12676	600513	16705	2500	6.682	20060324
12676	600513	19780	3000	6.5933333333	20060327
12676	600513	9870	1500	6.58	20060329
12676	600513	17325	2700	6.4166666667	20060331
12676	600513	12980	2000	6.49	20060403
12676	600513	11736	-1800	6.52	20060404
12676	600513	13190	-1000	6.58	20060405
12676	600513	20550	3000	6.85	20060412
12676	600513	53862	-8000	6.732875	20060413
12676	600513	20990	3200	6.559375	20060414
12676	600513	63519	-9600	6.6165833333	20060420
12676	600513	26474	-4000	6.6185	20060421
12676	600513	38999	5900	6.61	20060425
12676	600513	31362	4700	6.6727659574	20060426
12676	600513	21040	800	6.8	20060427

Overtrading — Correction

Mistake: Buy and sell the same stock repeatedly and frequently.
Correction: In a batch period, we assume all trades occur at the end-of-period price.

Date	Trade Quantity	Trade Price	Cash Flow
2020-01-13	500	5	-2500
2020-01-14	300	4.8	-1440
2020-01-15	-200	4.7	940
2020-01-16	-200	4.6	920
2020-01-16	100	4.65	-465
2020-01-17	100	4.8	-480

Date	Trade Quantity	Trade Price	Cash Flow
2020-01-13	500	4.7	-2350
2020-01-14	300	4.7	-1410
2020-01-15	-200	4.7	940
2020-01-16	-200	4.7	940
2020-01-16	100	4.7	-470
2020-01-17	100	4.7	-470

If the investor does not have timing ability, the correction should improve the performance.

Overtrading – Correction Results

%Volume changed	11.3%	34.7%	41.4%	44.4%	46.3%	49.8%	51.5%

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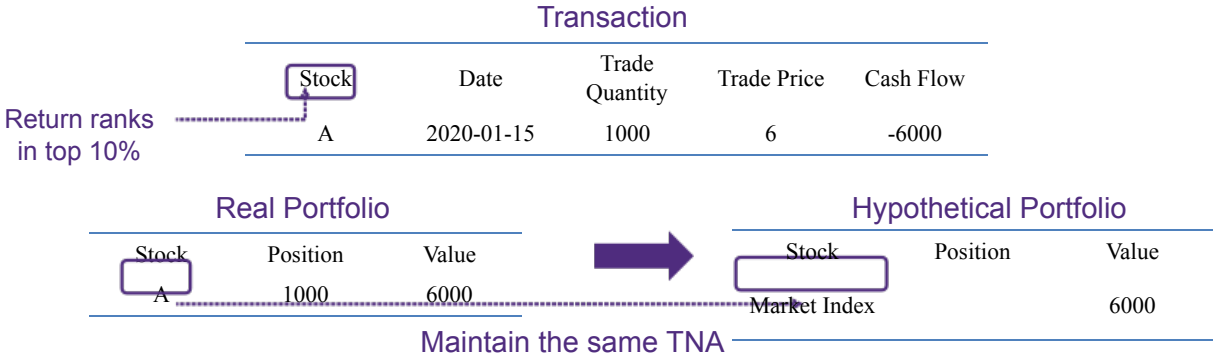
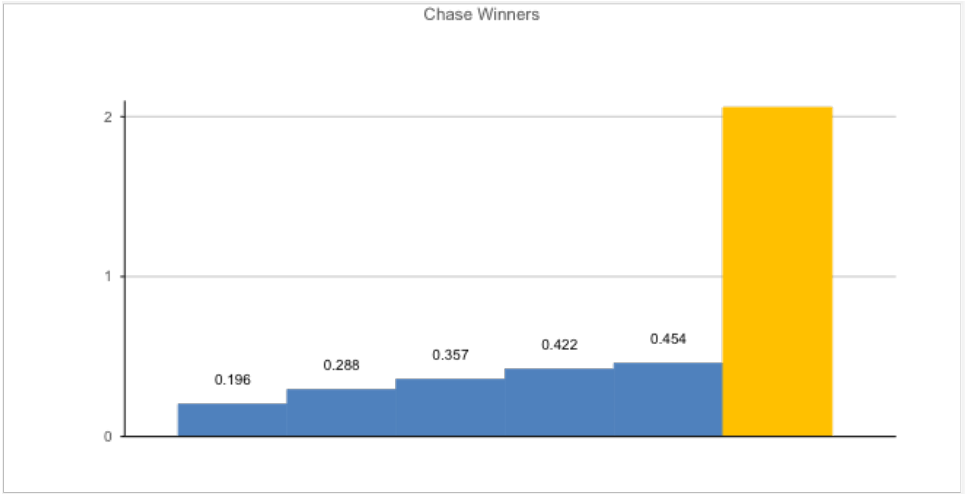
Chasing Winners and Lottery Bias — Correction

Mistake: Buy stocks that rank top in past return or MAX.
Correction: Assume the investor did not buy. Replace the holding with market index to maintain exposure.



Chase Winners – Correction Results



%Volume changed	5.4%	8.8%	11.8%	14.5%	17.0%

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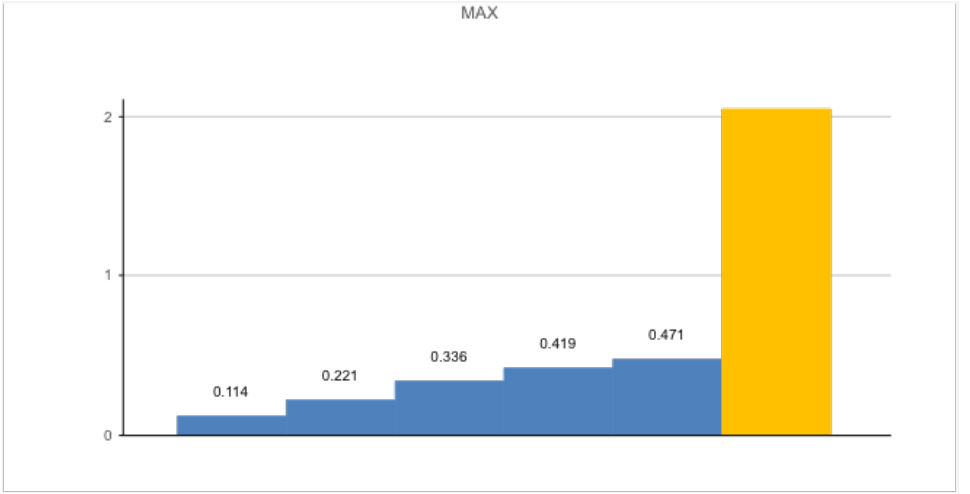
Lottery Preference – Correction Results



%Volume changed	5.6%	10.8%	16.5%	20.5%	23.1%

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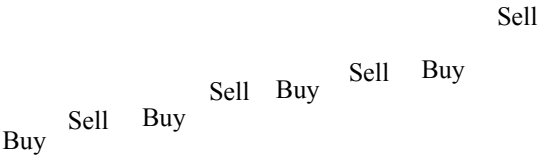
Disposition Effect — Example

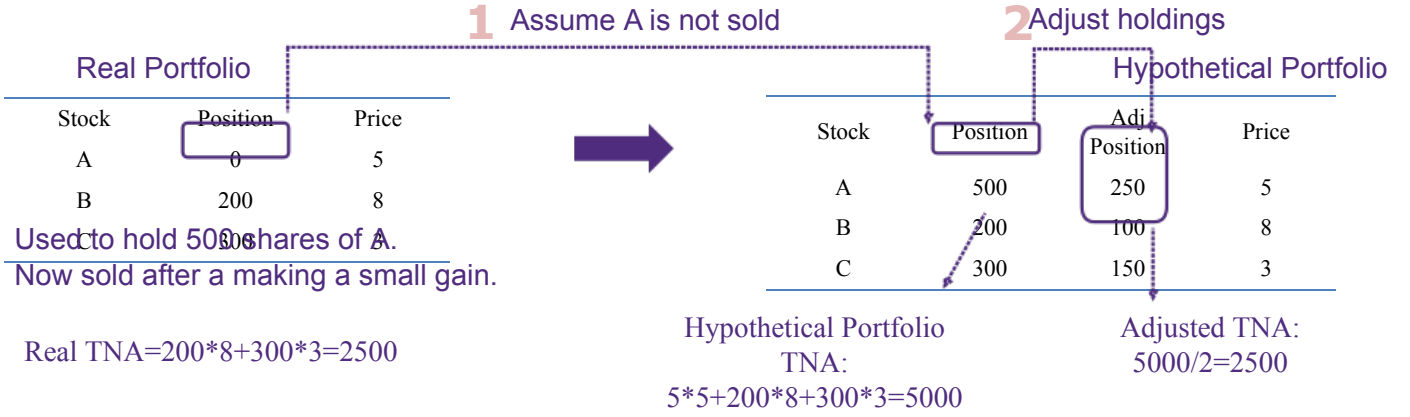
account_id	code	dollar_volume	tradequantity	tradeprice	date
112	600997	1878	300	6.26	20060317
112	600997	1935	-300	6.45	20060322
112	600997	3225	500	6.45	20060323
112	600997	3325	-500	6.65	20060410
112	600997	3330	500	6.66	20060411
112	600997	3410	-500	6.82	20060420
112	600997	3425	500	6.85	20060424
112	600997	3630	-500	7.26	20060425



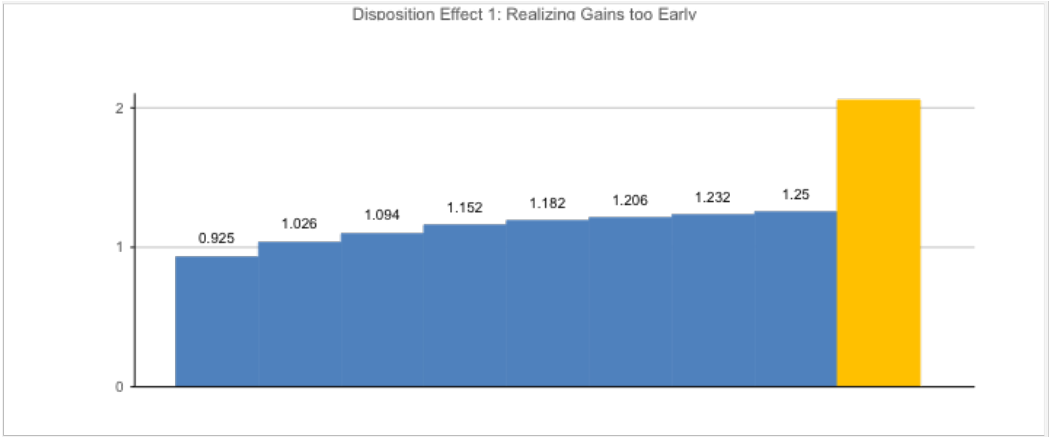
Disposition 1 (Selling Winners) — Correction

Mistake: Sell a winner stock too early.

Correction: When a stock with paper gain within [0, x%] is sold, assume it is not sold. Adjust the position of all holdings to maintain the same market exposure.



Disposition 1 (Selling Winners) – Correction Results



%Volume changed	9.7%	12.4%	14.7%	16.5%	18.1%	19.3%	20.4%	21.3%

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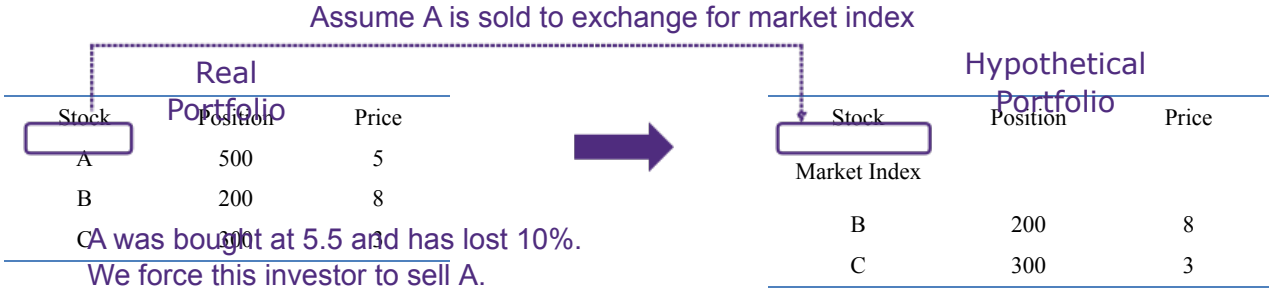
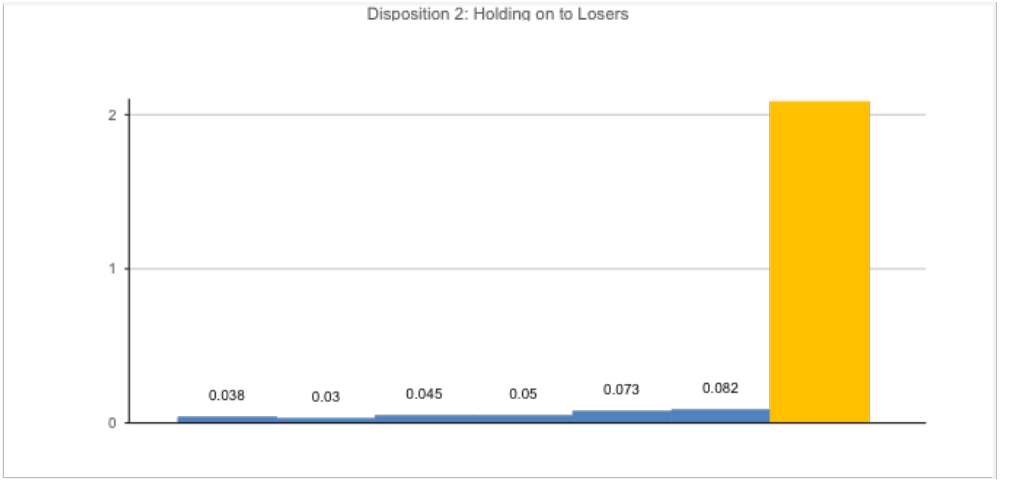
Disposition 2 (Holding Losers) — Correction

Mistake: Hold a losing stock for too long.

Correction: When a stock loses more than x%, we force the investor to sell the stock. Then we assume the investor use the sale proceeds to buy market index to maintain exposure.



Disposition 2 (Holding Losers) — Correction Results



%Volume changed	4.9%	5.7%	6.9%	8.9%	12.1%	17.9%

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Summary

- In two distinct samples, we find the same pattern that:
  - Selling winners too early is the main reasons why retail investors underperform.
  - Other behavioral biases do not matter much.

- Lessons to investors: let the winners run!