The Courage of Misguided Convictions

Brad M. Barber, Terrance Odean : Financial Analysts Journal (Nov/Dec 1999)

❖ OBJECTIVE AND MOTIVATION

We highlight two commons mistakes investors make :

- excessive trading
  → Overconfidence = 1st bias in investors
- disproportionately hold on to losing investments while selling winners
  → Desire to avoid regret = 2nd bias in investors

Daniel Bernouilli said : "people behave as if they are risk averse". Today, economists usually assume it.

Risk aversion and discounting future consumption are pervasive behaviors today, so they became standard assumptions in economic models.

- **Objective :**

Do empirical tests of the prediction of 2 behavioral finance theories due to the 1st and 2nd bias in investors :

- predict that investors will tend to hold their losing investments too long and sell their winners too soon because of their desire to avoid regret. *(Test from Shefrin and Statman in 1985 extended the prospect theory of Kahneman and Tversky in 1979).*

- predict that investors will trade too frequently and thereby reduce returns because of their overconfidence. *(Test from Odean in 1998).*

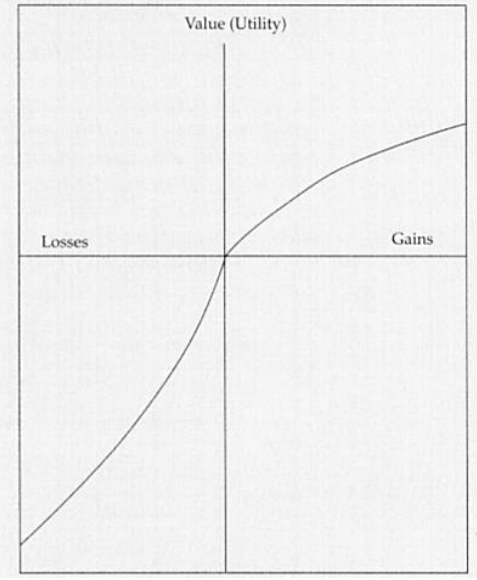
❖ THE DISPOSITION EFFECT (from Kahneman and Tversky's prospect theory)

When faced in simple, two- and three-outcome lotteries, people behave as if maximizing an S-Shaped value function.

(similar to a standard value function except that it is defined on the basis of gains and losses rather than level of wealth).

It is steeper for losses than for gains, which implies that people are generally risk averse.

Figure 1. Prospect Theory Value Function



- **Data used :**

They used Price and return data from the 1993 CRSP daily stock file for NYSE, Amex and Nasdaq stocks.

Primary dataset = 10 000 randomly selected accounts that were active (with at least 1 transaction) in 1987, including trading and position records from Jan. 1987 through Dec. 1993 (162 948 trades).

Variables = account identifier, buy/sell indicator, number of shares traded, commission paid, principal amount.

The tests were limited to stocks (for which this information was available).

➔ **Some numbers :**

Of the 10 000 accounts, we have :

- 6 380 made 97 483 common stock trades *(49 948 purchased and 47535 sales).*
- 62 516 332 shares were trades *(31 495 296 purchased with a market value of $530 719 264, and 31 021 036 sold with a market value of $579 871 104).*

The average monthly turnover was 6.5%.

- **Method :**

To test whether investors are disposed to sell winners and hold losers, therefore one must look at the frequency with which they sell winners and losers relative to their opportunities to sell each. They suppose investors are indifferent to selling winners or losers, and they are in an upward-moving market *(so they will have more winners in their portfolios and will tend to sell more winners than losers).*

By going through each account's trading records in chronological order, they constructed a portfolio of securities for which the purchase date and price are known *(this portfolio represented only part of each investor's total portfolio).* For each day that a sale took place in a portfolio of two or more stocks, they compared the selling price for each stock sold with its average purchase price to determine whether that stock was sold for a gain or a loss by comparing its high and low price for that day (as obtained from CRSP) with its average purchase price.

Different cases :

- If both its daily high and low were above its average purchase price : **gain**
- If they were both below its average purchase price : **loss**
- If its average purchase price lay between the high and the low : **neither a gain nor a loss**

(On days with no sales in an account, no gains or losses were counted).

Then, they calculated two ratios:

$$\text{Proportion of gains realized (PGR)} = \frac{\text{Realized gains}}{\text{Realized gains} + \text{Paper gains}};$$

$$\text{Proportion of losses realized (PLR)} = \frac{\text{Realized losses}}{\text{Realized losses} + \text{Paper losses}}.$$

Any test of the disposition effect is a joint test of the hypothesis that people sell gains more readily than losses and of the specification of the reference point from which gains and losses are determined.

- **Results :**

The data in this study show that investors did sell a higher proportion of their winners than of their losers :

Table 2. Proportion of PGR and PLR

Proportion Realized	All Months	January–November	December
PLR	0.098	0.094	0.128
PGR	0.148	0.152	0.108

Note: Realized gains, paper gains, realized losses, and paper losses were aggregated over 1987–1993 and across all accounts in the data set. The *t*-statistic tested the null hypotheses that, assuming that all realized gains, paper gains, realized losses, and paper losses result from independent decisions, the differences in proportions are equal to zero.

We can see the ratio PGR/PLR for the year is a little more than 1.5 → a stock whose value was up was more than 50% was more likely to be sold from day to day than a stock whose value was down.

The primary finding of these tests, that investors are reluctant to sell their losers and prefer to sell winners.

- **Alternative Reasons to Hold Losers and Sell Winners :**

We believe the disposition effect based on loss aversion best explains the tendency for investors to hold losers and sell winners.

- Anticipation of changes in tax law *(they anticipate a change in the tax law that will increase capital gains tax rates).*
- Desire to rebalance their portfolios.
- Belief that the losers will bounce back.
- Attempt to limit transaction costs *(investors' reluctance to sell losers may result from their sensitivity to higher trading costs at lower stock prices).*
- Belief that all stocks revert to the mean.

- **Robustness check :**

The results described are robust to out-of-sample testing. They obtained trading records for 78 000 households from 1991 to 1996 from the same discount brokerage house used for the previous study.

For this new data set, they found the PGR measure to be 0.1442 and the PLR measure to be 0.0863. During this sample period, stocks that had increased in value were approximately 65% more likely to be sold than stocks that had declined in value.

❖ OVERCONFIDENCE IN FINANCIAL MARKET

Odean showed that overconfident investors trade more than rational investors and that doing so lowers their expected utilities. Overconfidence increases trading activity because it causes investors to be too certain about their own opinions and to not consider sufficiently the opinions of others. The result is an increase in the heterogeneity of investors' beliefs which are needed to generate significant trading.

If in addition to being overconfident about the precision of their information, investors are overconfident about their ability to interpret information, they may incur trading losses beyond transaction costs.

Most individuals see themselves as better than the average person and as better than others see them. Taylor and Brown argued that exaggerated beliefs in one's abilities and unrealistic optimism may lead to "higher motivation, greater persistence, more effective performance, and ultimately, greater success". These beliefs can also lead to biased judgments.

- **Data used :**

The study tested whether a particular class of investors : those with accounts at discount brokerages, trade excessively, in the sense that their trading profits are insufficient to cover their trading costs.

They examined return horizons of 4 months, 1 year and 2 years following each transaction, and calculated returns from the CRSP daily return files. Market-adjusted returns were calculated as the security return less the return on the CRSP value-weighted index.

- **Method :**

To test for overconfidence in the precision of information, the approach was to determine whether the securities bought by the investors in this data set outperformed those they sold by enough to cover the costs of trading.

To test for biased interpretation of information, the approach was to determine whether the securities they bought underperformed those they sold when trading costs were ignored.

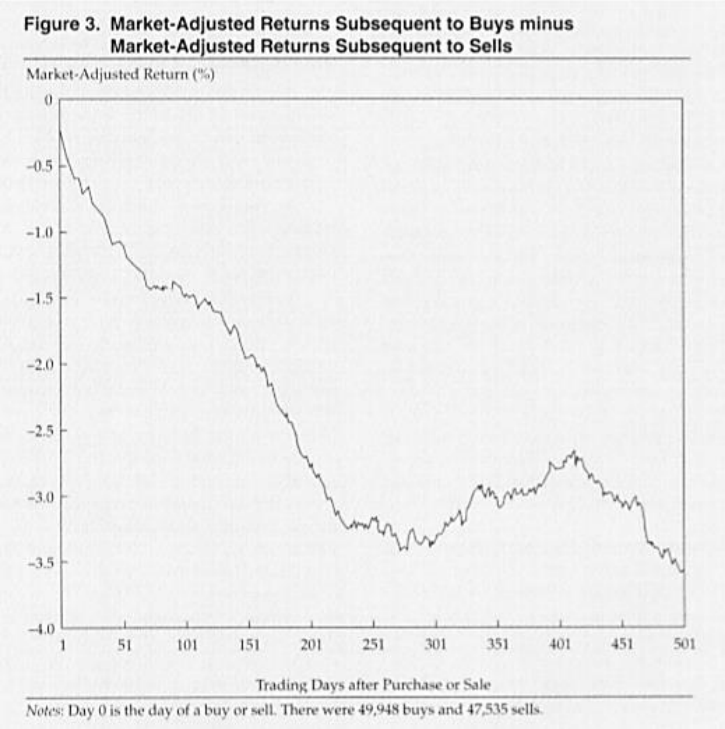
$$R_{P,T} = \frac{1}{N}\sum_{i=1}^{N}\left[\prod_{\tau=1}^{T}(1+R_{j_i,t_i+\tau}) - \prod_{\tau=1}^{T}(1+R_{VW,t_i+\tau})\right],$$

where

$R_{P,T}$ = the market-adjusted return on portfolio P from Day 1 to T

$R_{j,t}$ = the CRSP daily return for security j on date t

$R_{VW,t}$ = the daily return for the CRSP value-weighted market index on date t



1st hypothesis : over horizons of 4 months, 1 year and 2 years the average returns to securities bought minus the average returns to securities sold were less than the average round-trip trading costs of 5.9% *(it's expected if investors are overconfident about the precision of their information).*

1st null hypothesis : the expected returns to stocks purchased are at least 5.9% greater than the expected returns to stocks sold.

2nd hypothesis : for the same horizons (and ignoring trading costs), the average returns to securities bought were less than those to securities sold.

2nd null hypothesis : average returns to securities bought are greater than or equal to those sold.

- **Results :**

The 1st null hypothesis is comfortably rejected ($p < 0.001$ for all three horizons).

The 2nd null hypothesis is also comfortably rejected ($p < 0.001$ (4 months, $p < 0.001$ (1 year), and $p < 0.002$ (2 year)).

➔ These investors did not make profitable trades.

Conclusion : Overconfidence alone cannot explain these results. These investors appear to have had some ability to distinguish stocks that would subsequently perform better and worse.

❖ ADDITIONAL TESTS OF OVERCONFIDENCE

- **Data used :**

Trading and position records for 78,000 households with accounts at the same discount brokerage house that supplied the data described previously.

The records were from Jan. 1991 to Dec. 1996 and included all accounts at this brokerage for each household.

Of the sampled households, 66 465 had positions in common stocks during at least one month of the sample period. The remaining accounts held cash or held investments in securities other than individual common stocks.

- **Tests and results :**

- Tests involving performance in relation to turnover.

Prediction : the more overconfident investors are, the more they will trade and the more they will thereby lower their expected utilities.

If overconfidence is an important motivation for investor trading, then one would expect that, on average, those investors who trade most actively will most reduce their returns through trading. *(As reported in Barber and Odean study, this expectation is borne out).*

- Tests involving performance related to gender differences in investors.

To test directly the role of overconfidence in motivating trading, we partitioned our data into two groups : men and women.

Men have been found to be generally more overconfident than women.

Prediction : we expected men (the more overconfident group) to trade more actively than women and detract more than women from their net return performance. *(As reported in Barber and Odean study, we found this prediction to hold true).*

We found the differences in the turnover and performance of men and women to be highly statistically significant and robust to the introduction of other demographic variables, such as marital status, age, and income.

❖ REMARKS

As predicted, that investors tend to sell their winners and hold their losers. Also, as a result of overconfidence, investors trade to their detriment.

The overconfidence theory suggests that investors will trade more actively when their overconfidence is high. Psychologists find that people tend to give themselves too much credit for their own success and do not attribute enough of that success to chance or outside circumstance.

Gervais and Odean showed that this bias leads successful investors to become overconfident. So, in a market where most investors are successful, trading rises.

Our common psychological heritage ensures that we systematically share biases. We are disposed to hold our losers and sell our winners. And in our overconfidence, we act on our misguided convictions.