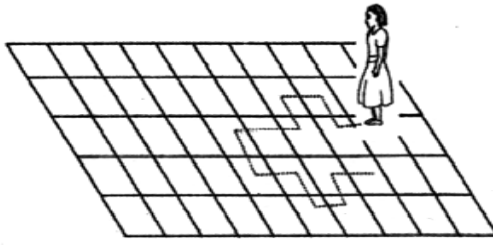


Random Walk?



Financial Market Behavior!

Human Behavior!



Momentum?



"HAVE YOU EVER INVESTED IN A CONTRARIAN FUND BEFORE, MR. GERSTEN?"

Contrarian?

"Theory says that past performance of prices is No guide to the future. Practice Says Otherwise.

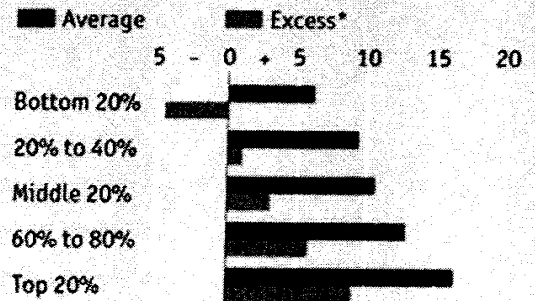
Momentum Effect

- * A pattern of returns that are correlated with the recent past.
- * Can last up to two years; become negatively correlated; reverting to the mean.

Contrarian Effect

Catching the wave

Annual returns from investing in US shares according to performance in past 12 months January 1927 to October 2010, %



Source: AQR Capital Management

*Over CRSP value-weighted index; adjusted for correlation with whole market

Why?

- * Caused by investors following the lead of others.
→ the collective sum of investors trading in the same direction results in irrational behavior.
- * Herding: Feel more comfortable when trading with the consensus of group.

* Two behavioral biases:

- ① Availability bias ← Recent information is given more important.
- ② Regret (or Fear of Regret) ← the feeling of missing an opportunity.

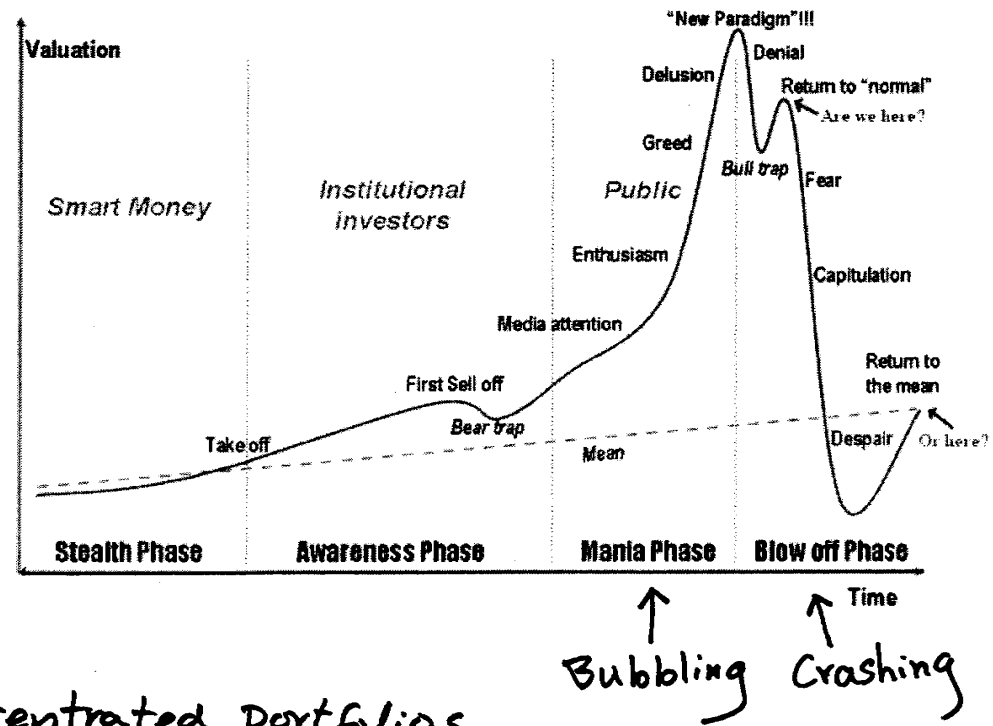
Bubbles and Crashes

Extended period of Prices that are at least two standard deviation from the mean.

4 phases of forming bubble and crashing.

Investor Behavioral Explanations:

- * Overconfidence → Concentrated portfolios
 - Excessive trading
 - Underestimate Risk
 - Ignore evidence that contradicts their beliefs.
- * Anchoring → Setting reference price (higher and higher)
- * Regret - Aversion → Don't miss the opportunity
- * Loss - Aversion → A reason for crashing



Cognitive Errors

* Ability limitations on Information processing.

Belief Perseverance

- ① Conservatism Bias
- ② Confirmation Bias
- ③ Representativeness Bias
- ④ Control (illusion) Bias
- ⑤ Hindsight Bias

Information Process

- ① Anchoring and Adjustment Bias
- ② Mental Accounting Bias
- ③ Framing Bias
- ④ Availability Bias

Bias Correction?

Maybe

Emotional Biases

* Attitude from Feeling and Intuition.

- ① Loss-Aversion Bias
 - Disposition Effect
 - Gambler's fallacy (Luck will turn)
- ② Overconfidence \approx illusion of knowledge
 - prediction overconfidence
 - Certainty overconfidence
- ③ Self-control Bias
 - ↳ Lack of discipline.
- ④ Status Quo Bias
 - ④.1 Endowment Bias
 - ④.2 Regret-Aversion

Bias Correction?

Maybe NOT

* Cognitive error: Belief Perseverance

* Definition:

→ Belief: Believe what your original belief.

→ Information: Relate "new" info to "old" info.
Place less value on New info.

* Consequence:

- ① Slow to react to new info.
- ② May hold losers too long.
- ③ Place too much weight on the base rates (prior prob.) and too little on the new info.

Q Assume you make an investment based on your own research. An adviser presents you with information that contradicts your belief about this investment. How would you respond?

* How to overcome?

- ① Need to know the existence of Bias.
- ② Learn to look carefully at new information itself.
- ③ May seek professional help.
- ④ Develop the IPS and follow that.

Confirmation Bias

Page
5

* Cognitive error: Belief Perservance

* Definition:

→ Belief: Believe what you want to believe.

→ Info.: Look for confirming evidence.

Q. You make an investment based on your hard-work of research. Suppose the investment does NOT move up as you believe. How are you likely to respond?

Conjunction Fallacy:

use unconditional prob. to support their belief without considering the joint impact.

e.g. $P(\text{stock fall in sept.}) = 55\%$

$P(\text{stock fall in the next 12 months}) = 70\%$

* The Fact is → $P(\text{stock fall next year}) = 0.55 \times 0.7$
 $= 38.5\%$

* Consequence:

- ① Ignore important information that against what you believe.
- ② Lead to under-diversified portfolios.
- ③ place too much confidence in the investment.
- ④ May lead to overweight on employer's stocks.

* How to overcome?

- ① Know the bias.
- ② make a conscious effort to seek out both confirming and contradicting information.
- ③ Use more than one method of analysis.
- ④ Develop IPS & Follow it.

* Cognitive Error: Belief Perservances

* Definition:

→ Believe your own interpretation and information Classification.

→ "If-then" (stereotype Heuristic)
Classification of information into
different categories.

Q Have you ever made a new investment because of its apparent "similarity" to a past successful investment (e.g. a high tech stock or value stock) without doing your own new research to validate the new investment's merits?

If-then Bias

Gambler's
Fallacy

Halo
Effect

Gambler's fallacy: If the market is continuously down for 5-day, then the chance to have an up market on 6th day must be high? → Mean-Reversion

Halo Effect: If a company with a good record of growth and the price performance, then this stock might be a good investment. → Momentum

Base-Rate
Neglect

Sample Size
Neglect

* Consequence:

- ① Too much focus on new information
- ② May classify information into incorrect categories.
- ③ May change investment strategy based on just a small sample of information.
- ④ Don't want to spend time to find out the truth.

* How to overcome?

- ① Knowing the existence of the bias.
- ② Don't jump in too fast; Do the homeworks by collecting more samples and performing base-rate analysis.
- ③ Use "Periodic Table of Investment Return" as a reference for investment classification.
- ④ Develop a good IPS (investment guide line) and follow that.

The Callan Periodic Table of Investment Returns

Annual Returns for Key Indices (1993–2012) Ranked in Order of Performance

	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012
MSCI Emerging Markets	74.84%	7.78%	38.13%	23.97%	36.52%	42.16%	66.42%	22.03%	14.02%	10.26%	56.26%	23.55%	34.34%	32.59%	39.76%	5.24%	79.02%	29.09%	7.84%	MSCI Emerging Markets 18.03%
MSCI EAFE	32.57%	3.13%	37.58%	22.96%	33.36%	28.58%	43.09%	11.63%	8.43%	-6.00%	46.54%	22.25%	13.54%	26.34%	11.17%	-26.92%	34.47%	26.85%	4.65%	Russell 2000 Value 18.05%
Russell 2000 Value	23.77%	1.32%	36.99%	22.00%	31.78%	20.00%	28.24%	6.08%	2.49%	-11.43%	47.25%	20.25%	5.82%	23.48%	9.13%	-33.79%	31.78%	24.50%	2.11%	S&P 500 Value 17.68%
Russell 2000 Value	18.88%	-0.64%	31.04%	21.37%	29.98%	14.69%	26.96%	-3.02%	-2.37%	-15.94%	46.03%	18.33%	4.91%	20.81%	7.05%	-34.92%	31.57%	19.20%	-0.48%	MSCI EAFE 17.32%
S&P 500 Value	18.61%	-1.54%	28.45%	16.49%	22.36%	8.70%	21.26%	-9.11%	-9.23%	-20.48%	38.59%	15.71%	4.71%	18.37%	6.97%	-37.00%	27.17%	15.10%	Russell 2000 Value 16.35%	
Russell 2000 Value	13.37%	-1.82%	25.75%	11.26%	12.95%	1.23%	21.04%	-14.17%	-11.71%	-20.85%	31.79%	14.31%	4.55%	15.79%	5.49%	-38.54%	26.47%	15.06%	Russell 2000 Value 16.00%	
S&P 500 Value	10.08%	-2.43%	18.46%	6.05%	9.64%	-2.55%	12.73%	-22.08%	-11.89%	-22.10%	28.68%	10.88%	4.15%	13.35%	1.99%	-39.22%	21.17%	15.05%	Russell 2000 Value 14.61%	
Barclays Agg	9.75%	-2.92%	11.21%	6.03%	1.78%	-6.45%	-0.82%	-22.43%	-12.73%	-23.59%	25.66%	6.13%	4.00%	11.01%	-1.57%	-43.38%	20.58%	7.75%	MSCI EAFE 14.59%	
S&P 500 Value	1.68%	-7.32%	-5.21%	3.64%	-11.59%	-25.34%	-1.49%	-30.61%	-21.44%	-30.26%	4.10%	4.34%	2.43%	4.33%	-9.78%	-53.18%	5.93%	6.54%	MSCI Emerging Markets -18.17%	
Barclays Agg																				Barclays Agg 4.21%

● **S&P 500** measures the performance of large capitalization U.S. stocks. The S&P 500 is a market-value-weighted index of 500 stocks that are traded on the NYSE, AMEX, and NASDAQ. The weightings make each company's influence on the index performance directly proportional to that company's market value.

● **S&P 500 Growth** and ● **S&P 500 Value** measure the performance of the growth and value styles of investing in large cap U.S. stocks. The indices are constructed by dividing the market capitalization of the S&P 500 Index into Growth and Value indices, using style "factors" to make the assignment. The Value Index contains those S&P 500 securities with a greater-than-average value orientation, while the Growth Index contains those securities with a greater-than-average growth orientation. The indices are market-capitalization-weighted. The constituent securities are not mutually exclusive.

● **Russell 2000** measures the performance of small capitalization U.S. stocks. The Russell 2000 is a market-value-weighted index of the 2,000 smallest stocks in the broad-market Russell 3000 Index. These securities are traded on the NYSE, AMEX, and NASDAQ.

● **Russell 2000 Value** and ● **Russell 2000 Growth** measure the performance of the growth and value styles of investing in small cap U.S. stocks. The indices are constructed by dividing the market capitalization of the Russell 2000 Index into Growth and Value indices, using style "factors" to make the assignment. The Value Index contains those Russell 2000 securities with a greater-than-average value orientation, while the Growth Index contains those securities with a greater-than-average growth orientation. Securities in the Value Index generally have lower price-to-book and price-earnings ratios than those in the Growth Index. The indices are market-capitalization-weighted. The constituent securities are not mutually exclusive.

● **MSCI EAFE** is a Morgan Stanley Capital International Index that is designed to measure the performance of the developed stock markets of Europe, Australasia, and the Far East.

● **MSCI Emerging Markets** is a Morgan Stanley Capital International Index that is designed to measure the performance of equity markets in 21 emerging countries around the world.

● **Barclays Aggregate Bond Index** (formerly the Lehman Brothers Aggregate Bond Index) includes U.S. government, corporate, and mortgage-backed securities with maturities of at least one year.

The Callan Periodic Table of Investment Returns 1993–2012

The Callan Periodic Table of Investment Returns conveys that the **case for diversification** across asset classes (stocks vs. bonds), investment styles (growth vs. value), capitalizations (large vs. small), and equity markets (U.S. vs. international) is strong.

While past performance is no indication of the future, consider the following observations:

- The Table highlights the uncertainty inherent in all capital markets. Rankings change every year. Also noteworthy is the difference between absolute and relative performance. For example, witness the variability of returns for large cap growth, when it ranked second from last for the six years from 2001 to 2006, or the variability in the ranking for fixed income over the last 10 years while returns remained bound in a relatively narrow range.
- Stock markets around the world rebounded smartly in 2012 after suffering through incredible volatility in 2011. Global economic growth remained subdued and policy uncertainty persisted in Europe and the U.S., unnerving investors. Nonetheless, equity markets broadly outperformed long-term averages and notched solid gains in the 15% to 20% range. The **U.S. stock market** generated 16%, with much of the gain recorded in a strong third quarter, and the **developed markets overseas** did even better (+17.32%). **Emerging markets** notched the highest return (+18.63%) among all asset classes displayed in the table during 2012, after suffering the worst loss in 2011 (-18.17%). After underperforming in four of the previous five years, **large cap value** (+17.68%) led the way in the U.S. large cap market, outperforming **growth** (+14.61%) by 3.07%.
- Reverting to long-term trends, **small cap** (+16.35%) beat large cap (+16.00%) stocks in 2012, the 11th time in the past 14 years. **Small cap value** (+18.05%) bested **small cap growth** (+14.59%) for the first time in four years.
- **Fixed income** (+4.21%) generated the lowest return among asset classes in 2012 after leading the pack in 2011. While muted, fixed income gains surprised on the upside, just as in 2010 and 2011. At the start of the 2012, yields remained exceptionally low (2.24% for the Barclays Aggregate). Economic growth was expected to lead to inevitably higher interest rates, and therefore weak performance for fixed income. However, investor confidence in the economic recovery wavered during the first half of 2012. Interest rates declined into the third quarter, with the yield on the Aggregate falling to 1.56% at the end of September, driving up bond prices and total returns. Yields backed up modestly in the fourth quarter, tempering total return for the year. The stage remains set for weak bond market performance should interest rates begin to rise.
- The Table illustrates several sharply distinct periods for the capital markets over the past 20 years. First, note the unique experience of the 1995–1999 period, when large cap growth significantly outperformed other asset classes and the U.S. stock market in general enjoyed one of its strongest five-year runs.
- The subsequent three years (2000–2002) saw consecutive declines in large cap stocks for the first time since 1929–1932. The S&P 500 suffered its largest loss since 1974, declining 40% from its peak in March 2000 through the end of 2002.
- Stocks recorded five years of gains from 2003–2007, led by particularly strong growth in emerging markets. Then the bottom fell out in 2008, and the U.S. stock market sustained its worst drubbing since the 1930s. Large cap stocks suffered the second-worst annual decline (-37.00%) since 1926.

This analysis assumes that market indices are reasonable representations of the asset classes and depict the returns an investor could expect from exposure to these styles of investment. In fact, investment manager performance relative to the different asset class indices has varied widely across the asset classes during the past 20 years.

Callan

Callan Associates Inc. was founded in 1973, Callan Associates Inc. is one of the largest independently owned investment consulting firms in the country. Headquartered in San Francisco, Calif., the firm provides research, education, decision support and advice to a broad array of institutional investors through four distinct lines of business: Fund Sponsor Consulting, Independent Adviser Group, Institutional Consulting Group, and the Trust Advisory Group. Callan employs more than 150 people and maintains four regional offices located in Denver, Chicago, Atlanta, and Summit, N.J.

Corporate Headquarters

San Francisco 800.227.3288

Regional Consulting Offices

Atlanta 800.522.9782

Chicago 800.999.3536

Denver 855.864.3377

Summit 800.274.5878

Note: A printable copy of The Callan Periodic Table of Investment Returns is available on our website at www.callan.com.

Illusion of Control Bias

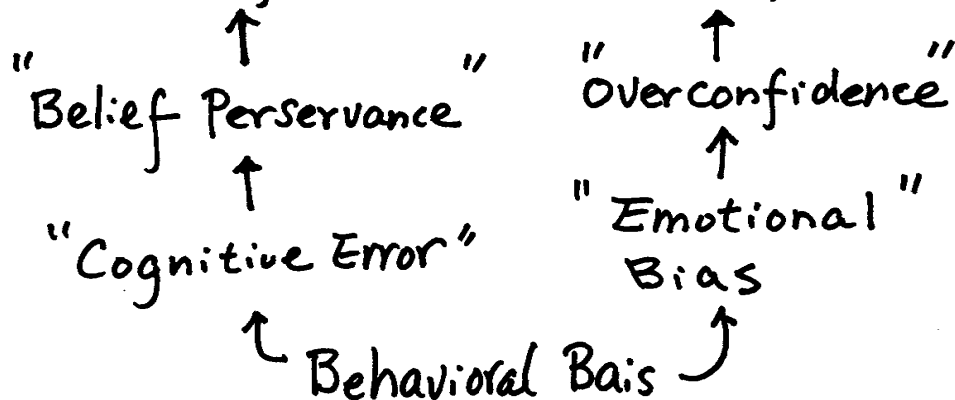
* Cognitive Error: Belief Pervasances

* Definition:

- Believe you can control outcomes.
- "Subjective probability" of Success is too High.

Q. You are offered two free lottery tickets. You may either select your own numbers or have a machine do it. What would you do?

Illusion of Control vs. Illusion of Knowledge



* Consequence:

- ① Excessive trading.
- ② Lead to concentrated (undiversified) investment.
- ③ Result inferior performance of investment.
- ④ May collect a large amount of unnecessary information or data.

* How to overcome?

- ① know the complexity of investment.
- ② Seek others' opinions; specially different or contrary opinions.
- ③ Keep trading records to see whether you are able to control your investment outcomes over time?

Hindsight Bias

* Cognitive Error: Belief Perservances

* Definition:

- Believe that you "knew" the outcomes before they did happen.
- Perceive past events or outcomes as expected.
- Remember just enough of their prediction that fits the past outcome.

Q. Befor the stock market opened, you observed stock index futures dropped significantly and you said to yourself "I bet the market is going down!". The stock market at the end of day was actually down more than 3%. What do you view about your prediction?

* Consequence:

- ① Lead to take excessive risk because of false sense of confidence.
- ② Ignore the fundamental value of information to the investment.
- ③ Toward ego defense mechanism.
- ④ Blind to future risk because of the memory of previous correct forecast (guess).

* How to overcome?

- ① Keep records of all forecast and see how accurate these forecasts were?
- ② Rely on investment strategies according to the IPS: NOT on your own prediction.
- ③ Knowing that markets move in cycles, so expectations must be managed.

Anchoring and Adjustment Bias

Page

10

* Cognitive Error: Information-Processing

* Definition:

→ Investors seem to be anchored to a reference value or number and then adjust the anchor to reflect new information.

→ Set up a target for interpreting New information.

Q When you purchase a stock at \$50/per share, do you set up a price (e.g. \$60/share) as a reference price for you to sell the stock?

Anchoring Trap: Analysts use their first-thought (first-information) to forecast or "guess".

* Consequence:

① Investors tend to remain focused on and stay close to their original forecasts; ignore the true information that affects the investment returns.

② Always relate new information to "target numbers".

* How to overcome?

① must know that any new information could be random and could be irrelevant to the original forecast or reference numbers or prices.

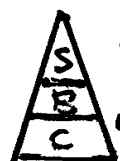
② Put less weight to historical (past) information.

Mental Accounting Bias

* Cognitive Error: Information - Process

* Definition:

→ Investors' investment influenced by their Mental Classification or Separation of Asset classes.



→ Instead of "total return" consideration, they separate investment by "Income" and "Capital gain" categories.

Q. Generally, do you categorize your money by different financial goals, or do you look at the bigger financial picture?

* Consequences:

- ① Ignore correlation among assets due to layer of investment.
- ② Fail to achieve optimal asset allocation.
- ③ Decrease portfolio value due to spending of current income.
- ④ May take too much risk by searching for high current income investment.

* How to overcome:

- ① Examine all investments as if they are parts of the same portfolio.
- ② Analyze asset correlations.
- ③ Total return consideration

Framing Bias

Page
12

* Cognitive Error: Information-Process

* Definition:

→ Investors' Interpretation of Information is influenced by how information was presented.

→ Answer a question differently depending on how it is asked.

Q. Assume you have agreed to a financial plan created by your adviser that has a projected return of 9% a year and the annual standard deviation of +/- 15% (a typical plan).

Would it surprise you to know that statistically in the worse case, the plan's return could be negative 36% or more in one year?

Would you re-consider your Risk-Tolerance?

* Consequences

- ① See only a part of the picture
- ② May incorrectly identify risk of investment.
- ③ have suboptimal asset allocation.
- ④ more risk averse when presented with a "gain" frame and more risk seeking when presented with a "loss" frame.

* How to overcome?

- ① Be neutral and openminded, when interpreting New information.
- ② focus on "Expected Return/Risk" rather than on "Gain/Loss".

Availability Bias

Page
13

* Cognitive Error : Information - Process

* Definition:

→ Fit to New Information by easily recalled Past Events.

- ① Retrievability ← influenced by name recognition or words of mouth.
- ② Categorization ← by familiarity
- ③ Narrow Range of Experience ← by own Experience
- ④ Resonance ← by preference (like or dislike)

Q. How do you select your investment brokers or your mutual funds?

Does the familiarity make you think or feel more comfortable?

* Consequences:

- ① make investment selection based on effects from Advertisement.
- ② Based on familiarity, investors limit investment opportunity set.
- ③ Lead to undiversified portfolio.
- ④ Overinvestment in Certain industries.

* How to overcome?

- ① Develop a suitable IPS by diligent research.
- ② Follow a long-term strategic approach.
- ③ Do not rely on just your preference and experience to interpretate New information.

Loss-Aversion Bias

* Emotional Bias

* Definition:

- Investors focus on "Not to lose money."
- Emotional fear of downside loss.
- Actually become "Risk Seeking" when facing downside loss.
- Reduction in utility caused by a "loss" is greater than the increase in utility caused by a "gain"
- Investors thus focus on potential gains/Loss rather than "Returns"

Note: Traditional Financial Theory assumes that investors are risk-averse (increasing expected utility but decreasing marginal utility) with respect to "Returns"

→ Disposition Effect

- ↑ hold the Losers too long
Sell the Winners too quickly
- ↑ may be due to the "Gambler's Fallacy" by assuming Luck will turn

→ House Money Effect

- ↑ Investors view profit (gain) as belonging to someone else and thus become less risk-averse when investing it.

→ Myopic Loss Aversion



- ↑ Investors overemphasize short-term gains/Losses and weight Losses much more heavily than gains

Loss - Aversion Bias

Q. Imagine you still hold an investment that dropped 25% in the last six months. You are NOT sure if it will come back. Will you sell it now or continuously hold it?

- ⑤ The more often evaluation of your investment, the more fear of Loss of your feeling.
- ⑥ Higher than theoretically justified short-term equity risk premium.

* Consequences :

- ① Disposition Effect that holding the losers too long (selling the winners too quickly)
- ② Limit growth of the portfolio.
- ③ Investors usually avoid assets experienced recent volatility due to "Myopic Loss-Aversion"
- ④ Investor tend to view stocks and bonds separately (stand alone) from "Time-framing Bias".

* How to overcome ?

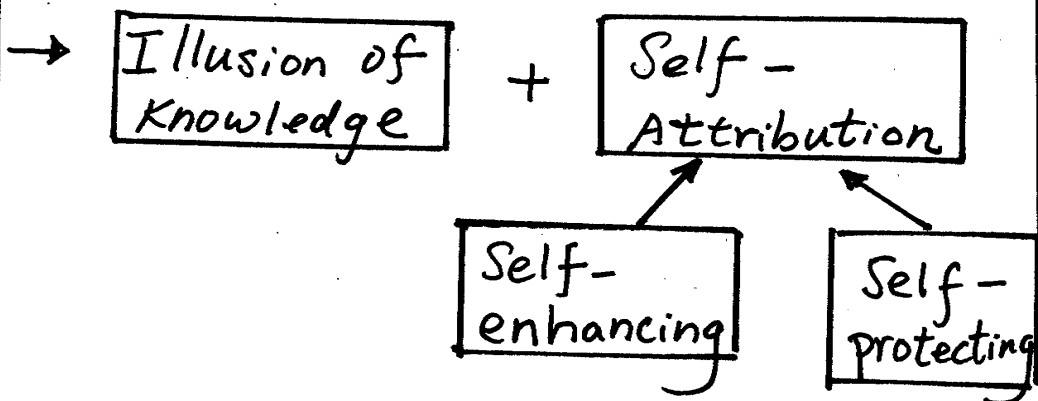
- ① Focus on "Return/Risk" rather than "gain/Loss".
- ② Follow your IPS; Disciplined approach based on fundamentals.
- ③ Make investment decision based on Expectations rather than past performance and recent volatility.

Overconfidence Bias

* Emotional Bias

* Definition:

→ Investors feel they know more than they actually do. They feel they have more or better information or better knowledge or ability for interpreting information.



Self-enhancing = claim too much credit for success

Self-protecting = place failure blame to other people or other things.

Q Suppose you have made "consistently" more than 10% return per month for the last three months (where the monthly market return was only 1% on average), what would you tell the "story" to your friends?

* Consequences:

→ Prediction Overconfidence

- ① Too narrow confidence intervals
- ② Underestimate downside risk but overestimate upside returns.
- ③ Ignore New information and maintain their original forecast.
- ④ poorly diversified portfolio.

→ Certainty Overconfidence

- ① Fail to include risk factors such as "shift of Yield Curve" or "change of spread" to investment analysis.
- ② Excessive trading.

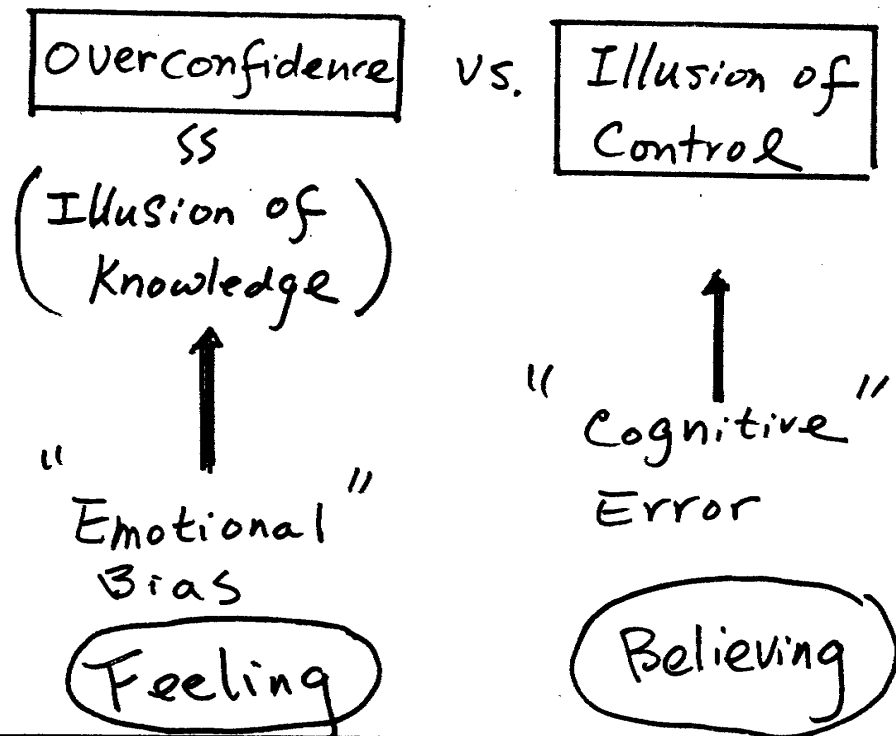
Overconfidence Bias

* How to overcome?

- ① Keep trading records and analyze investment performance related to "Luck" or "strategies"?
- ② Be objective and increase the range of forecast.

* Overconfidence Trap of Analyst

- ↑ Overconfidence about the accuracy of analysts' forecast.
- ① Ignore past mistake of forecast.
 - ② Too narrow range of forecast.
 - ③ Self-protection of forecast results
 - ④ Self-enhancing about forecast results.



Self-Control Bias

Page
18

* Emotional Bias

* Definition:

→ Investors suboptimal Saving-Consumption Patterns due to lack of discipline.

→ Fail to focus on Long-term Goal but look for short-term satisfaction.

→ Hyperbolic discounting

↑ prefer small payoff now compared to large payoffs in the future

Q. If you have extra disposable income, do you like to save that or spend it?

* Consequences:

- ① May take too much risk to make up shortfall of saving.
- ② Imbalance of Asset Allocation
- ③ Restrict portfolio's growth potential.
- ④ May lead to over-consume.

* How to overcome?

- ① Need to have a complete and suitable IPS subject to objectiveness and constraints.
- ② Develop "budgets" to reduce the propensity to over consume.

Emotional Bias

* Definition of Status Quo Bias

→ Investors feel more comfortable to stay in their current allocation of investment rather than make changes.

* Definition of Endowment Bias

→ Investors feel it is more valuable if they hold right to or own it.

* Definition of Regret-Aversion Bias

→ Investors don't like to take pain of regret from a bad decision making.

Error of Commission

Error of taking an action

Error of Omission

Error of NOT take an action.

Note: Regret-Aversion can initiate "Herding" behavioral Bias.
 ↑ "Follow to crowd"

* Consequences:

- ① Lead to Do-nothing strategy in investment allocation.
- ② Fail to explore other investment opportunities.
- ③ Place too high value for assets investor owns. → may bear high risk!
- ④ Hesitate to sell inherited [↑] assets.
- ⑤ Stay in low risk investment; limit upside potential.
- ⑥ Fail to meet Long-term goals.
- ⑦ Concentrated portfolios.

How to overcome?

- ① Education about risk, return & diversification.
- ② Develop a suitable IPS and replace familiar assets gradually to avoid discomfort.
- ③ Research familiar as well as unfamiliar assets that the investor may not hold.
- ④ Efficient frontier research and proper asset allocation.

Nevertheless; these biases are very difficult to be mitigated.

* Status Quo Trap of Analyst

↑ Don't want to deviate too far from recent past!

e.g. Current sale will be low because the sales over the past several years were weak.

* Prudence Trap of Analyst

↑ Avoid "regret" from making extreme forecast.

↑ make the range of forecast too wide

↑ may result a "herding" behavior.