

READING 9: BEHAVIORAL FINANCE AND INVESTMENT PROCESSES

Introduction

This reading focuses on understanding individual investor behavior and how it affects adviser–client relationships and portfolio construction, as well as on the analyst-committee, and market-level impact of behavioral biases.

A- The Uses and Limitations of Classifying Investors into Types

1- General Discussion of Investor Types

Psychographic classifications are particularly relevant with regard to individual strategy and risk tolerance. An investor’s background, past experiences, and attitudes can play a significant role in decisions made during the asset allocation process. **If investors fitting specific psychographic profiles are more likely to exhibit specific investor biases, then practitioners can attempt to recognize the relevant behavioral tendencies before investment decisions are made.**

a. Barnewall Two-Way Model

The Barnewall Two-Way Model **distinguishes two relatively simple investor types: passive and active; “passive investors” are defined as those investors who have become wealthy passively.** Passive investors have a greater need for security than they have tolerance for risk. Further, the smaller the economic resources an investor has, the more likely the person is to be a passive investor. The lack of resources gives individuals a higher security need and a lower tolerance for risk.

“Active investors” are individuals who have been actively involved in wealth creation through investment, and they have risked their own capital in achieving their wealth objectives. Active investors have a higher tolerance for risk than they have need for security. Related to their high risk tolerance is the fact that active investors prefer to maintain control of their own investments. Their tolerance for risk is high because they believe in themselves.

b. Bailard, Biehl, and Kaiser Five-Way Model

The Bailard, Biehl, and Kaiser (BB&K) model features some of the principles of the Barnewall model, but by classifying investor personalities along two axes—**level of confidence** and **method of action**—it introduces an additional dimension of analysis.

The first (aspect of personality) deals with how confidently the investor approaches life, regardless of whether it is his approach to his career, his health, or his money. These are important emotional choices, and they are dictated by how confident the investor is about some things or how much he tends to worry about them.

The second element deals with whether the investor is methodical, careful, and analytical in his approach to life or whether he is emotional, intuitive, and impetuous.

These two elements can be thought of as two “axes” of individual psychology; one axis is called the “confident–anxious” axis and the other is called the “careful–impetuous” axis.

Exhibit 1 **Bailard, Biehl, and Kaiser Model**



The Adventurer: Adventurers may hold highly undiversified portfolios because they are confident and willing to take chances. Their confidence leads them to make their own decisions and makes them reluctant to take advice. This presents a challenge for an investment adviser.

The Celebrity: Celebrities like to be the center of attention. They may hold opinions about some things but to a certain extent recognize their limitations and may be willing to seek and take advice about investing.

The Individualist: Individualists are independent and confident, which may be reflected in their choice of employment. They like to make their own decisions but only after careful analysis. They are pleasant to advise because they will listen and process information rationally.

The Guardian: Guardians are cautious and concerned about the future. As people age and approach retirement, they may become guardians. They are concerned about protecting their assets and may seek advice from those they perceive as being more knowledgeable than themselves.

The Straight Arrow: Straight arrows are sensible and secure. They fall near the center of the graph. They are willing to take on some risk in the expectation of earning a commensurate return.

Although this model may be useful, it is possible **that investors do not approach all parts of their life with equal confidence or care. It is important to focus on the approach to investing** rather than placing undue focus on evidence from other aspects of their life. In addition, a **limitation of all categorization schemes** is that an individual’s **behavior patterns may change or lack consistency.**

c. New Developments in Psychographic Modeling: Behavioral Investor Types

The BA approach is essentially a **shortcut that may more efficiently identify biases for the purpose of determining which type of bias dominates**. Using the BA approach, advisers and investors can test for the behavioral biases they are likely to encounter based on the psychological profile of clients and consider how to correct for or adapt to the biases.

i. *The Behavioral Alpha Process: A Top-Down Approach*

Step1: Interview the client and identify active or passive traits and risk tolerance.

Step2: Plot the investor on the active/passive and risk tolerance scale.

Step3: Test for behavioral biases.

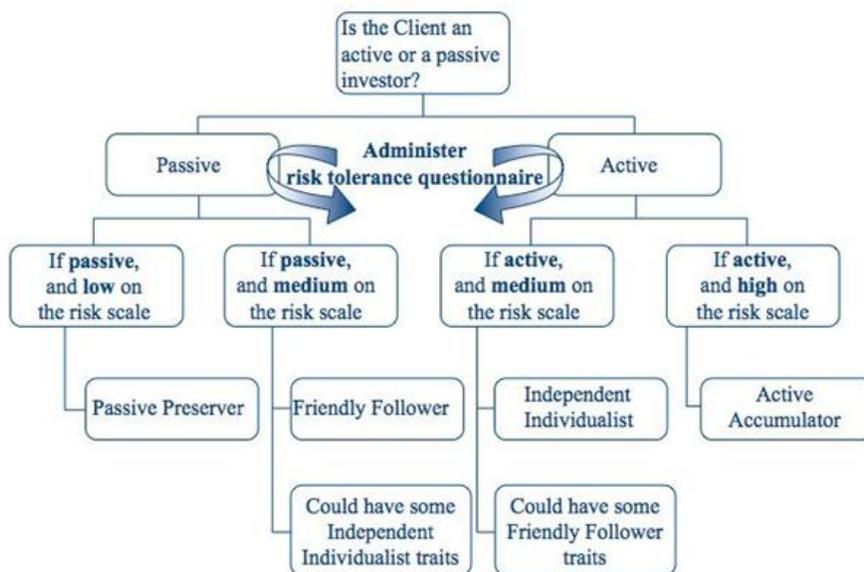
Step 4: Classify investor into a behavioral investor type.

Exhibit 4 Biases Associated with Each Behavioral Investor Type

General Type	PASSIVE		ACTIVE	
Risk Tolerance	Low ←—————→ High			
Investment Style	Conservative	Moderate	Growth	Aggressive
Bias Types	Primarily emotional	Primarily cognitive	Primarily cognitive	Primarily emotional
BITs	Passive Preserver (PP)	Friendly Follower (FF)	Independent Individualist (II)	Active Accumulator (AA)
Biases	Emotional		Cognitive	
Emotional	Endowment Loss aversion Staus quo Regret aversion	Regret aversion	Overconfidence and self-attribution	Overconfidence Self-control
Cognitive	Mental accounting Anchoring and adjustment	Availability Hindsight Framing	Conservatism Availability Confirmation Representativeness	Illusion of control

One of the key observations from Exhibit 4 is that at **either end of the passive/active scale are clients who are susceptible to emotional biases and in the middle are clients affected mainly by cognitive biases or errors**.

Exhibit 5 The Behavioral Investor Type Diagnostic Process



- Advising Passive Preservers:** PPs are more receptive to “big picture” advice that does not dwell on such details as standard deviations and Sharpe ratios. Because PPs are emotionally biased, providing excessive cognitive detail will lose their attention. **Advisers should focus on what the money will accomplish, such as family legacy goals, education, and so on.** PPs need to be persuaded about the **soundness of their adviser’s general philosophy first, and then, as trust is gained, PPs will respond to advice and take action.** The emotional **biases most common to PPs** are **endowment, loss aversion, status quo, and regret aversion.**
- Advising Friendly Followers:** Advisers need to guide them to take a hard look at behavioral tendencies that contribute to overestimating risk tolerance. Because FF biases are mainly cognitive, **education on the benefits of portfolio diversification is usually the best course of action.** Advisers should **challenge FF clients to be introspective and provide data-backed support for recommendations.** **Offering education in clear, unambiguous ways is helpful so that FFs have the opportunity to understand the implications of investment choices.** If advisers take the time, **this steady, educational approach** will generate greater client loyalty and adherence to long-term investment plans from Friendly Followers. **Biases of FFs tend to be cognitive.** Their decisions typically are influenced by **availability, hindsight, and framing biases.** **Regret aversion,** as it relates to herding behavior, is an emotional bias with a significant impact.

- **Advising Independent Individualists:** Independent Individualists may be difficult clients to advise because of their independent mindset, but they are usually **willing to listen to sound advice when it is presented in a way that respects their intelligence**. IIs have faith in themselves and their decisions, but may be unaware of their tendency to take a contrarian position. **As with Friendly Followers, education is essential to changing their behavior because their biases are predominantly cognitive**. A good approach is to have **regular educational discussions during client meetings**. II biases are typically cognitive. **Conservatism, availability, confirmation, and representativeness** biases are common to IIs. **Overconfidence** and **self-attribution** biases are the emotional biases that IIs sometimes exhibit.
- **Advising Active Accumulators:** The Active Accumulator is the **most aggressive behavioral investor type**. These clients are entrepreneurial and often the first generation to create wealth; and they are even more strong-willed and confident than Independent Individualists. The best approach to dealing with these clients is to **take control of the situation**. If advisers let the AA client dictate the terms of the advisory engagement, the client's emotionally oriented decision making will dominate and the result will likely be an unhappy client and an unhappy adviser. **Advisers need to prove to the client that they have the ability to make wise, objective, and long-term decisions and can communicate these results in an effective way**. Advisers who take control are more likely to have Active Accumulator clients listen to and accept their advice. **AA biases are typically overconfidence, self-control, and illusion of control**. As a result of these biases, they may be overly optimistic about their investment choices.

2- *Limitations of Classifying Investors into Various Types*

The limitations of behavioral models include the following:

- 1) Individuals may exhibit **both cognitive errors and emotional biases**. It may not be appropriate in most cases to classify a person as either an emotionally biased person or a cognitively biased person.
- 2) Individuals may exhibit **characteristics of multiple investor types**.
- 3) Individuals will likely go through **behavioral changes as they age**.
- 4) Individuals are likely to **require unique treatment** even if they are classified as the same investor type because human behavior is so complex.
- 5) Individuals **act irrationally at different times and without predictability**.

B- *How Behavioral Factors Affect Adviser/Client Relations*

Wealth management practitioners have different ways of measuring the success of an advisory relationship, but few would dispute that **every successful relationship shares a few fundamental characteristics**, including the following as outlined by Pompian (2006):

- 1) The **adviser understands the client's financial goals and characteristics**.
- 2) The adviser maintains a **systematic (consistent) approach** to advising the client.

- 3) The **adviser invests as the client expects**. Results are communicated on a regular basis and in an effective manner that takes into account the client's characteristics.
- 4) The relationship **benefits both client and adviser**.

a. **Formulating Financial Goals**

To best define financial goals, it is helpful to understand the psychology and emotions involved in the decisions underlying the goals. Behavioral finance helps advisers discern why investors set the goals they do.

b. **Maintaining a Consistent Approach**

Incorporating behavioral finance can become part of that discipline without requiring large-scale changes in the adviser's methods. Behavioral finance can also add professionalism and structure to the relationship, allowing advisers to better understand the client before delivering any investment advice.

c. **Investing as the Client Expects**

Perhaps no other aspect of the advisory relationship could benefit more from behavioral finance. Behavioral finance provides a context in which the adviser can "take a step back" and attempt to explore the motivations of the client. With a more thorough understanding of the client's expectations, the adviser is better equipped to help satisfy them.

d. **Ensuring Mutual Benefits**

The primary benefit that behavioral finance offers is the ability to develop a stronger bond between clients and advisers. By "getting inside the head" of the client and developing a comprehensive grasp of his motives and fears, the adviser can help the client better understand why a portfolio is designed the way it is and why it is an appropriate portfolio for him or her, regardless of what happens day-to-day in the markets.

e. **Limitations of Traditional Risk Tolerance Questionnaires**

- Risk tolerance questionnaires can generate **dramatically different results** when administered repeatedly to the same individual, but with slight variations.
- Additionally, many **risk tolerance questionnaires are administered once**, and may not be revisited.
- Risk tolerance **can vary as a result of changing life stages** or events so it is critical to re-evaluate it periodically. Another critical drawback of risk tolerance questionnaires is that many advisers interpret their results too literally.

Risk tolerance questionnaires **provide only broad guidelines for asset allocation**, and should be used in concert with other behavioral assessment tools. From the behavioral finance perspective, risk tolerance questionnaires may work better **as a diagnostic tool for institutional investors** compared with individual

investors. This difference is because **institutional investors are familiar with mean–variance optimization and think about risk. For them, risk analysis is a cognitive process.**

Behavioral biases should be identified before the allocation is executed, so that problems such as moving repeatedly in and out of an allocation can be avoided. By doing so, the IPS that includes behavioral factors may result in decisions that the investor can adhere to. **The IPS can be re-evaluated on a regular basis and updated for changes in the investor’s circumstances and risk tolerance.**

C- How Behavioral Factors Affect Portfolio Construction

Behavioral biases may affect how investors construct portfolios from the securities available to them. One way to consider this issue is to analyze the actual portfolios investors construct and compare them with the portfolios implied by traditional portfolio theory. **Some useful evidence on the portfolio selection decisions of individual investors comes from defined-contribution (DC) pension plans.**

1- Inertia and Default

Consistent with the status quo bias, a key finding is that **most DC plan members show inertia and tend not to change their asset allocations through time, even though it might be assumed that their tolerance for risk and other circumstances would be changing.**

There is also substantial evidence that shows **inertia leads plan participants to stick with default options in terms of contribution rates and investment funds.** In many cases, the default funds will be cash or money market funds, which are arguably too conservative for long-term savings, with low risk but also low rates of return

2- Naïve Diversification

There is evidence of **investors using simple heuristics to allocate among available funds and of framing bias.** *Regret may play a role in explaining naïve diversification strategies. Benartzi and Thaler (2007) cite an interview with Harry Markowitz in which he notes that he selected a 50/50 allocation between stocks and bonds in his TIAA-CREF retirement account. He states that his intention was to minimize future regret from one asset class beating the other, an essentially behavioral explanation, and perhaps an emotional one.!!!!*

3- Company Stock: Investing in the Familiar

A very graphic example of potentially inappropriate portfolio construction approaches in DC plans comes in the form of **high levels of investment in the stock of the sponsoring company.**

Explanations given for investment in employer's stock include the following

- **Familiarity and overconfidence** effects
- **Naïve extrapolation of past returns**
- **Loyalty** effects
- **Financial incentives**

4- Excessive Trading

The evidence of member inertia in DC plans is in contrast to evidence of individuals with retail investment accounts. **Investors with retail accounts appear to be more active traders. Investors trade too much—damaging returns—and tend to sell winners and hold on to losers—the disposition effect.** Excessive trading appears to be driven by overconfidence

5- Home Bias

Portfolio diversification represents another dimension in which investors must make a choice. Members can diversify internationally as well as across asset classes. A large body of literature exists showing that **many investors maintain a high proportion—often 80 percent or more—of their investments in securities listed in their own country**

6- Behavioral Portfolio Theory

Portfolios affected by behavioral biases, are formed as layered pyramids in which each layer is aligned with an objective. As a result of a **mental accounting bias** in which people treat one sum of money differently from another sum based on which mental account the money is assigned to, **investments are allocated to discrete layers without regard for the correlations among these investments.**

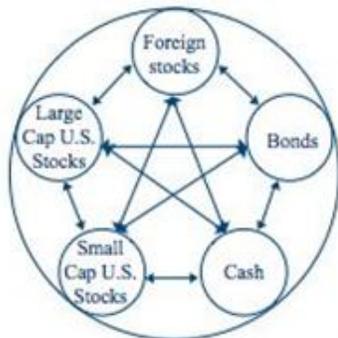
An important point to note is that investors do not have a single attitude toward risk. **They have multiple attitudes toward risk depending on which part of their wealth is being considered.** Hence, in a behavioral context it **might make sense for investors to say they are prepared to take a lot of risk with some of their money, even though such a statement makes little sense in a conventional mean–variance portfolio theory framework.**

Exhibit 6

Structures of Mean-Variance and Behavioral Portfolios

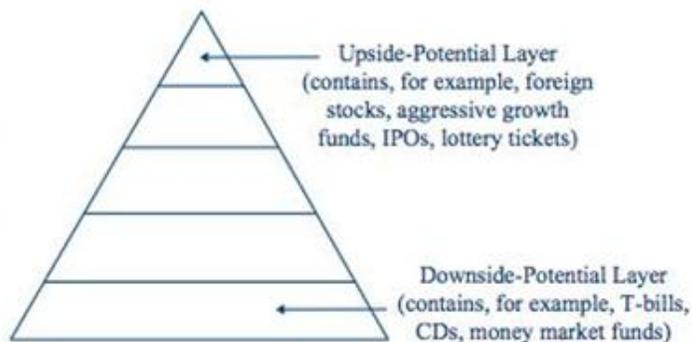
Mean-Variance Portfolio

Mean-variance portfolios are constructed as a whole, and only the expected return and the variance of the entire portfolio matter. Covariance between assets is crucial in determination of the variance of the portfolio.



Behavioral Portfolio

Behavioral portfolios are constructed not as a whole but layer by layer, where each layer is associated with a goal and is filled with securities that correspond to that goal. Covariance between assets is overlooked.



Source: Statman (1999).

D- Behavioral Finance and Analyst Forecasts

The work of analysts, which includes research, judgment, forecasts, decisions, and conclusions, may be affected by behavioral biases and cognitive dissonance. In other words, analysts are not immune to behavioral biases and exhibiting irrational behavior.

1- Overconfidence in Forecasting Skills

Overconfidence is a key behavioral bias relevant to investment analysts. Overconfidence bias is a bias in which people demonstrate unwarranted faith in their own intuitive reasoning, judgments, and/or cognitive abilities. This overconfidence may be the result of overestimating knowledge levels, abilities, and access to information. **Overconfidence has been shown to be particularly evident for strategists, rather than for individual stock or industry analysts. Stock analysts are typically more confident about earnings forecasts than target prices.**

A key bias linked to overconfidence is the illusion of knowledge. **Analysts believe that by acquiring information, they can know more than others and obtain an edge.** In other words, information will result in analysts being more knowledgeable and thus more accurate in their forecasts compared with others. As a result, **they may collect too much information. Although forecasting is driven by information, additional data that is not adding material content tends not to increase the accuracy of a forecast, but instead reinforces an analyst's confidence in that forecast.**

Attempting to collect more than needed extra information can lead to:

- **Representativeness bias**
- **Availability bias**
- **Illusion of control**

Other biases analysts and experts are prone to are:

- **Self-attribution bias, which contributes to overconfidence**
- **Hindsight bias**

a. **Remedial Actions for Overconfidence and Related Biases**

Remedial actions include:

- 1) Giving **prompt, well-structured, and accurate feedback**/can also reduce hindsight bias
- 2) Developing **explicit and unambiguous conclusions**/can also reduce hindsight bias
- 3) Having a systematic **review process** and a structure that **rewards accuracy**
- 4) Conducting **regular appraisals by colleagues and superiors**
- 5) Providing **counterarguments**; and **documenting comparable data**

Ideally, analysts should incorporate additional information with a Bayesian approach to calculate probabilities, recognize underlying base rates, and link probabilities conditionally.

2- Influence of Company's Management on Analysis

Company management is also susceptible to behavioral biases. Framing, anchoring and adjustment, and availability are important cognitive biases in this context.

For example, a management presentation describing specific successes or **selecting favorable comparisons for business performance** could anchor an analyst's view of the business results as successful. Subsequent **less favorable metrics or explanations might not be given the appropriate consideration or weight.**

Analysts should also recognize the possibility of a **self-attribution** bias in company executives that arises from the impact of incentive compensation on company reporting. **Incentive compensation for both company management and for analysts can be too large, creating errors of reasoning and judgment because of preoccupation with specific factors.**

Framing and setting expectations may be influenced by companies presenting recalculated earnings. This recalculation may happen if management believes earnings are temporarily or artificially depressed; typically, the recalculation does not comply with generally agreed accounting practice presentation. Usually, the recalculated earnings are more favorable and given greater prominence in company reporting.

a. Remedial Actions for Influence of Company's Management on Analysis

Analysts can best deal with cognitive biases in the interpretation of information by:

- Maintaining a **disciplined and systematic approach**
- Focusing **on metrics and comparable data**, rather than what is descriptive or unverifiable
- **Framing the issue appropriately**
- **Gathering information**
- Recognizing **underlying base rates**

3- Analyst Biases in Conducting Research

- Although cognitive biases may be the most significant behavioral problem for analysts, there is usually also an emotional component to judgment. **Specific biases** can be more prevalent in company analysis. Collecting too much unstructured information may not only lead to **illusions of knowledge and control**, contributing to **overconfidence**, but can also expose analysts to the risk of **representativeness**. Additional information can feed representativeness. *An indicator that a conclusion has been driven by extraneous detail may be that the conclusion is presented as a story.*
- **Confirmation bias**, a cognitive bias, is the tendency for people to misread evidence as additional support for an initial hypothesis. Confirmation bias is a form of resolving cognitive dissonance that describes the tendency to search for, or interpret, information in a way that confirms the analyst's prior beliefs
- With the **gamblers' fallacy**, the analyst is expecting a pattern that has diverged from the long-term average to reverse within a specific period of time. Another fallacy, common to gamblers and many others, is the **hot hand fallacy**. People affected by this fallacy wrongly project continuation of a recent trend. Both of these fallacies demonstrate a lack of understanding of statistical independence.
- Similar to **endowment bias**, assets may be endowed with additional value based on an emotional response to them. Analysts can associate financially sound companies with good or safe characteristics, although the external economic environment or high stock price for the company can make it risky.

a. Remedial Actions for Analyst Biases in Conducting Research:

- **Using consistent data**
- **Evaluating previous forecasts**
- **Taking a systematic and structured approach**
- **Assigning probabilities**
- **Seeking contrary facts and opinions**
- **Incorporating evidence sequentially**
- **Having prompt feedback**
- **Documenting the process**

E- How Behavioral Factors Affect Committee Decision Making

Many investment decisions are made by groups or committees rather than by individuals acting alone. The group process may mitigate a bias or it may exacerbate it. We also need to consider whether the group decision-making process creates additional biases.

Social proof is a bias in which individuals are biased to follow the beliefs of a group. Analysts may wrongly favor the judgment or endorsement of others, often without being fully aware that they are doing so. This behavior can adversely affect analytical work.

The process of reaching a consensus will usually narrow the range of views. If a group-decision process does not encourage private information held by individual analysts to be shared fully with others before a decision is made, the decision may fail to combine the collective wisdom of the group. Group judgments are potentially better than individual ones, but biases mean that **the group may not perform optimally**. Typically, a group will have more confidence in its decisions after discussion that leads to an **overconfidence bias**.

1- Investment Committee Dynamics

All of the biases present in individuals can be present in investment committee decisions. A group environment may increase them. For example: any disagreement with people in power is reflected by the Japanese proverb, “the nail that sticks up gets hammered down.” Prior experience with group behavior teaches **most members to preserve consensus or face the consequences**.

In general, decision makers are most likely to learn to control harmful behavioral biases in situations where the **decision makers have repeated attempts at the decision and there is good quality feedback on prior outcomes**. It follows that investment committee decision making should be improved by carefully analyzing and learning from past decisions. Wood (2006) argues that this rarely happens, and **changing committee membership is particularly unhelpful in this regard**.

2- Techniques for Structuring and Operating Committees to Address Behavioral Factors

- Teams that are **diverse in skills, experience, and culture** may be **less prone to social proof bias**. Different perspectives and contrary views are more likely to emerge in a diverse group.
- Ensuring **professional respect** between all members of the group and **maintaining analysts’ self-esteem** can help each member contribute to group judgment, even if the views expressed are contrary to group norms.
- An individual expressing **strong contrarian views** within the group can help in avoiding too quick of a move to consensus before all the evidence is discussed.
- The **risk of suppressed privately held information** by individuals can be reduced if a group leader collects some of the individual **views in advance of a discussion**.

F- How Behavioral Finance Influences Market Behavior

Behavioral finance does offer some explanation of these exceptions to market efficiency, and this reading focuses on the biases that contribute to these anomalies. Investment professionals should view an understanding of these biases as complementary to their knowledge of market efficiency, thus allowing a greater range of stock market and investor behavior to be explained.

1- Defining Market Anomalies

Anomalies: apparent deviations from the efficient market hypothesis—are identified by **persistent abnormal returns** that differ from zero and are **predictable in direction**.

However, calculating what constitutes normal returns **relative to the risk incurred** depends on the asset **pricing model used**. Anomalous behavior can be indicative of shortcomings in the underlying asset pricing model.

Also, from time to time, markets can present **temporary disequilibrium behavior**, unusual features that may survive for a period of years but ultimately disappear. Publication of the anomaly, which draws attention to the pattern, can start the arbitrage that removes the behavior.

Some of these market features may be attributed to **rational behavior that is not captured by accepted pricing models**. **Investor response to the effect of taxes** might be an example of this issue. But for other patterns of questionable rationality, behavioral finance has provided good explanations by identifying persistent cognitive biases or emotional effect.

Despite the challenges, the efficient market hypothesis provides a base from which anomalies can be identified, and against which specific cognitive biases can be measured.

2- Momentum

Studies have documented, in a range of markets globally, **momentum or trending effects** in which **future price behavior correlates with that of the recent past**.

The phenomenon is **more common in illiquid asset** categories in which trading may not be continuous and investors believe that changes in prices may capture private information.

Herding occurs when a group of investors trade on the same side of the market in the same securities, or when investors ignore their own private information and act as other investors do. Herding may be a response to cognitive dissonance. It may give reassurance and comfort to investors to be aligned with the consensus opinion.

Momentum can partly be explained by:

- Anchoring bias
- Availability bias/ recency effect or bias
- Regret as an expression of hindsight which also leads to trend-chasing effect/investors buy securities they wish they had owned last year.

The **slow price adjustment** of the securities to momentum is due to the **disposition effect**. However, there is some evidence of price reversals, or a mean reversion, at longer periods of three to five years. The **disposition effect, which includes an emotional bias to loss aversion**, will encourage investors to hold on to losers, causing an inefficient and gradual adjustment to deterioration in fundamental value

3- Bubbles and Crashes

Stock market bubbles and crashes present a challenge to the concept of market efficiency. Periods of significant overvaluation or undervaluation can persist for more than one year, rather than rapidly correcting to fair value. The efficient market hypothesis implies the absence of such bubbles.

A more objective modern definition specifies periods when a price index for an asset class trades more than two standard deviations outside its historic trend. Statistically, if returns are normally distributed, such periods should not represent more than 5 percent of total observations. However, for some stock markets and asset classes, these extremes of valuation account for more than 10 percent.

Behavioral finance does not yet provide a full explanation for such market behavior, but a number of specific cognitive biases and emotional biases prevalent during such periods can be identified.

First, it should be noted that there can also be rational explanations for some bubbles. **Rational investors may expect a future crash but not know its exact timing. For periods of time, there may not be effective arbitrage because of the cost of selling short, unwillingness of investors to bear extended losses, or simply unavailability of suitable instruments.**

In bubbles, investors often exhibit symptoms of:

- overconfidence
- overtrading
- underestimation of risks
- failure to diversify
- rejection of contradictory information

The overconfidence and excessive trading that contribute to a bubble are linked to **confirmation bias** and **self-attribution bias**. The **disposition effect** recognizes that investors are more willing to sell winners, which can encourage excess trading.

Regret aversion can also encourage investors to participate in a bubble, believing they are “missing out” on profit opportunities as stocks continue to appreciate.

In crashes, the **disposition effect** encourages investors to hold on to losers and postpone regret. This response can initially cause an underreaction to bad news, but a later capitulation and acceleration of share price decline. This situation will only apply to stocks already held by investors, with hedge funds that can sell stock short being more inclined to react first to bad news in a downturn. In crashes, there may be belief that short sellers know more and have superior information or analysis.

4- Value and Growth

A number of studies have identified **outperformance of value stocks relative to growth stocks over long periods of time.**

- Fama and French incorporate **additional factors in their asset pricing model to explain this anomaly** and other apparent anomalies. The Fama and French (1992) three-factor model claims to explain these effects by incorporating additional factors, size and value, alongside market beta. Fama and French claim the value stock anomaly disappears in their three-factor model. **They believe that the size and book-to-market effects are not mispricing, but are associated with such risk exposures as the greater potential of companies with these characteristics to suffer distress during economic downturns.**
- A number of other studies have offered behavioral explanations, presenting the anomalies as mispricing rather than risk. These studies recognize **emotional factors involved in appraising stocks.** The **halo effect**, for example, extends a **favorable evaluation** of some characteristics to other characteristics. A company with a good growth record and good previous share price performance might be seen as a good investment, with higher expected returns than its risk characteristics merit. This view is a **form of representativeness** that can lead investors to **extrapolate recent past performance** into expected returns. **Overconfidence** can also be involved in predicting growth rates, potentially leading growth stocks to be overvalued.

The emotional attraction of a stock can be enhanced by personal experience of products, the value of the brand, marketing expenditures, and the proximity of the headquarters to the analyst or investor. This last issue reflects the home bias anomaly, by which portfolios exhibit a strong bias in favor of domestic securities in the context of global portfolios.

The **most persistent market anomalies** and characteristics that challenge the efficient market hypothesis are the momentum effect and **bubbles** and **crashes.** These effects can be created by biases that cause underreactions at times but overreaction on other occasions. Although group behavior can be a factor in these market anomalies, the **origins of many anomalies lie in individual biases.** The biases that create some of the unusual market behavior include both cognitive biases and emotional effects.