Agent-Based Models of financial markets
The agents’ behaviors

“Managing behavior to make better investment decisions”

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I. BEHAVIORAL FINANCE

In *The wealth of Nations* (1776), Adam Smith famously argued that economic behavior was motivated by self-interest.

Earlier in 1759 Smith had proposed a *Theory of human behavior* that looks anything but self interested.

The *theory of Moral Sentiments* (1759), Smith argued that humans have a natural tendency to care about the well-being of others for no other reason than the pleasure one gets from seeing them happy. He calls this sympathy the passion.
The **overreaction in markets** was made by J. M. Keynes (1936): "...day-to-day fluctuations in the profits of existing investments, which are obviously of an ephemeral and nonsignificant character, tend to have an altogether excessive, and even an absurd, influence on the market" (1964, pp. 153-1541)

Their study interested to both market behavior and the psychology of individual decision making.

➢ Both classes of behavior can be characterized as displaying overreaction.

Explanations: (1) alleged misspecification of the capital asset pricing model (CAPM); (2) Companies with very low price earnings ratio are thought to be temporarily "undervalued" because investors become excessively pessimistic after a series of bad earnings reports or other bad news (Peso phenomenon).

DeBondt and Thaler (1995) confirm that a good psychological finance theory will be grounded on psychological evidence about how people actually behave.
• **Shiller (2003)** mentions “The collaboration between finance and other social sciences that has become known as behavioral finance has led to a profound deepening of our knowledge of financial markets”.

• “Behavioral finance is the study of the influence of psychology on the behavior of financial practitioners and the subsequent effect on markets” **Sewell (2005).**
ASSUMPTIONS

- Asymmetric information in financial markets;
- The market’s tendency to over- or underreact to different types of information.

- Financial markets are not efficient

- The tendency for individuals to mimic the actions of a larger group: herd behavior
- Investors are over-confident
- Investors make complex selections with rules and shortcuts called heuristics.

- Agents (markets actors) are not rational
• **Daniel Kahneman** is an Israeli-American psychologist.

• He shared the **2002 Nobel Prize** in Economic Sciences with Vernon L. Smith.

• Kahneman is notable for his work on the psychology of judgment, decision-making, and **behavioral economics**.
The book's central thesis is a dichotomy between two modes of thought: "System 1" is fast, instinctive and emotional; "System 2" is slower, more deliberative, and more logical.

1. **System 1** includes innate skills that we were born with and other activities that have become automatic through prolonged practice (quick reaction).

2. **System 2** operations require attention and are disrupted when attention is drawn away. System 2 activities require effort. It’s guided by the intuitions and impulses of System 1 (slow reaction).

The two systems interact with each other. When system 1 encounters difficulty, it calls on System 2 for more details to solve the problem.
II. HOW TO EXPLAIN JUDGMENT AND DECISION BIASES?


Argues that heuristic simplification, self-deception, and emotional loss of control provide an explanation for most known judgment and decision biases.
One reason people are influenced by the format of decision problems is that they cannot perfectly retrieve relevant information from memory (Tversky and Kahneman, 1973) and Pennington and Hastie, 1988).
Home bias refers to the tendency to overweight domestic equities and underweight international equities in investment portfolios (French and Poterba, 1991).

The tendency for investors to invest in a large amount of domestic equities.

The home bias problem: too little is invested outside of the home market.

Hypothesis contends that home investors have superior access to information about domestic firms or economic conditions.
Anchoring

• Tversky and Kahneman (1974): It is the phenomenon that people tend to be unduly influenced in their assessment of some quantity by arbitrary quantities mentioned in the statement of the problem, even when the quantities are clearly uninformative.

• Anchoring (focalism) is a cognitive bias observed when people must make choices under uncertainty, and is particularly evident when the result of the choice can be expressed as a number in a range.

• Investors adjust their decisions up or down according to intuition or experience to reach the final result. The adjustment applied to the initial anchor is frequently insufficient to compensate for the negative effects of the anchor.
Self-perception theory

According to self-perception theory (Bem, 1972, p. 2)

“Individuals come to know their own attitudes, emotions and internal states by inferring them from observations of their own behavior and circumstances in which they occur.”

The need to infer can result from memory loss or from simple lack of access to unconscious internal states.

- The theory that states people only have a **limited access** to the **attitudes, beliefs, traits** or **their psychological states**. They must use **inference cues** to find out more about **themselves**.

- A tendency to form habits can be an optimal mechanism to address memory loss, reflecting an implicit self-perception that actions taken before probably had a good reason. Habits, including the habitual adherence to self-imposed rules can also play a role in self-regulation strategies (Thaler and Shefrin, 1981) and Shefrin and Statman, 1984).
Narrow framing

• An investor suffers from narrow framing when he seems to make investment decisions without considering the context of his total portfolio.

• It involves analyzing problems in too isolated a fashion. This makes excellent sense when time and cognitive resources are limited. An implication is that the form of presentation of logically identical decision problems, such as the highlighting of a different reference for comparison of outcomes can have large framing effects on choices (Tversky and Kahneman, 1981, 1986).

• Answer a question differently based on the way in which it is asked (framed).
The disposition effect is that investors are predisposed to holding losers too long and selling winners too early’ (Shefrin, 2000).

The 'disposition effect' is the tendency to sell assets that have gained value ('winners') and keep assets that have lost value ('losers').

Disposition effects can be explained by the two features of prospect theory: the idea that people value gains and losses relative to a reference point (the initial purchase price of shares), and the tendency to seek risk when faced with possible losses, and avoid risk when a certain gain is possible.
Example:

One of the most robust facts describing individual trading behavior is the *disposition effect*: investors have a greater propensity to sell assets when they are at a gain than when they are at a loss (Shefrin and Statman (1985)).

- Chang et al. (2015) examine cognitive dissonance for understanding variation in the disposition effect both within and across asset classes.
Cognitive dissonance is defined as the discomfort that arises when a person recognizes that he or she makes choices and/or holds beliefs that are inconsistent with each other (Festinger (1957)).

This discomfort is particularly acute when one of the beliefs in question relates to the individual's self-concept (e.g., Gecas (1982)).

Investors feel a cognitive dissonance discomfort when faced with losses – there is a disconnect between the belief that the investor makes good decisions and the fact that the investor has now lost money on the position.
Data

The data come from a large discount brokerage and include 128,829 accounts with monthly position information, comprising 73,558 households from January 1991 to November 1996.

They examine the portfolio of gains and losses on all dates when an individual investor conducted a sale of any security in their account. In periods when there is no sale at all, it is difficult to tell if this is a deliberate choice by the investor or simple inattention.
Results

Results suggest that **cognitive dissonance** is an important driver of the disposition effect, and that the psychological effects of portfolio delegation help explain the apparently contradictory household behavior across different asset classes.
Investors avoid realizing losses because they dislike admitting that past purchases were mistakes, but delegation reverses this effect by allowing the investor to blame the manager instead.

Using individual trading data, they show that the disposition effect—the propensity to realize past gains more than past losses—applies only to nondelegated assets like individual stocks;

- They show increasing investors' cognitive dissonance results in both a larger disposition effect in stocks and a larger reverse-disposition effect in funds.
Mental accounting

• It is a kind of **narrow framing** that involves keeping track of gains and losses related to decisions in separate mental accounts, and to reexamine each account only intermittently when action relevant.

• Mental accounting may explain the disposition effect *(Shefrin and Statman, 1985)*, an excessive propensity to hold on to securities that have declined in value and to sell winners.

• Having observation of gains and losses trigger pleasant or unpleasant feelings seems a sensible mental design to motivate profitable actions.
Regret aversion

- Regret avoidance may also reflect a self-deception mechanism designed to protect self-esteem about decision-making ability (Josephs et al., 1996).

- Regret is stronger for decisions that involve action rather than passivity (Kahneman and Tversky, 1982).

- Regret aversion can explain the endowment effect, a preference for people to hold on to what they have rather than exchange for a better alternative, as with the refusal of individuals to swap a lottery ticket for an equivalent one plus cash.
Loss aversion

- Loss aversion is the phenomenon that people tend to be **averse** even to very small **risks** relative to a reference point, suggesting a kink in the utility function.

- This may result from the cognitive efficiency of mentally discretizing continuous variables, as reflected in the use of terms like “gain,” “break even,” and “loss,” which make the distinction between a gain and loss more salient.
Representativeness heuristic

• It involves assessing the probability of a state of the world based on the degree to which the evidence is perceived as similar to or typical of the state of the world.

• The representativeness heuristic is one type of heuristic that we use when making judgments. In this particular example, we estimate the likelihood of an event by comparing it to an existing prototype that already exists in our minds.

• Similarity can be viewed as an indicator of the conditional probability of the evidence given the state of the world versus other states.
Conservatism

• Edwards (1968) identified the phenomenon of conservatism, that under appropriate circumstances individuals do not change their beliefs as much as would a rational Bayesian in the face of new evidence.

• The more useful the evidence, the greater the shortfall between actual updating and rational updating.

• Conservatism implies underweighting of new evidence.

➢ One explanation for conservatism is that processing new information and updating beliefs is costly.
2) **SELF-DECEPTION**
Hindsight bias

• The **hindsight bias** refers to the tendency people have to view **events** as more **predictable** than they really are. After an event, people often believe that they *knew* the outcome of the event before it actually happened.

• It helps our self-esteem to think we “*knew it all along*”; and the phenomenon of rationalization - constructing a plausible ex post rationale for past choices helps an individual feel better about his decision competence.

• It occurs when an investor perceives **investment outcomes** as if they were **predictable**
According to attribution theory (Bem, 1965), individuals strongly attribute events that confirm the validity of their actions to high ability, and events that disconfirm the action to external noise or sabotage.

This relates to the notion of cognitive dissonance, in which individuals internally suppress information that conflicts with past choices.

Individuals overestimate their own abilities in various contexts.

People tend to attribute good outcomes to their own abilities and bad outcomes to external circumstances.

Self-attribution causes individuals to learn to be over-confident rather than converging to an accurate self-assessment.
Overconfidence

• According to DeBondt and Thaler (1995), overconfidence is perhaps the most robust finding in the psychology of judgement.

• People believe their knowledge is more accurate than it really is. For example, their predictions of probabilities of events are too extreme too high relative to the true frequency when they think the event probably will occur, too low when they think it will not.
• **Overconfidence** implies **overoptimism** about the individual’s ability to succeed in his endeavors. Such optimism has been found in a number of different settings (Miller and Ross, 1975). Men tend to be more overconfident than women.

• **Overconfidence**: the tendency of individuals to think that they are better than they really are in terms of characteristics such as ability, judgment, or prospects for successful life outcomes (Hirshleifer et al., 2012)

How managers’ psychological bias (overconfidence) affect firm decisions?

- **STEVE JOBS**, FORMER CEO of Apple Computers, was ranked by Business-Week as one of the greatest innovators of the last 75 years in a 2004 article - written before Apple’s introduction of the path-breaking iPhone and iPad.

- **JOBS** is almost as famous for his self-confidence.
• They find that over the 1993–2003 period, firms with overconfident CEOs have greater return volatility, invest more in innovation, obtain more patents and patent citations, and achieve greater innovative success for given research and development expenditures.

• However, overconfident managers achieve greater innovation only in innovative industries.

➢ Their findings suggest that overconfidence helps CEOs exploit innovative growth opportunities.

Overconfidence directly influences decision-making, it is logical to investigate the effects that overconfident managers have on corporate policies and firm value. How does overconfidence affect the investment decisions that managers make on behalf of shareholders? Do firms benefit from managerial overconfidence?
To do so, they develop a simple capital budgeting problem in which a manager, using his information about the prospects of a risky project, must decide whether his firm should undertake the project or drop it in favor of a safer investment alternative.

Their model shows that a manager’s overconfidence creates two potential sources of value for him and the firm.

1. **First,** the manager’s overconfidence commits him to follow an optimal risky investment policy with a flatter compensation schedule.

2. **Second,** the manager’s overconfidence commits him to exert effort to gather information that improves the success rate and value of the firm’s investment policy.
They conclude that **overconfident managers** are also **more attractive** to firms than their **rational counterparts** because **overconfidence commits** them to exert effort to learn about projects.

- But too much overconfidence is detrimental to the manager since it leads him to accept highly convex compensation contracts that expose him to excessive risk.
3) EMOTIONS AND SELF-CONTROL
Averse to ambiguity

• People are averse to ambiguity, causing irrational choices. Ambiguity aversion has been confirmed in market experimental settings. It seems to reflect a more general tendency for emotions such as fear to affect risky choices (Peters and Slovic, 1996).

• Ambiguity aversion refers to the fact that people tend to prefer risk (a gamble with known probabilities) to uncertainty (a gamble with unknown or ambiguous probabilities).

• A possible explanation for ambiguity aversion is that the obvious absence of an identifiable parameter of the decision problem may often be associated with higher risk and the possibility of hostile manipulation. This justifies a focus on missing information, but such a heuristic can go astray when there is no hostile manipulation.
Mood and emotions

- People who are in **good moods** are **more optimistic** in their choices and judgments than those in bad moods (Wright and Bower, 1992).

- **Bad moods** are associated with more **detailed and critical strategies** of evaluating information (Petty, Gleicher, and Baker, 1991).

- The influence of **mood and emotion** on **purchase plans** and the effects of advertising have been studied by marketing researchers as well.

- For example: people feel **happier on sunny days** than on **rainy days**, but priming them by asking them about the weather affects their judgment of how happy they are (Schwarz and Clore, 1983).
Self-Control

• "Self-control means controlling emotions. Some investors value dividends for self-control reasons as well as for reasons that stem from hedonic editing." Shefrin, (2000 p. 30).

• Tendency to behave **impatiently today** but plan to **act patiently in the future**. For instance, when offered a choice between 10 today and 11 tomorrow, many people choose the immediate option. However, if asked today to choose between 10 in a year, and 11 in a year and a day, many people who went for the ‘immediate’ option in the first case now go for the second option (Montier, 2007, p. 13–14)

• Deferring consumption involves **self-control**, and is related to **mood** and **feelings**. There is evidence that discount rates are sometimes remarkably high, that gains are discounted more heavily than losses, that small magnitudes are discounted more heavily than large, that the framing of a choice as a delay versus an advance has a large effect on decisions, and that time preference differs greatly in different decision domains.
Prospect theory

- In prospect theory (Kahneman and Tversky, 1979 and Tversky and Kahneman, 1992), individuals maximize a weighted sum of “values” analogous to utilities, where the weights are functions of probabilities.

- *Prospect theory* is one of the most often quoted and best-documented phenomena in economic psychology. The theory states that we have an irrational tendency to be less willing to gamble with profits than with losses.

- The tendency to seek risk when faced with possible losses, and avoid risk when a certain gain is possible.
III. INVESTOR TYPES
Standard finance theory is designed to provide mathematically elegant explanations for financial questions that are often complicated by imprecise, inelegant conditions. The standard finance approach relies on a set of assumptions that oversimplify reality. Standard finance, basically, is built on rules about how investors should behave, rather than on principles describing how they actually behave.

Behavioral finance attempts to identify and learn from the human psychological phenomena at work in financial markets and within individual investors.

4 behavioral investor types:
- Preservers
- Followers
- Individualists
- Accumulators
STEP 1: Identify a Client’s Active or Passive Traits

ACTIVE/PASSIVE TRAITS QUIZ

1. Have you earned the majority of your wealth in your lifetime?
   a. Yes
   b. No
2. Have you risked your own capital in the creation of your wealth?
   a. Yes
   b. No
3. Which is stronger: your tolerance for risk to build wealth or the desire to preserve wealth?
   a. Tolerance for risk
   b. Preserve wealth
4. Would you prefer to maintain a degree of control over your investments or prefer to delegate that responsibility to someone else?
   a. Maintain control
   b. Delegate
5. Do you have faith in your abilities as an investor?
   a. Yes
   b. No
Step 2: Risk Tolerance Questionnaire

![Risk Tolerance and Active/Passive Scale](image)
Figure: The original behavioral investor type diagnostic process
STEP 3: Test for Behavioral Biases

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<thead>
<tr>
<th>General Type</th>
<th>Passive</th>
<th>Active</th>
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<tbody>
<tr>
<td>Risk Tolerance</td>
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<td>Growth</td>
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<tr>
<td>Bias Type</td>
<td>Primarily Emotional</td>
<td>Primarily Cognitive</td>
</tr>
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<td>Behavioral Investor</td>
<td>Preserver</td>
<td>Follower</td>
</tr>
<tr>
<td>Type</td>
<td>Endowment</td>
<td>Hindsight</td>
</tr>
<tr>
<td>Biases</td>
<td>Loss Aversion</td>
<td>Framing</td>
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<td></td>
<td>Status Quo</td>
<td>Cognitive Dissonance</td>
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<td></td>
<td>Anchoring</td>
<td>Recency</td>
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<td></td>
<td>Mental Accounting</td>
<td>Regret</td>
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</tbody>
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**FIGURE 6.2** Biases Associated with Each Behavioral Investor Type


<table>
<thead>
<tr>
<th></th>
<th>PRESERVER</th>
<th>FOLLOWER</th>
<th>INDEPENDENT</th>
<th>ACCUMULATOR</th>
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<tr>
<td>COGNITIVE BIASES—GENERAL STABLE ACROSS BITS</td>
<td>Mental Accounting</td>
<td>Recency</td>
<td>Conservatism</td>
<td>Illusion of Control</td>
</tr>
<tr>
<td>Anchoring</td>
<td>Availability</td>
<td>Confirmation</td>
<td>Outcome Bias</td>
<td></td>
</tr>
<tr>
<td>EMOTIONAL BIASES—ARE ASSOCIATED WITH CERTAIN BITS BUT ARE UNSTABLE AND CAN BE PRESENT IN ANY BIT AT ANY TIME</td>
<td>Loss Aversion</td>
<td>Regret</td>
<td>Overconfidence</td>
<td>Self Control</td>
</tr>
<tr>
<td>Status Quo</td>
<td>Optimism</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**BITs = Behavioral Investor Types**
• Name of Behavioral Investor Type: **Preserver**

• **Basic Orientation**: Loss averse and deliberate in decision making

• **Dominant Bias Types**: Emotional, relating to fear of losses and inability to make decisions/take action

• **Impactful Biases**: Loss Aversion and Status Quo

• **Investing Style**: Wealth preservation first, growth second

• **Level of Risk Tolerance**: Generally lower than average
• **Name of Behavioral Investor Type**: Follower

• **Basic Orientation**: General lack of interest in money and investing and typically desires direction when making financial decisions.

• **Dominant Bias Type**: Cognitive, relating to following behavior.

• **Impactful Biases**: Recency and Framing

• **Investing Style**: Passive

• **Level of Risk Tolerance**: Generally lower than average but often thinks risk tolerance level is higher than it actually is.
• **Name of Behavioral Investor Type**: Independent

• **Basic Orientation**: Engaged in the investment process and opinionated on investment decisions.

• **Dominant Bias Type**: Cognitive, relating to some pitfalls associated with doing one’s own research.

• **Impactful Biases**: Confirmation and Availability

• **Investing Style**: Active

• **Level of Risk Tolerance**: Generally above average but not as high as aggressive investors.
• **Name of Behavioral Investor Type:** Accumulator

• **Basic Orientation:** Interested and engaged in wealth accumulation and confident in investing ability.

• **Dominant Bias Types:** Emotional, relating to overconfidence and desire for influence over investment process.

• **Impactful Biases:** Overconfidence and illusion of control.

• **Investing Style:** Actively engaged in decision making.

• **Level of Risk Tolerance:** High to very high.
IV. CONCLUSION

• In a world where investors make decisions based on their subjective probabilities, psychological factors can play an important role in explaining investor behavior.

• Different experimental settings can lead to under- or over-reliance on new signals; people seem to make judgments differently in different situations.

• A large literature shows that real-world decision makers do not predict outcomes as well as mechanical decision rules based on simple linear combinations of objective input measures.
**Heuristic** is a mental shortcut used to solve a particular problem; it is a quick, informal, and intuitive probability your brain uses to generate an approximate answer to a reasoning question.

**Heuristics are helpful,** because they allow us to quickly make sense of a complex environment, **but sometimes they fail at making a correct assessment of the world.**

When our heuristics fail to produce a correct judgment, it can sometimes **result in a cognitive bias (kink),** which is the tendency to draw an incorrect conclusion in a certain circumstance based on cognitive factors.
The **self-deception theory** suggests that a tendency to adjust attitudes to match past actions is a mechanism designed to persuade the individual that he is a skillful decision maker (Nel, Helmreich, and Aronson, 1969; Steele and Liu, 1983).
• **Self control** bias can also be described as a conflict between people’s overarching desires and their inability to act concretely in pursuit of those desires.

• **Emotions** are associated with impulsive, thoughtless or automatic response tendencies.
ADVICES:

Preservers: Preservers need big-picture advice, and often they require behavioral coaching as opposed to strict financial or investing education.

Followers: Advisors need to lead Followers to take a hard look at behavioral tendencies that may cause them to overestimate their risk tolerance.

Individualists: Because Independent biases are mainly cognitive, education on the benefits of portfolio diversification and sticking to a long-term plan is usually the best course of action.

Accumulators: For advisors, a reasonable approach to dealing with these clients is to take a leadership role in the situation.
«The mind has great influence over the body, and maladies often have their origin there».

Jean Baptiste Molière
APPENDIX
Confirmation Bias

Confirmation bias is a belief perseverance bias in which people tend to look for and notice what confirms their beliefs, and to ignore or undervalue what contradicts their beliefs. This behavior encompasses aspects of selective perception and is an all-too-natural action in which people convince themselves of what they want to believe by giving more weight to evidence that supports their beliefs and ignoring or modifying evidence that conflicts with their beliefs.
Representativeness Bias

Representativeness bias is a belief perseverance bias in which people tend to classify new information based on past experiences and classifications. They believe their classifications are appropriate and place undue weight on them. This bias occurs because people attempting to derive meaning from their experiences tend to classify objects and thoughts into personalized categories. When confronted with new information, they use those categories even if the new information does not necessarily fit.
Illusion of Control Bias

Illusion of control bias is a bias in which people tend to believe that they can control or influence outcomes when, in fact, they cannot. Langer defines the illusion of control bias as the “expectancy of a personal success probability inappropriately higher than the objective probability would warrant.” Langer finds that choices, task familiarity, competition, and active involvement can all inflate confidence and generate such illusions.
Availability Bias

Availability bias is an information processing bias in which people take a heuristic (also known as a rule of thumb or a mental shortcut) approach to estimating the probability of an outcome based on how easily the outcome comes to mind. Easily recalled outcomes are often perceived as being more likely than those that are harder to recall or understand. People often unconsciously decide the probability of an event by how easily they can recall a memory of the event. The fundamental issue is that many people are biased in their memories. For instance, recent events are much more easily remembered and available.
Outcome Bias

Outcome bias refers to the tendency of individuals to decide to do something—such as make an investment in a mutual fund—based on the outcome of past events (such as returns of the past five years) rather than by observing the process by which the outcome came about (the investment process used by the mutual fund manager over the past five years). An investor might think: “This manager had a fantastic five years, I am going to invest with her,” rather than understanding how such great returns were generated or why the returns generated by other managers might not have had good results over the past five years.
Recency Bias

Recency bias is a cognitive predisposition that causes people to more prominently recall and emphasize recent events and observations than those that occurred in the near or distant past. Suppose, for example, that a cruise passenger peering off the observation deck of a ship spots precisely equal numbers of green boats and blue boats over the duration of the trip. However, if the green boats pass by more frequently toward the end of the cruise, with the passing of blue boats dispersed evenly or concentrated toward the beginning, then recency bias would influence the passenger to recall, following the cruise, that more green than blue boats sailed by.
Status Quo Bias

Status quo bias, coined by Samuelson and Zeckhauser, is an emotional bias in which people do nothing (maintain the status quo) instead of making a change. People are generally more emotionally comfortable keeping things the same than they are with change, and thus do not necessarily look for opportunities where change is beneficial. Given no apparent problem requiring a decision, the status quo is maintained.
Endowment Bias

Endowment bias is an emotional bias in which people value an asset more when they hold rights to it than when they do not. Endowment bias is inconsistent with standard economic theory, because the price a person is willing to pay for a good should equal the price at which that person would be willing to sell the same good. However, psychologists have found that when asked, people tend to state minimum selling prices for a good they own but exceed maximum purchase prices that they are willing to pay for the same good. Effectively, ownership “endows” the asset with added value.
Affinity Bias

Affinity bias refers to an individual’s tendency to make irrationally uneconomical consumer choices or investment decisions based on how they believe a certain product or service will reflect their values. This idea focuses on the expressive benefits of a product rather than on what the product or service actually does for someone (the utilitarian benefits). A common example of this behavior in the consumer product realm is when one purchases wine. A consumer may purchase a fine bottle of well-known wine in a restaurant or wine shop for hundreds of dollars to impress their dinner guests, while a bottle that costs much less could be equally delicious but would not convey the same status.