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THE ADVERSE FINANCIAL EFFECTS OF NEGATIVITY BIAS IN THE AGE OF A.I.

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Abstract:

In the present era, there is almost no limit to the potential for creating financial data that can be used to analyze the investment potential of a wide variety of asset classes. Data that examines financial assets and investment portfolios is presented in a variety of forms, from fundamental analysis that examines the business prospects for the underlying asset, to technical analysis which examines quantitative price behavior, to alternate forms of analysis that use other data forms to determine investment strategies.

One factor that is often omitted in the complex and intricate process of financial analysis is the ever-present cognitive tendency known as "Negativity Bias". This negativity bias refers to the human tendency to pay greater attention to, remember, and be affected by negative information compared to positive information. This white paper aims to explain the intricacies of negativity bias in financial investing, exploring its origins, mechanisms, and its implications for investors and financial markets.

The first section of this white paper provides an overview of the negativity bias phenomenon, tracing its evolutionary roots and explaining its adaptive significance in human survival. By highlighting the psychological mechanisms underlying the bias, such as heightened attention and emotional arousal, we aim to establish a foundational understanding of how it manifests in financial decision-making processes.

The second section focuses on the impact of negativity bias in financial investing. Through our analysis of existing research and empirical evidence, we explore how the bias influences various aspects of investment behavior. We examine its role in risk perception, asset allocation, portfolio diversification, and the evaluation of investment outcomes. Additionally, we discuss the implications of negativity bias for individual investors, institutional investors, and the overall functioning of financial markets. The section also sheds light on the potential pitfalls associated with excessive sensitivity to negative information and the detrimental effects it can have on investment performance.

In the third and fourth sections, we present strategies and techniques that can be employed to mitigate the detrimental effects of negativity bias on financial decision-making. Drawing from insights in behavioral finance and psychology, we explore the effectiveness of techniques such as cognitive reappraisal, decision-making frameworks, and mental accounting. We also discuss the role of technology and digital tools in assisting investors in overcoming negativity bias and making more rational and informed investment decisions.

The purpose of this white paper is to provide an analysis of negativity bias in financial investing, shedding light on its origins, manifestations, and implications for investors and financial markets. By understanding the cognitive mechanisms underlying the bias and exploring effective strategies for mitigating its impact, investors can enhance their decision-making processes and strive for better investment outcomes.

SECTION 1: <u>Anthropological Background:</u>

Negativity bias is deeply ingrained in human behavior and has been observed in a variety of ways. Any empirical examination of news reporting in most places throughout the world will present a recognizable, distinct and constant emphasis on negative and even frightening news stories. News editors are keenly aware that their audiences are much more likely to pay attention to negative or frightening news stories than those that focus on the positive. Behaviorists have referred to negative or depressing storylines as "attention magnets". This inescapable human characteristic is employed daily in the global news media but is often omitted in financial analysis.

Empirical Data:

The best known study of Negativity Bias was conducted by Paul Rozin (b.1936) a professor at the University of Pennsylvania, along with his colleague Edward Royzman, (b.1970) a senior lecturer also at the University of Pennsylvania. In November of 2001 they published their landmark paper "Negativity Bias, Negativity Dominance and Contagion". This paper first coined the phrase 'Negativity Bias".

Rozin and Royzman's work presented four factors that characterized Negativity Bias in human perception:

1) Negative potency: Negative entities are stronger than the equivalent positive entities. For example, a single negative event can have a more profound impact on our mood than a single positive event.

2) Steeper negative gradients: The negativity of negative events grows more rapidly with approach to them in space or time than does the positivity of positive events. For example, we are more likely to be scared by a snake that is approaching us than we are to be excited by a beautiful sunset that is approaching us.

3) Negativity dominance: Combinations of negative and positive entities yield evaluations that are more negative than the algebraic sum of individual subjective valences would predict. For example, if we are told that we have a 50% chance of getting a good grade on a test, we are likely to be more worried about failing than we are excited about the possibility of getting a good grade.

4) Negative differentiation: Negative entities are more varied, yield more complex conceptual representations, and engage a wider response repertoire. For example, there are many different types of negative emotions, such as fear, anger, sadness, and disgust. There are also many different ways to respond to negative events, such as fighting, fleeing, or freezing.

These biases have been observed across various domains, including memory, perception, and decision-making. To understand the origins and adaptive significance of the negativity bias, we need to delve into its evolutionary roots.

Blame it on our Ancient Ancestors:

The human tendency toward negativity bias can be traced back to our early ancestors who lived in challenging and potentially life-threatening environments. In these circumstances, survival depended on being constantly vigilant and able to detect and respond to potential dangers. Paying more attention to negative stimuli, such as predators, threats, and hazardous situations, increased the chances of survival and reproduction. Those who were better at recognizing and avoiding dangers were more likely to pass on their genes, leading to the persistence of this bias over generations.

The adaptive significance of negativity bias lies in its ability to enhance human survival in several ways. First, the bias helps in the rapid and efficient processing of threatening stimuli. By prioritizing negative information, our ancestors could react quickly to potential dangers, enabling them to take appropriate action, such as fleeing or defending themselves. This heightened sensitivity to negative cues increased their chances of survival and reduced the risk of harm.

Second, negativity bias contributes to the formation and retention of strong memories related to negative experiences. This memory advantage allows individuals to learn from past threats and avoid similar situations in the future. The ability to remember and recall negative events is crucial for adaptive decision-making and reducing the likelihood of repeating costly or dangerous mistakes.

Negativity bias

When I have to assess a situation, negative events weigh more in the balance than positive events.

Author: Nicolaï Abramovich

Prospect Theory:

Prospect theory is a psychological theory that explains how people make decisions under uncertainty. It was first proposed by psychologists Daniel Kahneman and Amos Tversky in 1979 as an alternative to the traditional rational choice theory. Prospect theory suggests that people's decisions are influenced not only by the potential outcomes or final states of a situation but also by the way those outcomes are framed and perceived.
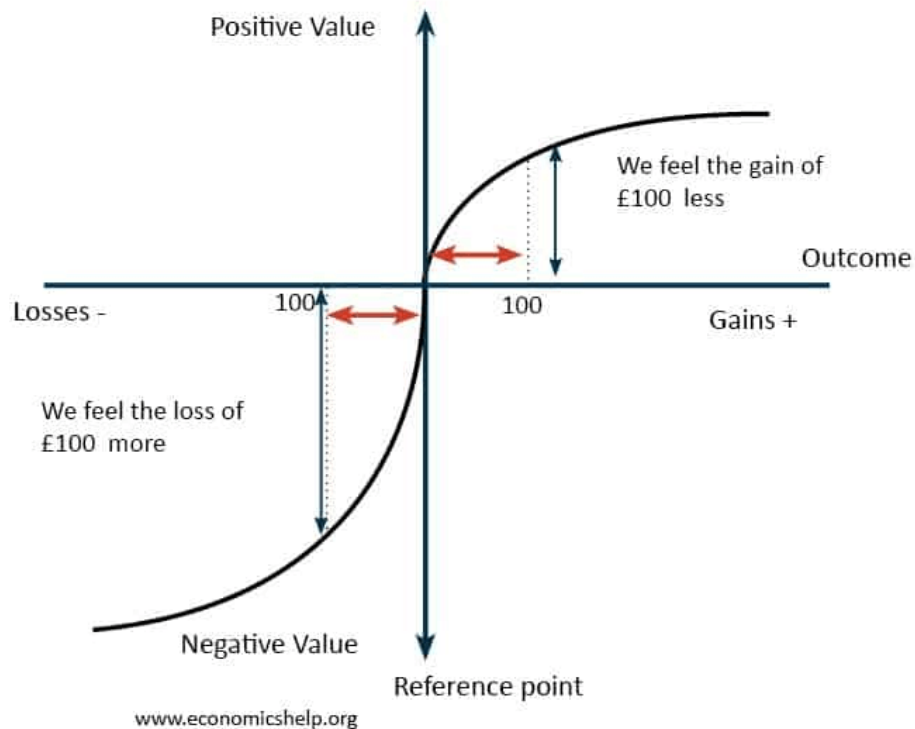
According to prospect theory, individuals evaluate potential gains and losses relative to a reference point, typically their current state or a neutral reference point. They perceive gains and losses differently and exhibit a systematic bias known as loss aversion. Loss aversion refers to the tendency for individuals to prefer avoiding losses over acquiring gains of equal value. In other words, the negative emotional impact of a loss is stronger than the positive emotional impact of an equivalent gain.

Prospect theory also proposes that individuals' decision-making is affected by the shape of the value function, which describes how people subjectively value gains and losses. The value function is typically concave for gains, meaning that the perceived value of additional gains diminishes as the amount increases. On the other hand, the value function is convex for losses, indicating that the perceived disutility of losses increases as the amount increases.

Another important concept in prospect theory is the framing effect. The way a decision or situation is framed can significantly influence people's choices, even if the underlying options or outcomes remain the same. For example, a decision presented as a potential gain may elicit a different response compared to the same decision framed as a potential loss, even when the objective outcomes are identical.

Overall, prospect theory provides insights into how individuals evaluate and make decisions under conditions of uncertainty. It highlights the role of cognitive biases, such as loss aversion framing effects, in shaping human decision-making.

A graphic of Prospect Theory is presented below:

Positive Value

We feel the gain of
£100 less

Outcome

Losses -   100   100   Gains +

We feel the loss of
£100 more

Negative Value

Reference point

www.economicshelp.org

"Doomsayer Syndrome"

In today's society, as well as through most previous eras in history, there have always been soothsayers of apocalypse and promoters of doomsday predictions. While some of these doomsayers have occasionally been proven correct, the vast majority of them are proven wrong in the fullness of time. Yet, people continue to believe in all manner of negative predictions, while positive or hopeful outlooks gain no such popularity.

People's fascination with predictions of doom can stem from various psychological and emotional factors. Here are a few reasons why some individuals might be drawn to such predictions:

Emotional arousal: Doom and gloom predictions can evoke strong emotional responses, such as fear, anxiety, and intrigue. Some individuals find these intense emotions to be stimulating or thrilling, and they may actively seek out content that elicits such reactions.

Sense of preparedness: By listening to doomsday predictions, people may feel a sense of preparedness and control. It allows them to mentally explore worst-case scenarios and consider strategies for dealing with potential threats. This sense of preparedness can provide a semblance of security and empowerment.

Confirmation bias: People often seek information that confirms their existing beliefs and biases. If someone already harbors a pessimistic view of the world, predictions of doom can align with their preconceptions and validate their concerns, reinforcing their beliefs and providing a sense of reassurance.

Social bonding and community: Sharing and discussing predictions of doom can create a sense of community among like-minded individuals. It can serve as a bonding experience, fostering a sense of belonging and shared purpose. People may find comfort and camaraderie in connecting with others who share similar concerns about the future.

Entertainment and escapism: For some, predictions of doom can serve as a form of entertainment or escapism. It's like indulging in a fictional narrative or movie plot, providing an immersive experience that engages the imagination and temporarily transports them to a different reality.

Some Participants Display Little Or No Negativity Bias:

While negativity bias is nearly universal in human behavior in various forms, there are time segments when negativity bias seems all but absent in collective market behavior. There is a segment of financial market players that display little or no negativity bias. These are usually speculators of various types, driven more by gambling psychology and wishful thinking than any rational form of optimism. An extreme example of a collective absence of negativity bias occurred in 2021 during the "meme" stock craze when many private and even some institutional speculators ran up the price of Game Stop, Bed Bath and Beyond (now defunct, Overstock.com purchased the brand name in 2023) and AMC among other questionable investments. This online crowd, some of which referred to themselves as "apes" displayed no discernable negativity bias during their speculative runup of stocks, and posted wildly optimistic projections on social media, encouraging even more risk taking by others wishing to jump on the bandwagon.

A relatively small number of these players made substantial profits, but most lost much or all of their stake as gravity invariably prevailed. There are a number of other cases where there seemed to be a collective lack of negativity bias in equity markets, including the 1998-2000 dot com run up, the 1920s leveraged stock rally and others.

Opportunism and Profiteering With Negativity Bias:

As we have seen, humans have a natural negativity bias, meaning they tend to pay more attention to negative information than positive information. Predictions of doom, with their focus on potential threats and catastrophes, can capture attention more readily than optimistic scenarios.

In addition, any attention that can be gained by alarming the public with predictions of doom can translate into financial gain on a large scale by way of books, films, videos, social media, podcasts, television and other communication channels, as many authors and commentators

have done in the past and on to today. It is reasonable to assume that some promoters of doomsday theories do not themselves truly believe their own narratives but find them very profitable and marketable to an often gullible and willing audience.

Negative News Dominance:

We know from various sources that news organizations and individual influencers on social media understand that they will gain more attention by emphasizing negative or frightening news or promoting various doomsaying predictions. This factor is well documented and is a staple of information channels throughout the world. For example, a study by the Pew Research Center found that the ratio of negative to positive news stories on network news broadcasts was 2.6 to 1 in 2012. Another study, by the University of California, Berkeley, found that the ratio of negative to positive news stories on the front pages of major newspapers was 3.5 to 1 in 2014.

Cognitive Dissonance:

Negativity bias may be related to cognitive dissonance. Leon Festinger, the famed social psychologist, forged his theory of Cognitive Dissonance at Stanford University in 1957. Cognitive dissonance behaviors may explain some tendencies toward developing Negativity bias.

The theory of Cognitive Dissonance is a groundbreaking psychological concept that explores the discomfort people experience when they hold conflicting beliefs or engage in contradictory behaviors. Festinger argues that individuals strive for consistency in their thoughts, attitudes, and actions, and when inconsistencies arise, they experience cognitive dissonance—an unpleasant psychological tension. To alleviate this dissonance, individuals may engage in various strategies, such as changing their beliefs, (such as assuming a negative attitude toward certain real world factors) seeking new information or minimizing the importance of the inconsistency. Festinger's theory has had a significant impact on our understanding of motivation, decision-making, and attitude change. It sheds light on why people often resist changing their beliefs, even in the face of contradictory evidence, and provides valuable insights into the complexities of human cognition and behavior.

Now that we have established the anthropological and psychological basis for why humans tend to skew their perceptions negatively, let's take a look at how Negativity Bias influences investor decision making in financial markets.

SECTION 2: Negativity Bias Effects on Financial Behavior:

If we now recognize that Negativity Bias affects human decision making, let us examine how it relates to the behavior of investors and speculators in their handling of financial affairs and in particular their investment money. We know that Negativity Bias is a cognitive phenomenon that prioritizes negative information over positive information that has significant implications in the realm of financial investing. This bias can influence investor behavior, decision-making

processes, risk perception, and portfolio management strategies. Understanding the impact of the negativity bias is crucial for investors to make informed and rational choices in the financial markets.

One of the key ways the negativity bias affects financial investing is through risk perception. We know that investors tend to assign more weight to negative events and potential losses than to positive events and potential gains. This bias leads to a heightened sensitivity to market downturns, economic crises, or negative news, which can result in increased fear and anxiety. As a consequence, investors may become overly cautious and risk-averse, leading to missed investment opportunities or suboptimal portfolio allocation. [Graphics credit MarkManson.net]

Moreover, the negativity bias can influence decision-making processes. When faced with uncertain or ambiguous information, investors are more likely to interpret it in a negative light. This bias can lead to hasty or irrational decisions, such as panic selling during market downturns or avoiding investments that have potential for growth but also involve some level of risk. As a result, the negativity bias can hinder long-term investment success and prevent investors from achieving their financial goals.

An Historical Example:

One historical example of where Negativity Bias influenced stock prices and investor psychology was in the April to December period of 2018. On Monday Oct 1st 2018, the S&P 500 index closed at 2885.57. Stocks had been rallying through the summer of 2018 advancing 10.6% since

April. The Federal Reserve had been raising interest rates to offset inflation fears, and on September 26th 2018 the Fed again raised the short term Federal Funds rate by 0.25% to 2.25%. The market reaction to this policy announcement started a wave of negative commentary suggesting a recession or even a "financial accident" akin to the 2008 financial disaster might occur if the Fed persisted in raising the Fed Funds rate. Stocks tumbled and continued their sell off into the fall and winter season. Prognosticators, news reporters and analysts predicted even lower prices ahead as downward momentum and negative expectations were accelerated into the downturn. An ongoing drumbeat of negativity filled the airwaves and social media. In reality, there had been no meaningful slowdown in economic activity in 2018. Nonetheless, the S&P 500 dropped to 2409.68 by Christmas Eve, a loss of 16.5% since April, casting a foreboding shadow over the 2018 holiday season.

Observing the gloomy mood of investors and fearing negative economic consequences from the stock slump, the Federal Reserve relented and announced that it would change its policy and begin to lower Fed Funds in 2019. Markets then reversed upward and began a rally that would last until early 2020 and the onset of the Covid-19 crisis. [citation-Focus 1-economics.com] . See chart of S&P 500 below showing negativity bias driven decline.

[credit graphics: Reuters.]

A Real Time Observation:

In our real-time work with clients at Kensington A.M.I., the subject of risk reduction is a primary subject of portfolio discussions. Clients, who come from many different backgrounds and circumstances, most of whom do not know each other, have consistently shown the same preference for lower volatility portfolio models than those offering enhanced chances of large capital gains but with more risk. By far the most popular portfolio model offered is the dividend

growth program we call "Dividend Power" which usually has a market "beta" or volatility of less than 1.0 to the S&P 500. This preference is likely the result of ingrained negativity bias on the part of both investor and advisor.

Negativity Bias Can Cause "Disposition Effect"

The investment disposition effect is a cognitive bias that causes investors to sell winning investments too early and hold onto losing investments for too long. This is because investors tend to feel more pain from losses than pleasure from gains, so they are reluctant to sell losing investments even when they are unlikely to recover.

The disposition effect can have a significant negative impact on an investor's returns. For example, a study by Brad Barber and Terrance Odean found that investors who exhibited the disposition effect earned an average of 1.5% less per year than investors who did not.

Barber and Odean's work demonstrates how one form of negativity bias influences investor decisions that measurably reduces long term investment performance

Memories:

Another way in which the negativity bias impacts financial investing is through the formation of strong and lasting memories related to negative experiences. Negative investment experiences, such as significant losses or financial crises, are more likely to be vividly remembered and influence future decision-making. This can create a reluctance to take risks or invest in similar assets, even if the circumstances have changed or the potential for positive outcomes exists. The bias towards negative memories can lead to an overly conservative investment approach, missing out on opportunities for growth and higher returns.

Anecdotal and historical accounts of the generation that was raised during the 1930s Great Depression era demonstrated a deeply engrained aversion to stock investing and most forms of financial risk that persisted throughout their lives, resulting in an uncalculated opportunity loss for millions of individuals and households during the 1950s-1960s bull market period.

Artificial Intelligence Implications for Negativity Bias in Portfolio Management:

Artificial intelligence (AI) has significant implications for investment markets, particularly in relation to the negativity bias. Here's how AI intersects with this bias:

Enhanced decision-making: AI algorithms can process vast amounts of data and make investment decisions based on objective analysis rather than emotional biases. By minimizing human involvement, AI can mitigate the impact of the negativity bias on investment decisions.

Neutralizing emotional biases: Emotions often drive investor behavior, leading to irrational decisions during market downturns or negative news events. AI-driven algorithms can help counteract such biases by relying on statistical models and predefined investment strategies, leading to more rational and consistent investment choices.

Data-driven analysis: AI-powered systems can analyze extensive datasets, including news sentiment, market trends, and historical patterns, providing investors with comprehensive insights. By incorporating sentiment analysis, AI can identify negative sentiment and assess its impact on investment opportunities, thereby partially mitigating, at least in theory, some of the negativity bias.

Behavioral finance applications: AI can be used to study and understand investor behavior, including the negativity bias, by analyzing historical market data and individual trading patterns. This knowledge can inform the development of AI models that account for such biases and improve investment decision-making processes.

Risk management: AI can enhance risk management strategies by identifying potential risks. A.I. proponents also assert that A.I. may be able to predict market downturns and rallies in advance. This claim is as yet unproven and may not account for innumerable random elements, (including impulsive human inputs) that may make any predictive operation of A.I. market forecasts less than reliable.

By incorporating risk models that account for negativity bias, AI systems may help investors navigate turbulent market conditions more effectively.

AI may offer the potential to mitigate the impact of negativity bias in investment markets behavior by providing objective analysis, neutralizing emotional biases, leveraging data-driven insights, studying behavioral finance, and improving risk management strategies.

The advantages offered by A.I. for investment management are only as good as their application by human operators. It is not yet known how humans would react to inputs by A.I. that do not agree with human emotional reactions. There may be an emotional conflict experienced by human users of A.I. investment algorithms if the product of A.I. data conflicts with natural human fight or flight reactions. The field of A.I. applications for investment management in 2023 is still at a nascent stage and there is no telling at this time to what degree humans will act upon A.I. data outputs when under emotional stress when assets prices are collapsing, or conversely, moments where animal spirits and risk appetites are especially strong. In the latter case, A.I. outputs may signal caution during a strong rally where profits seem easy to obtain but humans driven by irrational greed impulses may choose to ignore the warning furnished by A.I. algorithms and increase risk taking at the wrong moment.

SECTION 3: Recognition of How Negativity Bias Manifests in Investment Psychology

Now that we have established that there is a known negativity bias in many human calculations of possible financial risk and hazard, we need to establish a useful mechanism to recognize the allocation distortions in financial portfolios caused by negativity biases. In order to accomplish this goal we will need to estimate what a negativity bias adjusted modified portfolio structure would look like and create a mechanism to adjust for negativity bias.

Variable Levels of Negativity Bias:

If everyone had exactly the same level of negativity bias in managing financial portfolios, a devised mathematical equation to adjust for it would be easy to develop. But as each person has a different and often unique level of negativity bias, there is no one easy solution to the question of how to adjust for negativity distortion. Below are factors that can influence variability bias in differing classes of investors:

1) Financial fear can increase with age:

As investors near retirement and the cessation of their primary income from employment, there is a distinct tendency toward a more conservative investment approach. While a more conservative stance in portfolio allocation by itself does not constitute a manifestation of negativity bias, an older investor may subconsciously acquire a more negative view on the investment environment to justify and rationalize their more conservative positioning.

2) Professional career and business risk assumed by investment professionals and its influence on portfolio construction:

Many retail and institutional investment managers tend to lean toward more conservative portfolio models in order to protect their clients from loss due to their fiduciary obligations. They also have an incentive to skew conservatively in portfolio modeling to protect their franchises. Investors are much more sensitive to capital losses than to any satisfaction from investment gains. Investment managers know this and often structure portfolios to protect clients from large capital losses that may motivate the client to find another investment manager. This often causes investment managers to be more sensitive to negative news and market conditions and may inadvertently underexpose clients to potential gains.

3) Political and Ideological prejudices influence investment decisions:

Quite often, investors are influenced by their political and ideological beliefs and express these in their selection of investments. We have seen this phenomenon play out in a big way in the "ESG" (Environmental-Social-Governance) trend of the last several years, which has allocated large pools of investment capital in a progressive socio-political direction. Also, many conservatives have expressed their own political feelings by purchasing shares of conservative leaning companies such as petro-energy and aerospace-defense, while avoiding companies with a more cosmopolitan image (such as Nike or Starbucks.) . Both sides in this phenomenon

sometimes rate making a socio-political statement with their investment dollars as important to them as their overall investment results. Thus, these investors think in terms of the negative aspects of investments they dislike on socio-political grounds rather than what would be more positive for their overall financial well-being.

4) Financial illiteracy and conspiracy theories influence investor confidence

For many private investors the complex world of finance is perplexing and often difficult to understand. Financial illiteracy and fear of losses due to unscrupulous behavior by some financial operators can lead some potential participants to an overall negative perception of the entire investing environment. Traditional mistrust of bankers, Wall Street traders, government agencies such as the Federal Reserve and other perceived financial threats enable this form of negativity bias. These irrational fears can leave an individual investor vulnerable to belief in various conspiracy theories, paranoia and resentment of certain ethnic groups, and a perception of a general lack of opportunity in what they see as a financial bonanza from which they are systematically excluded. These factors can lead to an embedded negativity bias among certain subsets of the investing public.

News reporting factors over time offer multiple reasons to avoid investing:

50 years of reasons not to invest

Source: MSCI

Social Media Effects on Negativity Bias:

We know that social media has become an integral part of modern society, connecting people and shaping their behaviors and perceptions. However, when it comes to investor psychology, social media platforms can have demonstrable negative effects that can influence investment decisions and market dynamics.

Firstly, social media platforms are inundated with a vast amount of information, opinions, and rumors that can create a highly volatile and unpredictable investment environment. This constant flow of emotional inputs can lead to information overload, making it difficult for investors to filter out noise and make rational decisions. The fear of missing out (FOMO) on potential investment opportunities or fear of losses resulting from irrational paranoia caused by forces or institutions the investor fears or despises can drive impulsive decision-making, leading to increased market volatility.
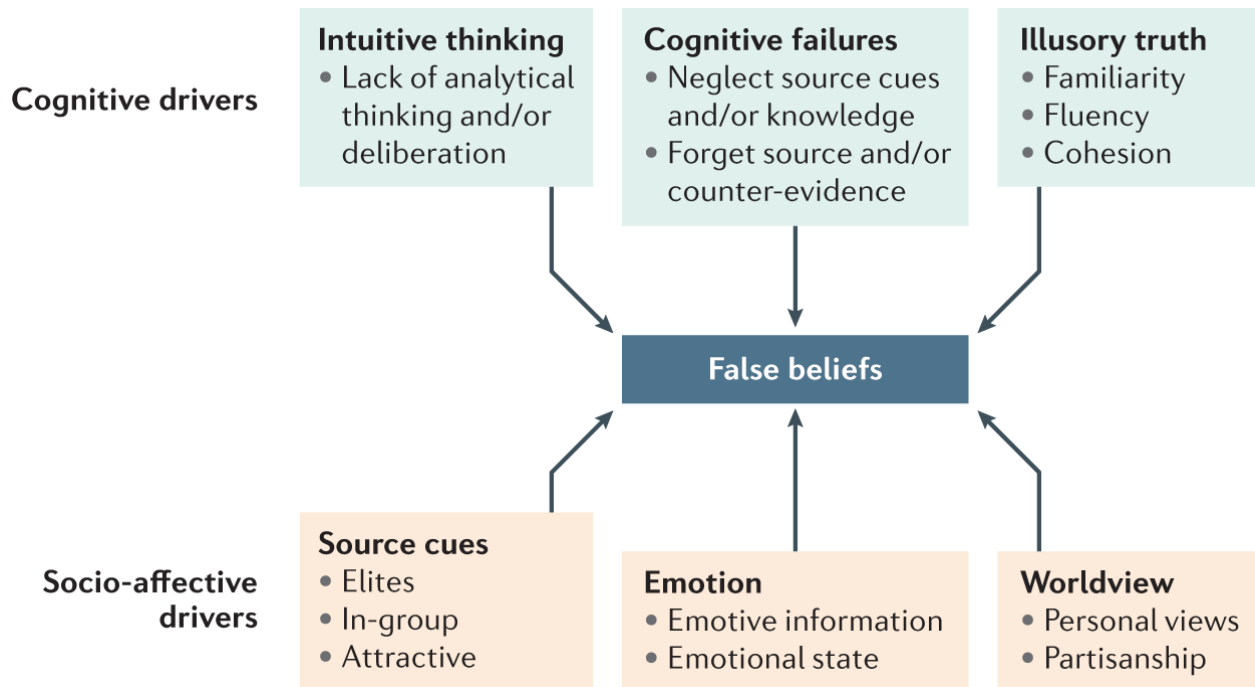
Secondly, social media platforms have empowered individuals to voice their opinions and share investment advice without necessary expertise or accountability. This can result in the spread of misinformation, biased analysis, and unverified rumors. False or misleading information can influence investor sentiment and distort market perceptions, leading to irrational exuberance or excessive pessimism. These trends can fuel speculative bubbles or trigger panic selling, causing significant market disruptions.

Confirmation bias: Social media algorithms are designed to show users content that they are likely to agree with, (negatively skewed narratives) which can lead to confirmation bias. This is the tendency to seek out and interpret information that confirms our existing beliefs, while ignoring or rejecting information that contradicts them. Confirmation bias can lead investors to make poor investment decisions, as they are more likely to buy assets that they hear are going to go up and sell assets that they hear are supposed to be going down according to the chatter they read on social media.

Furthermore, social media platforms facilitate herd mentality among investors. People tend to follow the crowd and seek validation from others, leading to a phenomenon known as "groupthink." This herd behavior can amplify market trends, making them more pronounced and short-lived. It can also discourage critical thinking and independent analysis, as individuals may be swayed by the opinions of influencers or social media "gurus" rather than conducting their own due diligence. Thus, social media has become a publicity playground for all manner of financial charlatans.

The constant exposure to social media can trigger irrational emotional responses, such as fear, greed, and impatience, which can cloud investors' judgment. Social media feeds are often filled with success stories, extravagant lifestyles, and instant riches, creating unrealistic expectations and fostering a gambling mentality. It can also trigger feelings of envy and exclusion, exacerbating negative psychology. This can lead to impulsive trading, excessive risk-taking, and a lack of long-term perspective, undermining sound investment strategies.

Cognitive drivers	**Intuitive thinking** • Lack of analytical thinking and/or deliberation	**Cognitive failures** • Neglect source cues and/or knowledge • Forget source and/or counter-evidence	**Illusory truth** • Familiarity • Fluency • Cohesion

False beliefs

Socio-affective drivers	**Source cues** • Elites • In-group • Attractive	**Emotion** • Emotive information • Emotional state	**Worldview** • Personal views • Partisanship

[Graphics credit: Nature Magazine]

Correlation of One: High Stress Situations Accelerates Negativity Bias

In rapid downturns of stock prices due to unexpected negative news or some financial accident, diversification strategies often fail as asset categories move to a "Correlation of One" . While this factor is sometimes used to compare the prices of two distinct assets, (expressed as a range between -1 and +1), it can also refer to a general panic where all asset classes decline at once as investors race to exit positions.

In a correlation of one situation, such as the March 2020 panic selloff at the onset of the Covid-19 crisis, most asset classes were sold no matter what their particular characteristics might have been. In such a case, negativity bias becomes the only behavior driver, manifesting in a classic panic and crash situation.

Shortly after the panic selling of March 2020 during the onset of the Covid 19 crisis, markets shot upward in a powerful and long lasting rally after word of massive US Government intervention to rescue the economy. The widespread negativity behavior during the initial panic cleared markets of over positioning and liquified investor accounts, setting the stage for a reversal of negativity bias. Investors who sold in panic at the onset of the crisis were forced to chase assets upward as a tidal wave of Federally provided money powered prices higher.

Traditional risk mitigation and diversification techniques usually do not work well when correlation approaches one, when negativity is the sole motivator.

Section 4: Strategies and Techniques to Mitigate Negativity Bias in Financial Management

Looking at how a simplified model for adjusting for negativity bias can be imagined, there are some possibilities. One approach is to install a numerical factor into investment portfolios to account for negativity bias. This is called a negativity bias adjustment. The adjustment can be calculated using a variety of methods, but the most common approach is to use a ratio of negative to positive news. For example, if the ratio of negative to positive news is 2:1, then the negativity bias adjustment would be 0.5. This means that the investor would need to overweight positive news by 50% to account for their negativity bias.

But how do you accurately quantify negative vs. positive news reports ? Given that we have already established that news organizations and online sources are motivated to report more negative news than positive news, and that the positive/negative news ratio is highly variable, the 2:1 ratio does not appear to be reliable enough to create a negativity discounting mechanism.

Portfolios that consistently underperform the S&P 500 or other recognized benchmark may have an imbedded negativity bias. But underperformance can manifest in a number of other ways, such as poor asset selection, incorrect allocations, short term tactical errors or mismanagement of volatility. In these cases, negativity bias was not the cause of portfolio underperformance. It is only when negativity bias is identified as the cause of portfolio deficiency should assets be adjusted to correct for negativity bias.

Is it possible to devise a formula for "Nq"; a "Negativity Quotient" ?

If investors are to recognize that negativity bias plays a role in how they allocate their investment portfolios, then a quantification of their negativity bias may be useful. For the purpose of this paper, we will use the figure "Nq" to represent a "Negativity Quotient", or a quantitative figure that represents an investor's variable negative bias versus unadjusted outcomes.

The VIX (Volatility Index), is a widely utilized options-driven index originating at the Chicago Board Options Exchange. It is cited daily as an indicator of fear and greed based upon options trading in put and call contracts based on the S&P 500. The VIX, which follows volatility, may be used as one indicator of the level of Nq present in the short term oriented options market, but not necessarily in all portfolios, especially longer term plans. The VIX tends to follow and not lead market direction.

Recognition and Implementation of Nq Factor May Cause Distortions

While formulating an algorithm or mathematical equation for calculating Nq is beyond the scope of this white paper, it would pay to consider the possible consequences of such a mechanism being recognized by investors. Considering the many variables imbedded in any notion of Nq, any universal numerical value or formula to calculate a fixed or variable value to Nq portfolio modification is probably not practical.

Any fixed or variable calculation of a widely used universal Nq factor adopted by investors and portfolio managers would likely cause a change in market dynamics that would react to the modification of positioning installed by any value of Nq. Thus, Nq modifications would likely be mitigated by market adjustments reacting to the installation of Nq.

There is no telling what such a market reaction would look like, since it would probably take the form of increased risk allocations, which would in turn cause portfolio managers to increase risk mitigation in times of falling prices, causing a further distortion in the price of hedging instruments and other unknown market disruptions.

Individuals and asset managers may find they will need to adjust their Nq as needed, as market sentiment constantly shifts. They would also need to recognize that Nq feels the strongest when markets are stressed and is more relaxed when asset prices are gaining. This refers in particular to the variability of Nq. Every participant may have a different recognition factor due to their variable risk tolerance and their imbedded tendencies. Nq is a cognitive device and not a mathematical component.

If investors and asset managers wish to account for Nq in the construction of portfolios, they will not need to arbitrarily assign a fixed or variable mathematical value. The more practical approach is to simply recognize Nq as one more element in portfolio construction, which may manifest as a variable deficiency to allocation of risk. This variable is likely quite small in most cases. For example, a generic 60% equity and 40% fixed income portfolio may be adjusted to 63% equity and 37% fixed income to account for Nq.

The above example is generic and does not account for many other investment and financial planning variables such as investor age, risk tolerance, market price levels, interest rates and a number of other factors. Thus, Nq is more a notional value than a mathematical one.

Section 5: Conclusion:

We know from empirical evidence that humans are prone to negativity bias. In the first section of this paper we have demonstrated that there are deeply engrained anthropological traits that resulted from natural selection that drives human psychology toward negative thinking for reasons of survival and procreation. In modern times however, negativity bias has become a daily obsession for countless people of all political and social beliefs around the world who indulge in an infinite echo chamber of negative news, pessimistic predictions and conspiracy theories. Technology and in particular social media has placed a constant drumbeat of fear, paranoia and negativity into the minds of billions of people throughout the world.

In the second section we outlined how negativity bias manifests in certain negative thoughts and actions that influence financial and investment behavior. Investment plan distortions can take the form of Disposition Effect, panic exits from invested positions and an over dependance on a short term mentality that often results in lost money or underperformance.

In the third section we explored how negativity bias influences financial psychology. Advancing age of individual investors, ongoing negative news reporting, political and ideological prejudices and financial illiteracy all contribute to variable negativity bias.

In the fourth section we examined how investors and asset managers may recognize and consider negativity bias in their investment calculations. We introduced devices such as Nq for investors to use in order to try to quantify negativity bias.

We also looked at Implications for A.I. and how it may change the investment environment by attempting to take emotional reactions in the form of negativity bias out of the investment allocation equation and replace it with more rational management.

Sociological Consequences of Negativity Mentality

There has always been negative thinking among humans both individually and in groups. Negative mentality can sometimes help one prepare for the worst and may enhance survival in certain extreme circumstances, but in day to day life, an attitude of negativity may be harmful to one's own health, wellbeing and to society in general. The great accomplishments of our civilization were not built on negativity. Positive attitudes are routinely associated with all forms of positive achievement for a reason; positive attitudes can increase chances for success, while negativity invites failure. This is true in financial affairs at least as much as in other human endeavors.

The modern preoccupation with social media, 24 hour news cycles and other negative hyperbole has demonstrated that it can lead to isolation, anger, resentment, envy and a variety of other negative feelings. This current environment is unlike that in any previous era when negative messaging was limited to the very localized means of pre-modern communication. The information overload of today is something new.

There are to be sure, many positive messages on all forms of media as well, but as we have seen, these positive narratives do not receive the same attention as do negative stimuli.

As a society and as individuals, we need to recalculate our collective Nq so that we realize that we are being influenced in a negative direction by information overload and that a course correction is necessary. We need to start thinking about installing something like a Positivity Bias (Pb) in our current and future outlook.

Nothing less than the future of our civilization may depend on it.