



## Recognizing and Combatting Biases in Investing

October 2021 – Explorations

**“The investor’s chief problem – and even his worst enemy – is likely to be himself.” - Benjamin Graham, Market Legend**

**True story:** A father and son are caught stealing a TV. There is no question they did it. The father had four prior convictions, including assaulting a police officer. The son had one traffic conviction and claimed his father told him that a friend gave him the TV.

Forty-seven judges reviewed this case and others in a study focused on understanding the degree of sentencing disparity in the judicial system. There was more uniformity on what to do with the dad: all believed he was guilty. Recommended sentences ranged from 30 days to five years – quite large! The son’s case is a bit more complex, and not surprisingly, the recommendations of the judges were quite mixed: 57% (27) of the judges voted guilty while 43% (20) voted not guilty. Of those who voted guilty and provided further guidance: 39% recommended jail time, 43% partially suspended jail time and 17% no jail time<sup>1</sup>.



Some interesting items that may assist the son:

- Defendants appearing for sentencing on their birthday get lighter sentences – so while it seems like a rather miserable way to spend a birthday getting sentenced, it is really good long-term!
- Hope the local team won – judges issue harsher sentences after the local football team loses
- If requesting asylum, the colder it is outside the better the request goes – perhaps some empathy?!

Conceptually, two judges can have identical biases but land on an entirely different penalty. This would be termed “noise” as defined by Professor Daniel Kahneman, Olivier Sibony and Cass R. Sunstein in their book *“Noise: A Flaw in Human Judgement”*. Bias would result in an average of a measurement that is different from what it should be while noise defines the variability of the results around that average. For example, in a population with a majority and minority group of people and a subjective test, let’s say a book report, an English teacher

Question 1:

A bat and a ball cost \$1.10 in total. The bat costs \$1.00 more than the ball. How much does the ball cost?

Keep reading to find out the answer!

<sup>1</sup> [A Survey of Judges' Responses to Simulated Legal Cases: Research Note on Sentencing Disparity \(northwestern.edu\)](https://www.northwestern.edu/news-center/stories/2015/06/sentencing-disparity.html)



may unconsciously provide a higher average to the majority group compared to the minority group – let's say a 90 vs an 80. This is the bias. Grades would cluster around these respective scores. This is the noise. While we will primarily focus on biases in this exploration, it is important to understand the concept of noise which provides both further variability and complexity in problem solving.

Given how all over the place sentencing is, an algorithm providing consistent and clear guidance seems like a great idea. And indeed, there are a number of artificial-intelligence-based (AI) computer programs or algorithms to support sentencing recommendations for convicted criminal defendants. Problem solved! However, these programs and the judges using them, have come under fire for a variety of reasons surrounding biases (but not for noise which a program should really help with!) For instance, all the programs rely to some extent on historical data in making future predictions of recidivism<sup>2</sup> and many are based on outdated notions and philosophies that may bias against a subset of members of our society.

The terms “quantitative,” “algorithmic,” “artificial-Intelligence based,” and the like, are used frequently in investing. They invoke a level of sophistication, expertise, and “smarts.” They also often invoke individuals not versed in programming to be intimidated by these terms though they really are just recipes for an outcome. A set of “if this, then that,” creating consistency in a process.

Quite often, our brain tends to jump to conclusions and rushes to solve a problem, which may lead to errors. In order to reduce the number of errors, there needs to be thought and analysis. This is where System 1 and System 2 thinking come in. System 1 “is the brain’s fast, automatic and intuitive approach,” while System 2 refers to “the mind’s slower, analytical mode, where reason dominates.”<sup>3</sup> Algorithms are generally System 2 ways of thinking. But an algorithm is simply a process. When you get up in the morning your brain uses a very sophisticated algorithm to decide what to wear: Is it cold or hot outside? Will it rain? Who am I meeting? What am I doing?

- Original algorithm: “If cold, recommend a jacket”
- Updated quantitative algorithm: “If cold, check history, recommend what people most frequently wear on cold days”
- AI quantitative algorithm: “Here is a set of data, find patterns, answer my questions”

The point is, there are always inputs in programs and processes and these inputs are easily **biased by us!** The inputters! Sometimes on purpose, by the way....

Cognitive biases affect pretty much everything humans do. Daniel Kahneman won a Noble Prize for applying psychological insight to economic theory, particularly in the areas of judgment and decision-making under uncertainty. In writing this, we

Answer 1:

\$0.05.

We have two systems that play separate roles in our mind. System 1 is automatic and impulsive. It is quick to make decisions and works in the background. System 2, however, is more conscious and aware. It takes a problem, analyzes it, and gives it considerable thought before generating a solution.

In this question, many are quick to answer this with “10 cents” because the sum separates into \$1 and 10 cents. This is impulsive and is a result of System 1 rushing to solve the problem with superficial thought. The error also shows how little System 2 monitors System 1. The fact that the two systems, on occasion don't work together results in errors.

We tend to lean on System 1 which more often than not, leads us to errors. If we consciously take some time and think hard (using System 2 instead of trusting a plausible judgement by System 1), there is a higher chance we will come up with the right answer. Rushing to a solution may lead to error. Take time, put in effort, and try to find the solution.

<sup>2</sup> I highly recommend the movie Minority Report with Tom Cruise for an idea of where this can go.

<sup>3</sup> Daniel Kahneman, speaking at the Harvard Business School in 2014.



leaned heavily on his book, “Thinking, Fast and Slow” as well as “Noise” (which just came out). Which of the following biases might you have?:

- **Anchoring:** The act of focusing on a reference point, typically a first impression, in making a decision or taking a view. It is why that first piece of marketing from a company is so important.
- **Bandwagon Effect:** Typical following-the-crowd tendencies.
- **Hindsight Bias / Gambler’s Fallacy / Survivorship Bias:** All elements of relying way too much on history, or how history has been told, in making future decisions.
- **Loss aversion / Endowment Effect:** The overvaluation of items already in our possession and the unequal application placed on risk – reward decisions.

Unfortunately, the above list is inherent for all of us! But, of course, we are biased to believe we aren’t biased. Let’s explore by reviewing fixed income in the context of cognitive biases.

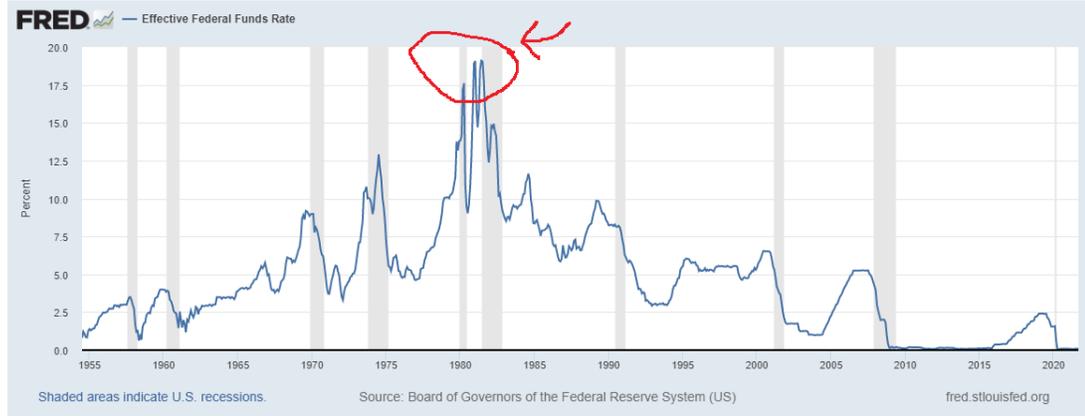
### Fixed Income – A Case Study

On September 30, 1981, an investor could have purchased a 20-year conventional mortgage bond and received 18.75% of yield annually. Nervous about mortgages? No problem. How about a 20-year United States Treasury Bond for 15.78%<sup>4</sup>?

The mortgage offering was half sold. There was tepid demand from retail and institutional investors alike. Banks also sat on their hands.<sup>5</sup>

Whether one looked back to 1950 or 1790, there is no precedent for the super high interest rates of 1981 in the US markets. Within months of the high, as rates quickly dropped below 10% or lower, investors must have been kicking themselves for not getting in. Some undoubtedly waited for rates to hopefully go back up before they’d get in, and therefore never benefited from the historically high annual yield of 10%.

Would I have gotten in on September 30, 1981? Given the benefit of hindsight, of course I would!



### The long history of long (10-year US treasuries) yields



<sup>4</sup> [When Interest Rates Turn the Corner - WSJ](#)

<sup>5</sup> [Effective Federal Funds Rate \(FEDFUNDS\) | FRED | St. Louis Fed \(stlouisfed.org\)](#)



But would I really have gotten in? Given the fact that investors over the previous 5 years had been totally burned, that bonds not held to maturity for the prior 35 years were a bad deal, that stagflation forces participants to spend their money rather than save, and other concerns at the time, I probably wouldn't have.

There are over 188 known cognitive biases. For a complete list in one handy chart (for those with incredible eyesight!): [Every Single Cognitive Bias in One Infographic \(visualcapitalist.com\)](http://visualcapitalist.com). The following subset provides an idea of where we may go wrong:

### Question 2:

A father and son get into a horrible car crash. The father dies and the son is rushed to the hospital. Just as the son is about to go into surgery, the surgeon says, "I can't operate on him - the boy is my son!" How is this possible?

Keep reading to find out the answer!

### Estimates

1. <i>Anchoring</i>	Anchoring estimates to an inappropriate baseline such as guidance or consensus.
2. <i>Confirmation bias</i>	Cherry picking data to support a thesis, rather than objectively analysing.
3. <i>Framing</i>	Interpreting positively-crafted statements positively.
4. <i>More is more fallacy</i>	Adding greater detail makes thesis more persuasive but less likely.
5. <i>Overconfidence</i>	Overriding models and data because we convince ourselves we know better.
6. <i>Availability bias</i>	Judging probability of events by how easy it is to think of examples
7. <i>Substitution</i>	Substituting the question 'Is this stock fairly valued' with 'Do I like this stock.'
8. <i>Halo effect</i>	Assuming all aspects of company positive just because a few stand out.

Model

### Investment decision

1. <i>Herding</i>	Buying when everyone else buys (and/or when share price is rising).
2. <i>Loss aversion</i>	Reluctance to sell losers but willingness to sell winners.
3. <i>Mental accounts</i>	Unwillingness to invest in a good opportunity because you 'missed out already'
4. <i>Status quo bias</i>	Reluctance to change a portfolio despite evidence supporting that change.
5. <i>Overoptimism</i>	Underestimating the risks around a stock you own or recommend.
6. <i>Recency bias</i>	Focusing on recent /upcoming catalysts rather than the long-run thesis
7. <i>Hindsight bias</i>	Assuming you always knew a certain outcome would happen
8. <i>Causal thinking</i>	Assuming a link between a news story and the share price performance that day.

Source: Goldman Sachs Research, Kahneman 'Thinking, fast and slow', Montier 'Behavioural investing: a practitioners guide to applying behavioural finance'.

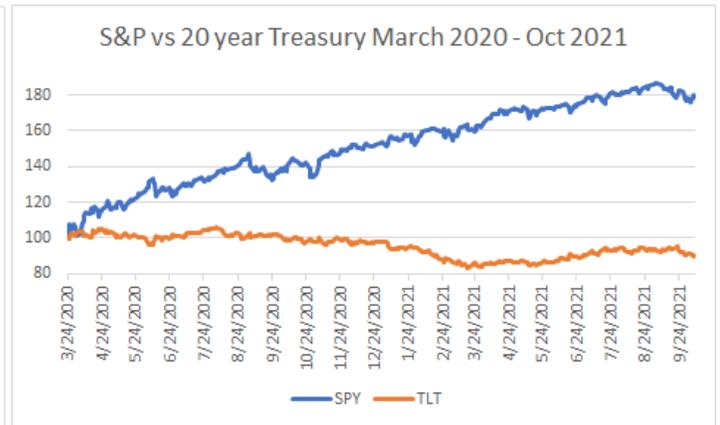
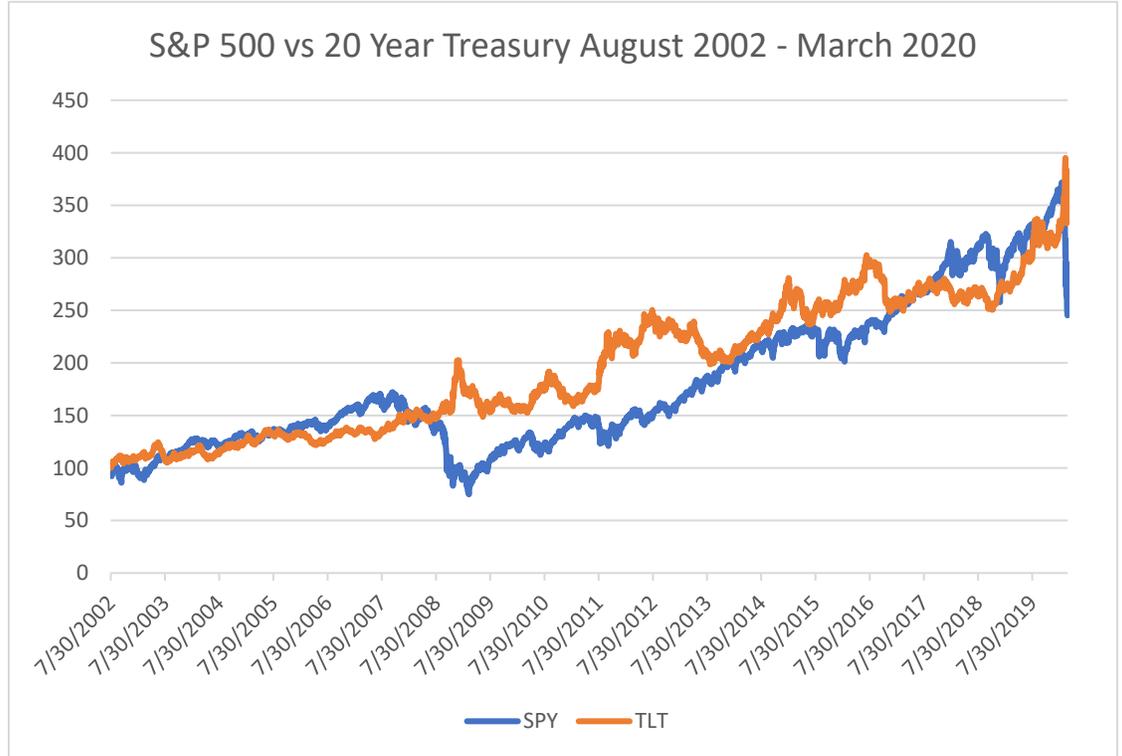




## Cognitive Biases That Get in the Way

A fund with exposure to 20-year US treasuries handily outperformed the S&P 500 over the last 18 years with lower volatility – to the tune of an 8% annualized return for bonds vs 5.25% for the S&P 500 over the same period. When markets dropped in 2008 and 2020, US treasuries increased in value. Investors received both ballast (protection from drops in equity markets and volatility) and return!

Since March 2020, this position has not done as well.



Both charts above are the same. They are just drawn to a different scale. So, what's my goal? Visually, if I am looking to only show slight underperformance, I would use the chart on the left. If I wanted to highlight that underperformance, then I would use the chart on the right.

- Performance Graphs:** Performance graphs paint a simple, straight forward story. When constructing a performance graph, it is important to make it follow an arrow up and to the right. This sounds funny since data is data, so how can one “construct” an up-arrow graph? Well, give me some data and I can fit it to look like that. For example, let’s say a strategy outperformed from 2015 – 2018 but underperformed since. Well then, the “right” graph to show is that of cumulative performance as the initial outperformance will take advantage of compounding of positive returns in shading the underperforming period. However, if 2019 – 2021 was the period of outperformance, then the manager would most



likely not even bother showing performance prior. If it is more complex, just show sample periods where you outperformed. Why?

- We tend to provide way too much weight to an initial view or observation. It is therefore important to give the best first impression possible.
- Biases that make us susceptible to the above:
  - **Anchoring**
  - **Confirmation Bias**
  - **Framing**
- **Narrative:** We all love stories. It is yet another opportunity to create first impressions and focus on what is important for the narrator.
  - We tend to like straight-forward, easy to digest narratives that dwell on positives. Fixed income has a great narrative especially over the last couple of decades as it has provided very strong returns, especially when equities have declined. The headlines here are easy. Bonds have more than followed through on the current narrative for forty years. We simply don't dwell on what happened fifty years ago.
  - Biases that make us susceptible to the above:
    - **Illusion of validity**
    - **Belief Bias**
    - **Clustering Illusion** – This last one conspires with recency bias to make us believe we are looking at deep, complete data sets when in reality, once we zone much further out, it is just a fraction of historical possibilities.
- **The crowd:** It is really hard to go against the crowd. If you are wrong and the crowd is right it is way worse than if both you and the crowd are wrong. If you are right and the crowd is wrong, they may turn on you. The crowd is safe. It is also easy. One does not need to focus quite as much on what exactly is going on.
  - Just about everyone in the industry uses fixed income as a ballast in a diversified portfolio.
  - Biases that make us susceptible to the above:
    - **Bandwagon Effect**
    - **Courtesy Bias**
    - **Status Quo Bias**

Answer 2:

The surgeon is the mother.

The majority aren't typically able to quickly come up with this solution.

Unconscious bias, also called implicit bias, is majorly the reason behind this. People tend to think of the surgeon as a man because people's assumptions are deeply ingrained through social conditioning. This in turn also influences behavior in daily life.

Understanding stereotypes and trying not to make generalized statements will help in considering a more holistic view in our daily lives.

Understanding that biases exist and the nature of the bias itself will help in dealing with one's own bias in an informed and open way.

## Do software algorithms help or hurt?

During the financial crisis I was a director on the global derivative desk of ING, responsible for engineering investment product and hedging those products for all Americas-based (North / South / Canada) exposure requested by the global client base of the bank. We used a sophisticated system that allowed us to plug in variables for those requests that had closed-form expressions (e.g., plugging into Black-Scholes or some other set equation) and allowed us to program and use Monte Carlo simulations for more complex requests where a standard solution was not available.



Programs need inputs. In late 2009, we had a visit from a rather young, very bright trader from one of the major international banks whose book lost roughly \$1 billion during the crisis. What actually occurred was an “impossible” occurrence based on their inputs. The program worked. The data spit out was based on faulty inputs (aka variables). Therefore, they lost a lot of money.

There may be more policing in perceived “bad neighborhoods,” which may result in more arrests for lesser crimes that may be as prevalent in other neighborhoods where there is less policing (think for example marijuana arrests in the 1980s and 1990s). The greater number of arrests reinforces that it is a bad neighborhood. If we simply take that arrest data and stick it into a program, a person who happens to live in that bad neighborhood may have a higher risk score compared to someone who does not. And therefore, if we’re using that program to determine sentences, the sentencing of the person from the bad neighborhood may be biased negatively based on that input.

On a risk adjusted basis<sup>6</sup>, fixed income has generally outperformed equities over the last 40 years<sup>7</sup>. So, risk parity models look great historically. Risk parity is where the model seeks to hold a constant level of volatility (movement), which tends to favor fixed income. But will these models do as well moving forward? Do they consider where yields are now relative to 10 years ago and what likelihood that may play in performance? They could, but most models and algorithms rely primarily, if not completely, on historical inputs. An algorithm relying on these historical inputs may result in subpar performance going forward. Historical data is relatively easy to attain. It is harder to figure out what inputs to use to assist in better understanding where we may go in the future. Also, most historical data does not go back very far, resulting in materially incomplete datasets. Therefore, it is extremely hard to incorporate themes and trends in the world that may be adjusting real time, and that just might result in historical data being fatally off (or in the case of investing, simply resulting in loss).

**What this all means is that by using historical data primarily as an engine to project forward, we are also encompassing human cognitive biases as well as any other societal bias, that may be present in the data. Is it possible to escape this trap?**

Our guest speaker will help us think this through some more on the [upcoming webinar](#) (shameless plug) but for those who will not tune in or watch the recording:

- **Rigorous, consistent process:** While we discussed the potential biases of algorithms, an algorithm is also a consistent, repeatable process that standardizes an approach to some action or analysis. Uniformity of approach allows us to mitigate errors and certain biases while introducing a foundation on which to continuously better a process.
  - If an algorithm is being used, such as an index (which many ETFs use, a subject we broached in the last Exploration), it is important to understand what exactly the algorithm is doing, as well as potential biases (cognitive or other)
- **Frame broadly:** Understanding how different ideas and problem sets interact with others will allow for an increased appreciation of the complexities involved and what may go wrong as compared to an isolated view.
- **Manage risk:** Attempt to understand worst case scenarios. We are inherently overconfident optimists who think bad things happen to others. We fall prey to the classic greed-fear tug of war. Using the process from our first bullet in rigorously reviewing what can go wrong, how we may be able to mitigate that worst case (for example, portfolio

### Question 3:

An individual has been described by a neighbor as follows: “Steve is very shy and withdrawn, invariably helpful but with very little interest in people or in the world of reality. A meek and tidy soul, he has a need for order and structure, and a passion for detail.” Is Steve more likely to be a librarian or a farmer?

Keep reading to find out the answer!

<sup>6</sup> Defined as performance divided by volatility.

<sup>7</sup> This is quite a generalization that applies to constant maturity products which generally define the mutual fund and ETF complex.



diversification) and generally trying to measure future regret may help us stay more balanced in our approaches. This one is really hard, so a process is key.

- **Request advice and opinion:** Receive advice or opinion from a wide range of participants with knowledge of the respective topic. This helps us have a broader perspective on the topic as well as the potential issues that can arise.

We attempt to follow the above guidelines in our own practice. For example, when researching an area of the market, we attempt to speak to all known participants. When we speak to these participants (typically portfolio managers) we are very transparent with them regarding others we are speaking with, namely, their competitors. Why? Well, our industry is mature, very sophisticated, and heavily reliant on marketing. As a result, most stories are woven in a compelling fashion with good associated visuals as highlighted in our “Cognitive Biases That Get in the Way” section. The best market participants to find holes, offer contrarian opinions, and break apart these stories are their competitors. This is because they are also operating in the same space, dealing with similar inputs, and trying to craft their own narrative to support their thesis. We then size our potential investment based on the presumed risk/reward exposure of the investment and how it may fit in the broader investment portfolio we had constructed.

Though perhaps the most important element to understand and to take away from our deep dive on cognitive biases is that they are inherent within us with no true escaping – just mitigating, perhaps and therefore we should be at most modest in the confidence of our choices.

## Investment Initiatives:

**Equity:** As long-term investors, we continue to analyze thematic investment opportunities that may align with the long-term trends and characteristics we observe in markets and in our society. There are several layers that factor into this analysis, ranging from management style (active vs passive) to investment structure (ETF vs mutual fund) to connecting these observations to an investment thesis. For example, how can one take an investment position with respect to aging populations or trade regionalization as compared to globalization?

Valuations are also an important consideration in equity markets. Healthcare technology appears on the surface to have ample opportunity for advancement. But at what cost in valuation terms does the opportunity become unattractive.

In concert with our analysis of thematic opportunities we are working to advance our data sourcing capabilities so we can more robustly evaluate

Answer 3:

Statistically speaking, there is a higher chance Steve is a farmer.

Most people, after given this information, lean towards choosing that Steve is a librarian, illustrating an irrationality in our thinking.

Almost no one thinks to incorporate information about the ratio of farmers to librarians in their judgement. In the US, the ratio is 20:1 (farmers: librarians)

The point is not whether we have complete information and data about the ratio of farmers to librarians, but if people even think to consider that ratio. This is where Bayes’ theorem should be used. The new information should not completely determine your beliefs in a vacuum, rather, it should update prior beliefs.

Similar to the Monty Hall problem where we make several decisions in a day, we fail to incorporate new information into our decision-making process. In the Monty Hall problem, a player tries to guess which of the three doors conceals a prize. Once an initial choice is made, one of the remaining doors is opened revealing no prize. Then, the player is given an option of switching or sticking with the same choice. Most players choose to stick with the same door, but mathematically, it is more logical to switch - it doubles your chances of winning.

Using Bayes’ theorem again helps come to a more logical and better solution. Being rational all the time is almost impossible. However, trying to be rational and making use of as much information and data will help in coming close to a correct or highly probabilistic solution. We shouldn’t be ignoring the new information, nor should we fully take it into account and change our entire prior beliefs. We should be updating our prior beliefs with the new information.



and deconstruct the characteristics of specific sectors and more broad themes, leveraging our contacts in the investment management space to tap into additional resources and expertise.

**Fixed Income:** Fixed Income continues to be a challenging area of the market due to (1) low interest rates and (2) tight credit spreads. Investors are receiving both historically low levels of income in return for lending capital, and the incremental additional income received for lending to riskier borrowers relative to safer ones is also low.

Our focus within fixed income is two-fold right now. First, we are working to index the vast fixed income landscape, and in particular to understand what areas of fixed income may have attractive spreads or a risk/return profile more attractive than traditional investment grade corporate bonds. Second, we continue to monitor opportunities in less liquid investment structures that are able to (1) compensate investors for giving up daily liquidity, and (2) invest in less efficient areas of the market due to lower liquidity requirements. This combination of characteristics provides the opportunity to benefit from a more diversified return profile and to take advantage of structural elements of the investment universe.

**Alternatives:** Last quarter, we adjusted our model portfolios to reallocate traditional high yield fixed income exposure into event driven exposure, which we characterize as defensive oriented alternative exposure. This decision was a result of the fixed income environment noted above, with both low yields and tight credit spreads.

With that defensive oriented adjustment complete, our attention has shifted back to our offensive oriented alternative allocation, particularly MLPs. We have previously held a position in MLPs and are beginning to evaluate the positioning and outlook of MLPs in the current market environment.

We continue to monitor markets closely and look for opportunity on your behalf from both a risk mitigation and return perspective.

## **General Market Review: Inflation – Transitory or Structural + The Interest Rate Conundrum**

In the context of the historical levels of risk-free yields, we have been concerned with how low current yields are. This is a concern we've had for a while now. Given how low yields are and our belief that yields cannot go meaningfully below 0% and still attract investors (lenders), we continue to remain concerned about the actual "ballast" – meaning protection – that a traditional fixed income strategy may provide in a bear equity market. Further, we are also concerned with the returns one may reasonably expect in a normal market environment. Over the last 40 years, holders of fixed income strategies would receive a yield plus an increase of value associated with a declining yield curve. Yields are currently anemic on an absolute and a historical basis and it is hard to see much room for declining yields.

Not only are yields historically low but so are the spreads above yield for riskier yield-producing assets. "Spread" is the premium a market must pay for the additional risk taken. For example, a high yield bond (aka junk bond) may need to provide a 4% annual yield as compared to a US government (aka risk-free) bond's 1% annual yield.

Introduce an element of inflation and it materially complicates the narrative. Inflation is created by some combination of scarcity and demand. Increasing interest rates is a way to dampen inflation. While there are elements of current inflationary measurements that seem transitory, such as supply chain issues due to Covid, there are other elements that are not as clear or outright structural such as the initial cash infusion provided by our government during the deflationary period when we essentially closed our economy in an attempt to protect the population. The current data on jobs is one that is really complex and frankly confusing to us. Just some points on the matter:

- There are currently 10 million job openings in the country – a record<sup>8</sup>.

<sup>8</sup> We spoke about jobs in our most recent Market Commentary: [Market-Commentary-2021.8-1.pdf \(fountainheadam.com\)](#)



- But the participation rate is still near 50-year lows and is roughly 1.5% below levels immediately prior to Covid. If the participation rate were at the same level as prior to Covid then the job opening rate would be within the average over the preceding ten years.
- Government assistance has muddied the story: How many market participants are sitting on the sidelines due to government assistance for a variety of reasons? And when will these participants come back and perhaps bring everything back into balance?
- Due to current market demand, wages have clearly gone up, primarily in the bottom quartile of wage earners<sup>9</sup>. Will they go up more? Can they possibly decline?
- However, there are longer term dampeners on inflation such as worsening demographics and low productivity. These are the reasons that interest rates have remained so low for so long in the first place! The Fed has been fighting deflation, not inflation!

Ultimately, and more due to our first conclusion that interest rates are historically low and spreads are historically low, we believe the risk / reward opportunity in fixed income – especially in longer maturity products – are skewed against us.

We have therefore implemented two biases into our portfolios, the second one executed this past quarter:

- Our portfolios have a materially shorter duration than our benchmark which is an index reflecting primarily reflecting all global investment grade and government issued bonds. If you own a bond with a 10-year maturity and the interest rate demanded for that bond increases by 1%, your bond will decline in value by roughly 10% (and vice versa, e.g., a 1% yield decline = ~ 10% gain in value). We are seeking to still provide a level of ballast to the portfolio but with less volatility due to large yield moves as we attempt to mitigate losses from an increase in yield.
- We have sold almost all of our high yield investments due to the tight spreads and moved that exposure to merger arbitrage strategies<sup>10</sup>. We believe that these strategies have the opportunity to capture similar returns but without the current risks of high yield (low historical yields coupled with low spread). Of course, merger arbitrage strategies also have risks. We simply believe they currently have a more typical current risk / reward profile from a historical perspective when compared to high yield.

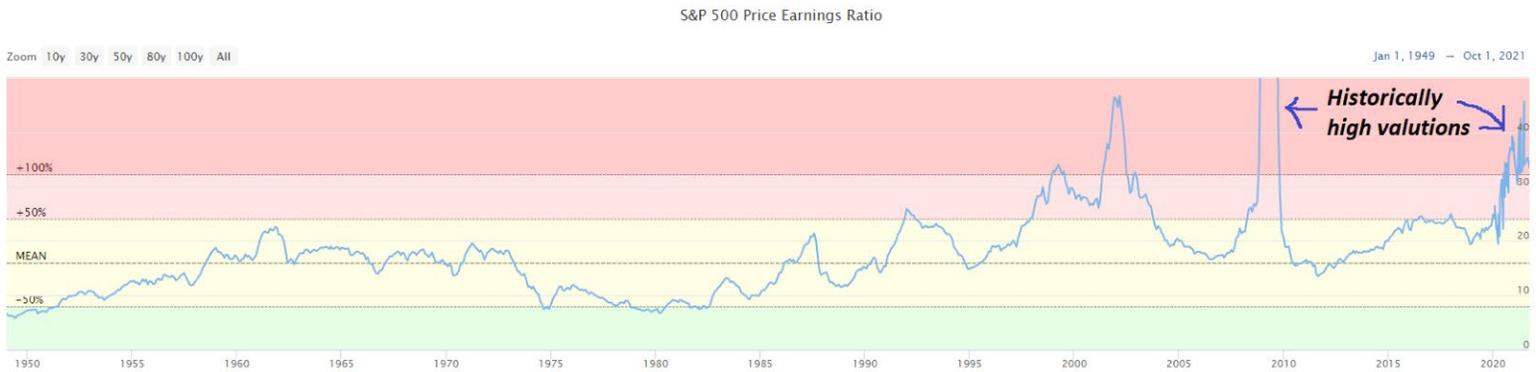
The tail end of Q3 proved to be volatile as a number of concerns drove markets lower:

- Inflation concerns
  - Well identified supply chain disruptions continue to foster a mismatch between supply and demand in many corners of the market.
  - Labor and participation shortages in certain industries are further pressuring already fragile supply chains and contributing to an increased inflation concern.
- Valuation concerns
  - The chart below shows that while valuations have come down slightly over the last quarter, these levels continue to sit near historical highs.

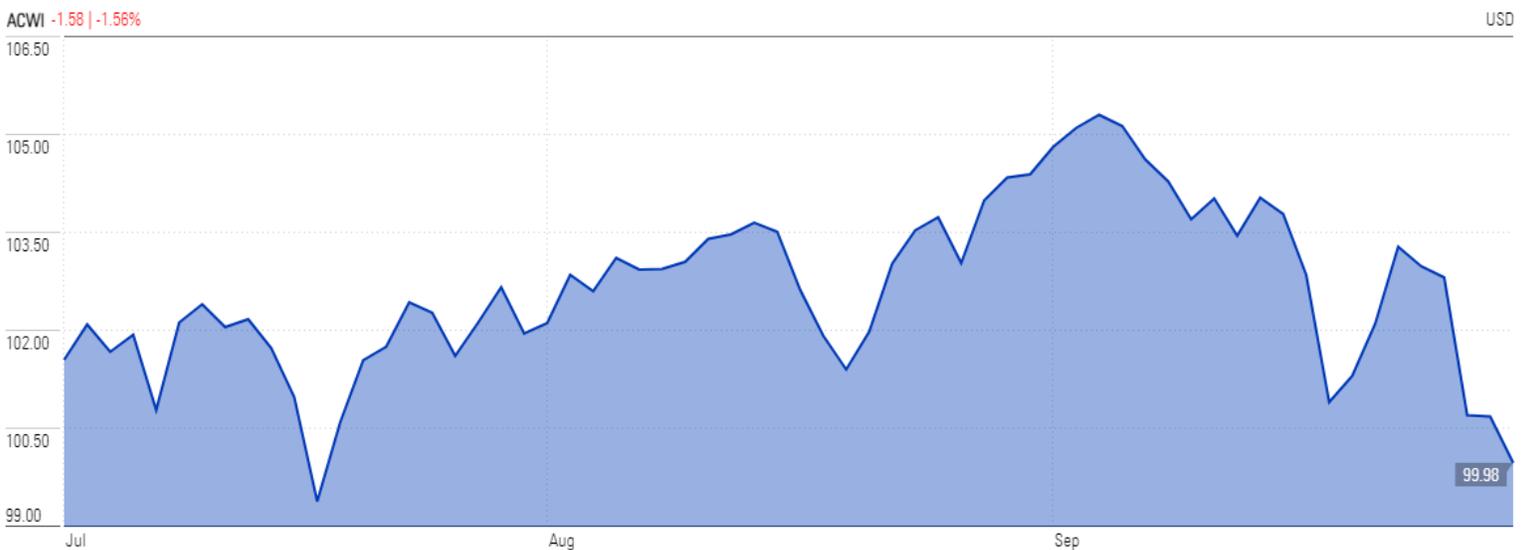
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<sup>9</sup> Natixis puts out fabulous research generally – one we have leaned on here is their Labor Market Tracker. A benefit of our firm is that we can tap into research from just about all asset managers.

<sup>10</sup> For example, company A announced the acquisition of company B. Until the acquisition closes, there is risk that it will not go through. For that risk, there is a premium provided by purchasing company B and selling company A. A risk arbitrage strategy would seek to take advantage of this premium.



Due to these concerns, global equity markets dropped roughly 5% in September, resulting in slightly negative performance (-1.58%) for the quarter:

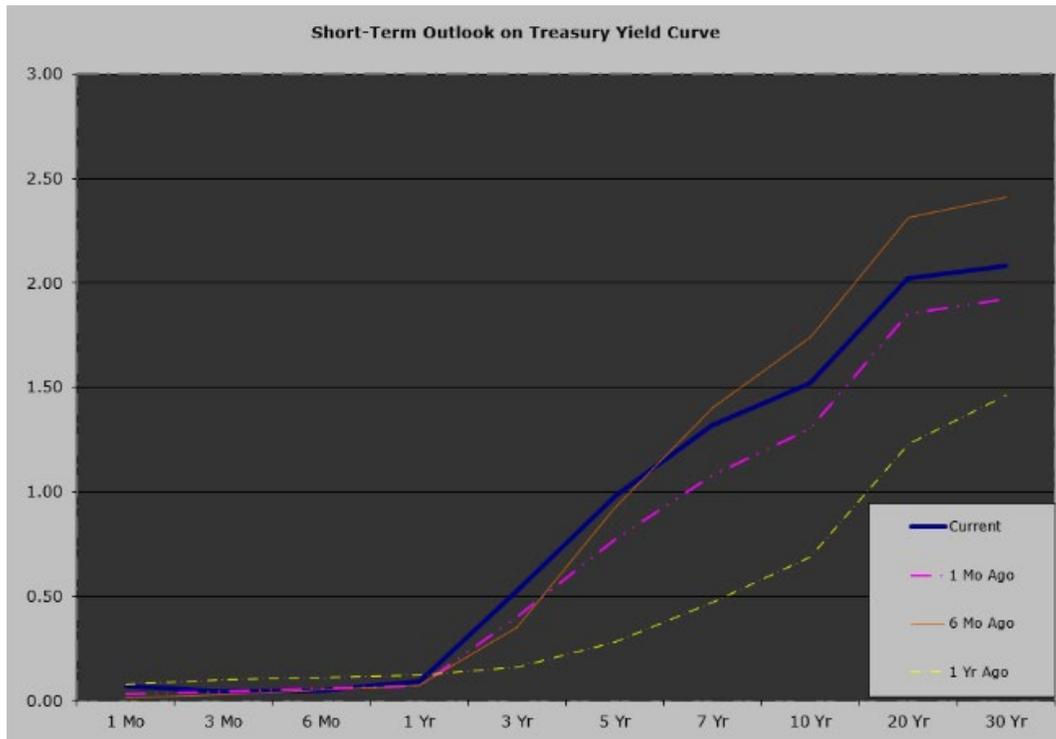


The graph on the following page shows how yield curves have moved over the last year in reaction to both an economy that is opening, which should result in higher yields (for good reasons!) and inflation concerns that also should result in higher yields (but for bad reasons!).

The yellow dotted line shows where yield curves were a year ago – prior to a vaccine being available and with many measures to protect the population in place which also had negative economic consequences.

The yield curve steepened six months ago (brown line) in expectations for a quick recovery. But dropped a bit off these levels due to Delta Variant concern off those levels before increasing once again as the market attempted to digest and analyze inflation data (pink dotted line).

These are big moves for interest rates, and this illustrates the complexity of the times as we are still recovering from the disruption Covid had wrought on the global economy.



A laundry list of items to tend to in Washington may also contribute to further near-term volatility:

- Debt ceiling negotiations among our political parties
- The infrastructure bill
- Potential tax increases

Suffice it to say, financial markets are and will always be incredibly complex. We continue to monitor markets closely and look for opportunity on your behalf from both a risk mitigation and return perspective.

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