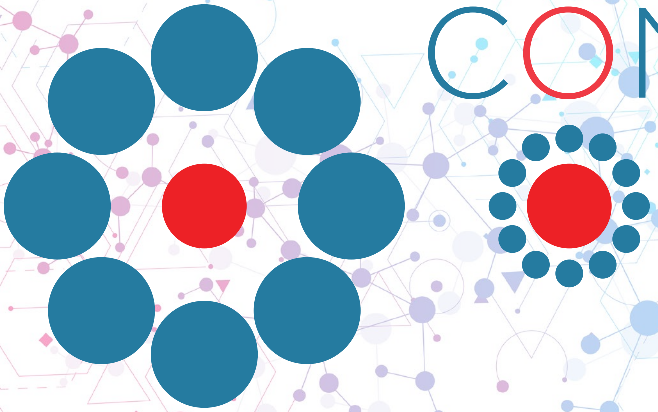

CONNECTING THE DOTS

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Our minds really do play tricks on us - the red dots are actually the same size. The irrational way the human brain processes data spurred the development of Behavioral Decision Theory (BDT), the academic discipline that applies psychology to decision making. BDT challenges the long-held assumption in economics and finance that people act in their rational self-interest, and has been gaining acceptance in the investment community as it helps explain many of the market's anomalies. This issue of *Global Foresight* focuses on some of the key behavioral issues in investing and how we see them applying to current equity opportunities. With interest rates recently plunging again, our Head of Fixed Income Mark Iannarelli examines the hotly debated topic of Modern Monetary Theory which has many notable critics and advocates.

Director Steven Spielberg rose to stardom in 1975 at the young age of 28 when his movie Jaws set box-office records creating the summer action blockbuster genre. Ever since Jaws (and its three sequels), many beach-goers have had an irrational fear of sharks. This should be no surprise as most of us are inherently poor judges of risk, especially when it relates to outcomes that are easy to visualize.

While the notion is hardly new that our minds do not process data in a consistent fashion, academia only began applying this concept to economics about 45 years ago. Amos Tversky and Daniel Kahneman are credited as the pioneers of Behavioral Decision Theory (BDT) with their 1974 paper "Judgment and Uncertainty: Heuristics and Biases." However, it took years for this new field to overcome skeptics and gain acceptance amongst mainstream economists, punctuated by Nobel Prizes awarded to Daniel Kahneman in 2002 and Richard Thaler in 2017. While there are many textbooks devoted to the subject, some concepts have had a greater impact on investing than others.

RECENCY BIAS

Arguably the most widely recognized investment bias is the recency bias, which is the tendency to place too much emphasis on recent data. As an example, almost every day there is a new torrent of economic data, which tends to have an outsized impact on stock market movements (especially considering the variability of much of the data). We see recency bias especially pronounced with consumer confidence indices, as sentiment indicators typically do a wonderful job of predicting the past and a poor job of predicting the future. These indicators are unreliable forecasting tools because sentiment is inherently vulnerable to recency bias. Moods tend to shift far more rapidly and frequently than does the underlying health of the economy.

Economics Nobel laureate Paul Samuelson famously said "the stock market has predicted nine of the last five recessions," illustrating how the market is far more volatile than changes in economic activity that underpin corporate profits. One could argue that recency bias causes these exaggerated swings in stock prices as investors place too much weight on near-term data. The fourth quarter of 2018 provided an excellent example of Samuelson's quote, with a correction that was well in excess of what economic fundamentals, interest rates and valuations would suggest to be fair value for markets.

Recency bias can be especially pronounced at the single company stock level. Consider anytime a stock merger or takeover is announced. Typically the smaller companies in the same sector get a quick short-term boost as investors become overconfident about the odds of more deals taking place. In reality, the odds of more takeovers likely have not shifted nearly as much as investors perceive.

Casinos years ago mastered the psychology of creating recency bias. The exaggerated bells and whistles of slot machines are designed to generate excitement and create the sense that people are winning and that you should be playing. In reality, the casino is winning and your wisest bet is to ignore the clanging of slot machines and head for the exits. In a similar way, splashy headlines create a heightened sense of euphoria that tempts many investors. These sensational headlines would include mergers, new product launches, and announcements of technology breakthroughs all of which typically generate a temporary surge of investor enthusiasm. The old adage "sell the news" is just an interpretation of recency bias.

AVAILABILITY BIAS

The availability bias is one of the easiest to understand and relate to investing. It occurs when we overestimate the likelihood of an event because of the vividness with which examples come to mind. Our irrational fear of shark attacks provides a useful illustration. While fatalities are exceedingly rare, less than one per year according to the Centers for Disease Control and Prevention (CDC), shark attacks are certain to be covered in traditional media and rapidly spread on social media, exaggerating the perceived risk. The CDC estimates roughly 3500 people lose their lives to drowning each year, including 400 in swimming pools and 85 to 90 in bathtubs. Drownings do not make national headlines, shark attacks do - most of us have little understanding of the relative risks between the two.

We can draw an important parallel from shark attacks to other rare events that trigger availability bias and weigh disproportionately on investor psychology. One that easily comes to mind is airplane fatalities. Commercial airlines are an extraordinarily safe means of travel – the odds of perishing on an airplane rank lower than getting killed by a dog or bee stings. But crashes are sure to gather intense media coverage as we saw with the recent tragic Air Ethiopia accident.

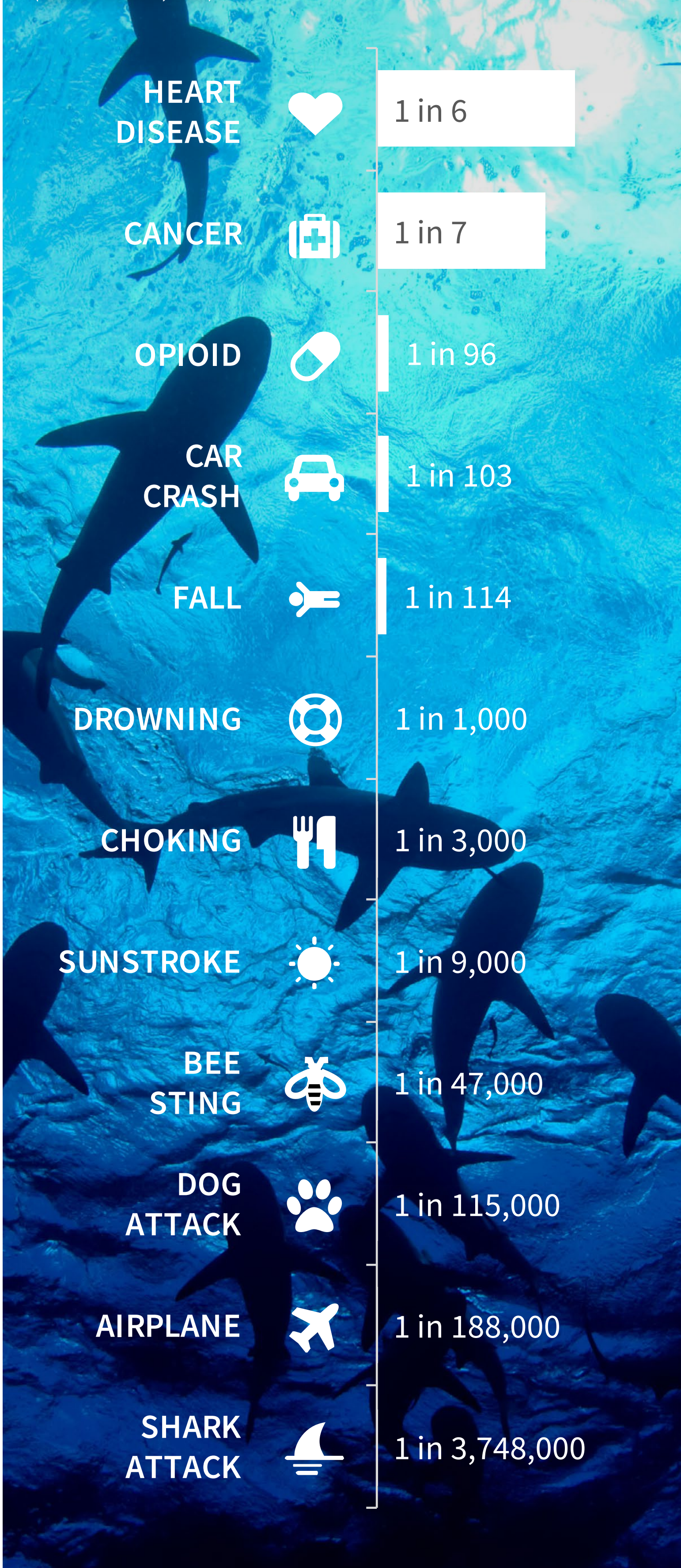
Headline risk is something investors naturally seek to avoid as it typically coincides with a pronounced share price decline. Headline risk can feed recency and availability biases as we saw with Boeing in March in the wake of the grounding of their 737 Max airplanes. As much as we can try to minimize the likelihood of adverse headlines in portfolio holdings, negative events happen in every industry. Investors cannot totally avoid headline risk. Instead they should have a consistent process for rational decision making, which will be invaluable when inevitable bad news occurs. We have found adverse headlines have provided opportunities both on adding to existing investments as well as entry points for new investments. To capitalize on cognitive biases, a disciplined process forces a rational analysis of opportunities during periods of maximum short-term stress as well as peak euphoria.

GAMBLER'S FALLACY

The gambler's fallacy is the mistaken belief that if an event happens more frequently than normal, it will happen less frequently in the future "to even things out." If a coin flips heads five times in a row, gambler's fallacy suggests most people will predict tails on the next flip "because it's due." However, the odds are still 50-50 that the next flip will be tails despite the recent streak of heads.

In terms of investing, the gambler's fallacy has probably led to many feeble attempts at market timing and guessing economic cycles. To be clear, markets and economies are different than coins in that odds do change based on fundamentals. But investors too often

EXHIBIT 1:
LIFETIME ODDS OF DEATH FOR SELECTED CAUSES
(UNITED STATES, 2017)



Source: National Center for Health Statistics; National Safety Council.

fall into the gambler's fallacy trap looking for streaks that they expect will revert to the mean. Think of the investors who exited the market in 2010 after the massive recovery in 2009.

A similar comparison can be applied to the U.S. economic cycle. "The U.S. economy is overdue for a recession after 10 years of growth." Recession odds should not be a function of the period of time since the last recession, but based on a variety of economic factors. By comparison, Australia has not had a recession since 1991 while the European Union contracted in 2009, 2012 and 2013. There are many reasons to be concerned about the sustainability of U.S. economic growth – including aging demographics and budget deficits – but the length of the current expansion should not be near the top of the list.

CONFIRMATION BIAS

Another well-documented bias is the "confirmation bias." People tend to search for views that reinforce our own opinions. As it applies to investing, many seek opinions from analysts who share similar directional views on stocks when they would be better served searching for disconfirming evidence. Investors are likely to learn far more from the most bearish analyst whose views on a stock differ sharply from consensus.

"You must force yourself to consider opposing arguments. Especially when they challenge your best loved ideas."

- Charlie Munger

CONTEXT MATTERS

One unifying theme of behavioral economics is the importance of context for making consistent, rational decisions. In the book *Nudge: Impairing Decisions About Health, Wealth, and Happiness*, Richard Thaler and Cass Sunstein illustrate how people can be greatly influenced by the way in which choices are presented to us. As an example, New York City taxis provide three default options for tipping: 20%, 25% or 30%. While you can always choose your own tip, most people will be swayed by the default options presented to tip more than they would if the choices presented were 10%, 15% or 20%. The context in which we make decisions can have a lot of bearing on the quality of those decisions. That context can be easily blurred in an environment when we are bombarded by news, data and images from traditional and social media that lead to suboptimal decision making.

A more visual example of how context can drive us to the wrong conclusions is the famous Café Wall Illusion shown in Exhibit 3. The horizontal lines appear to be drawn at an angle, but are in fact straight and parallel. As a lesson, beware of how incorrect scaling on charts and cherry-picking time periods can present a very different view of how the market, economy or a stock is performing.

MARKET OUTLOOK

The dot illusion on the cover is from 19th century German Psychologist Hermann Ebbinghaus who was better known for creating the concept of the "learning curve." Behavioral concepts can be learned fairly quickly. Applying them in a consistent fashion to improve investment decision making is more of a challenge as we tend to revert to our biases.

These biases were especially evident in the last six months in the markets. The fourth quarter of 2018 was dominated by fear of a trade war with China, concerns about the U.S. Federal Reserve being too hawkish, and fear of a recession in the U.S. Investors were seemingly glued to the spread between 2 and 10 year bonds since that has been a harbinger of recession when it turns negative.

The market's swift rebound in the first quarter had a lot to do with the better tone coming out of U.S. negotiations with China and dovishness from the Fed. Investors seem to be less concerned with the 2-10 spread, yet it has continued

EXHIBIT 2: **FATAL AIRLINER ACCIDENTS PER 1 MILLION FLIGHTS**

Source: Aviation Safety Network

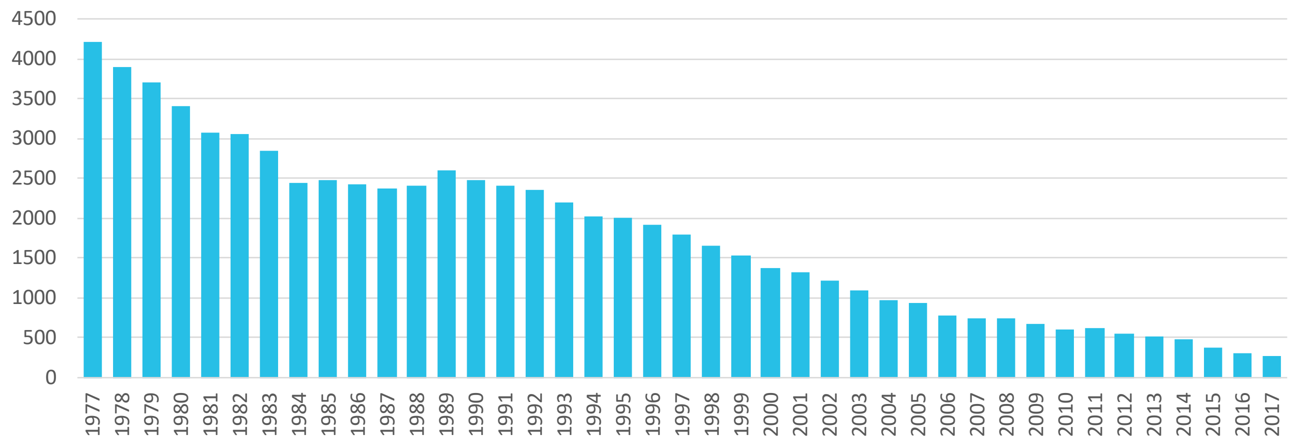
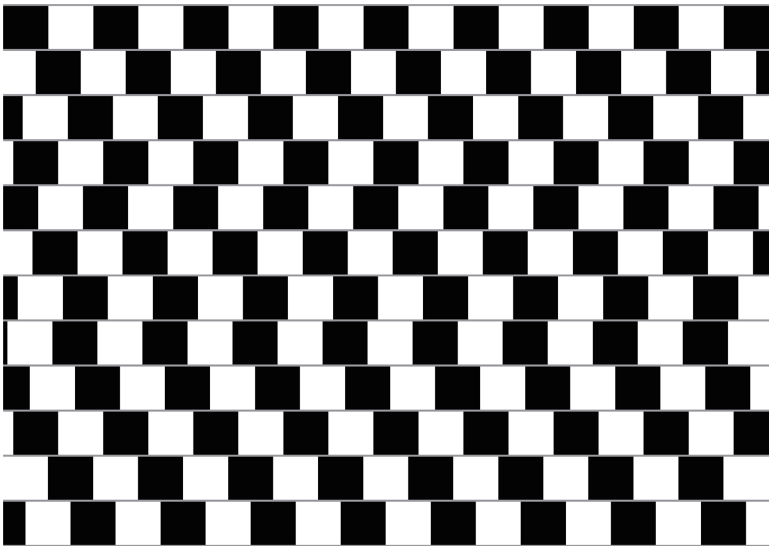


EXHIBIT 3: **THE CAFÉ WALL ILLUSION**



The café wall illusion is a geometrical-optical illusion in which the **parallel straight dividing lines** between staggered rows with alternating black and white "bricks" **appear to be sloped**.

to grind lower. The New York Fed's model which is based on the slope of the yield curve (last updated on February 28) placed odds of recession within the next twelve months at 24.62%. By comparison this same model was at 14.12% at the end of last October in the middle of the major market correction and only 4.17% last February during a smaller market correction. Economic data have trended softer in the U.S., China, Japan and Europe while earnings estimates have been trending modestly lower.

In many ways the market action in the first quarter was the mirror image of the fourth quarter when equities sold off despite decent earnings and good economic growth. Three months ago we pointed out how inexpensive the market was, especially outside of consumer staples and utilities. However, the big rally in equities coupled with earnings reports that have been slightly lower than expected have nudged market valuations much closer to neutral territory. Contrary to the flattening of the yield curve, we have seen credit spreads stay reasonably tight, usually a positive indicator for the economy, as credit spreads widen when economic fears mount.

As with the Café Wall Illustration above, the data from the yield curve and credit spreads seem to clash. If investors are merely chasing yield everywhere then it makes sense that the yield curve is flattening while at the same time spreads are staying tight. We have seen evidence of chasing yield in utilities which have continued to soar, reflecting ever-lower yields available in corporate bonds. In an environment where investors are chasing return, typically we would suggest reducing portfolio risk to at least a neutral stance. While recession is still not probable, its risk has risen over the last few months. A potential trade deal with China seems well-telegraphed and built into stock prices like most "sell the news" type of events.

CONCLUSION

There are multiple biases that impact investment decisions, and hindsight bias explains why most will seem obvious after the fact. This is especially relevant for economic and market cycles which always seem more obvious in hindsight than they are in foresight. With concerns mounting about the length and sustainability of the current U.S. economic cycle, it is important to remember that economic expansions do not necessarily die of old age. However, economic growth is being impacted by aging demographics. We believe growth expectations should be modest in the U.S., and we are ever-more vigilant for potential signs of a recession. Economic growth expectations are already very low in Europe leaving some room for positive surprise. We continue to believe the United Kingdom will not leave the European Union without a deal, but their inability to get this solved has not been helpful for their economy.

Behavioral decision theory has important concepts that can be applied to investing. Euphoria from positive news is rarely sustained, likewise bad news often quickly becomes yesterday's story. While we are pleased to see markets recover from the sharp correction during the fourth quarter of 2018, we have seen continued softness in economic data. We believe this justifies taking a more neutral stance towards risk than we advised in the January issue of Global Foresight, where we cited valuations across many sectors that were just too low. However with a price-to-earnings ratio of 16.8x current expected 2019 earnings on the S&P 500 Index (and even lower valuations overseas), markets do not yet seem expensive. Relative to today's low inflation and interest rates, we would have to become incrementally more cautious on economic prospects to change our view on equities from neutral to negative.

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