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The Mind and Mispricing

One of the few certainties in investing is the ubiquitous presence of uncertainty. As an investment manager, it is our business to deal with uncertainties as well as the attendant opportunities and risks that uncertain situations present. At Sionna, we spend a lot of time thinking about the behavioural dynamics that can drive mispricing in the market and how uncertainty plays a role. The book *Thinking, Fast and Slow* by Daniel Kahneman is a treasure trove of information regarding the fallibility of human cognition and offers some insight on the topic. Two psychological foibles discussed in the book are especially relevant to the market today: the possibility effect and the certainty effect.

The table below is derived from data included in *Thinking, Fast and Slow* based on studies conducted by the author and provides a strong demonstration of both of these psychological shortcomings. It illustrates the value individuals ascribe to bets with varying probabilities of payoff. One can think about the figures as follows, the probability line outlines the odds of winning $100, while the decision weight is the value individuals ascribe to that bet. As an example, when presented with a situation where there is a 0% probability of winning $100, people ascribe a value of $0 to that bet. Conversely, for a 100% chance of winning $100, the ascribed value is $100. These results are perfectly logical.

Probability	0%	2%	5%	20%	50%	80%	95%	98%	100%
Decision Weight	0	8.1	13.2	26.1	42.1	60.1	79.3	87.1	100

Source: Kahneman, D. (2011). Thinking, fast and slow. [Toronto]: Doubleday Canada.

Possibility Effect

The rest of the table does not appear as intuitive. Certainly, what jumps out is the value people ascribe to gambles with a low probability of payoff. The table above demonstrates on average individuals ascribe a value of ~$8 to a gamble with a 2% probability of paying out $100. Based purely on expected value, one should not be willing to pay more than $2 for this gamble. This willingness to overpay for a small chance of winning a large payoff is the possibility effect in action. This dynamic helps to explain why lottery tickets are so popular despite the well-known negative expected value of buying them – it's human nature.

The possibility effect may also help describe some of the behaviour we have seen in the market in recent months. Many high-flying technology stocks have seen their valuations expand rapidly over the past six months. Some of these companies that have seen their market capitalization swell to a massive size have yet to show a level of profitability commensurate with their valuation, or any profit at all in many cases. Instead, their valuations are justified based on the potential for their revenues and profits to expand massively in the years ahead. There is no doubt that some of these businesses will make good on the growth expectations embedded in their current valuations. However, in our opinion, the odds that most of the richly valued enterprises out there will make good on their embedded growth expectations are much more questionable.

The possibility effect would give us reason to believe that investors could be overpaying for many of these current market darlings. In our view, while the odds of these stocks making good on their embedded growth expectations are low, the potential value of their businesses if such bullish assumptions materialize is enormous. These are, in effect, "lottery ticket stocks". In the short term, the strong performance of some high-flying technology stocks has hurt the relative performance of our value style. Over the long term, we believe the shares of a business should trade at a level reflective of the underlying value of the business's profit stream. From our

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perspective, this means some of these high-flying stocks could have unacceptable downside risk. The potential downside in these names could be substantial if they fail to meet the market's future growth assumptions. Understanding the irrational behaviours that can drive discrepancies between price and value in the short term gives us confidence that sticking to our value strategy will pay off in the fullness of time.

Certainty Effect

On the other end of the spectrum is the certainty effect. This dynamic can be seen on the rightmost side of the previous table where introducing even the slightest bit of uncertainty into an otherwise certain gamble causes excessive discounting. The table shows that on average individuals ascribe a value of ~$87 to a gamble with a 98% probability of paying out $100. Based purely on expected value, one should be willing to pay $98 for this gamble. However, the introduction of a small amount of uncertainty results in excessive discounting. In the case of the possibility effect, people become overly fixated on the small chance of a large payoff and end up overpaying. In the case of the certainty effect, people fixate on the small probability of losing the bet and are unwilling to pay a fair price for the gamble.

Exploiting the certainty effect is a core element of Sionna's value investing process. We focus our research on finding businesses with a history of robust financial performance and strong competitive positions. Whenever events transpire that make the future trajectory of such businesses more uncertain, we step in once we feel that share prices no longer reflect long-term fundamentals. In many cases, strong businesses are able to weather through short-term issues. In the short term, however, the market often fixates on the present risks and undervalues the odds that a company will be able to manage through its current troubles. This is a great example of the certainty effect. By investing in names at moments of excess pessimism, we benefit as businesses work through their issues and the uncertainty surrounding their earnings power dissipates. Often it takes time for businesses to work through their issues, which is why it is important to have patience and a long-term investment horizon.

The presence of the certainty effect provides us with reason to believe that value should continue to work in the long term. So long as markets are driven by the decisions of people, movements in asset prices will to some extent reflect the imperfections present in human cognition. The past few years has been a very trying period for value investors and has certainly been testing the patience of many. At Sionna, we don't believe people have radically evolved over the past decade. As such, the cognitive foibles that have led to mispricing in the past, should continue to be a source of opportunity into the future. This is one reason why we continue to believe that a disciplined value investing approach should deliver attractive risk-adjusted returns to clients over the long term.

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