# Encouraging Long-Term Thinking by Organizations Making Investment Decisions

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# Part I. Behavioural Context

## Our Partner, and the Research Problem

The overarching problem statement that this paper addresses is as follows: ***How might different ways of communicating about risk measurements between risk teams and the Board of Directors help financial institutions commit to long-term investments***?

FCLTGlobal is a not-for-profit organization focused on fostering long-term thinking within business and investment decisions through the development of practical tools and approaches that encourage long-term behaviours across the investment value chain. As a part of a partnership between BEAR and FCLTGlobal that tries to address the question of why organizations are short-term in their thinking and how this tendency can be attenuated, we analysed potential behavioural interventions that can be applied during trustee meetings to shift communication patterns between senior risk teams and the Board of Directors.

Our problem statement can be broken into several key components such that it allows us to apply a behavioural lens to each. These components are a) the effects of time on decision-making, b) the visualization of information and its effects on decision-making, and c) contextual factors pertaining to our two key stakeholders (risk managers and Board of Directors).

In terms of time, FCLTGlobal defines a long-term investment strategy as a strategy that encapsulates a time frame of ***at least*** six to seven years. There is historical evidence supporting the idea that long-term thinking could ultimately yield greater returns. (Benartzi & Thaler, 1995). In fact, it has been proven that investments of all-stock (riskier) portfolios, rather than all-bond portfolios, perform significantly better in the long term (Benartzi & Thaler, 1995). Moreover, over a 40-year period, Benartzi and Thaler (1995) discovered that there was not a single case in which the all-bond portfolio outperformed its riskier counterpart—this insight has often been referred to as the *Equity Premium Puzzle*. Yet amongst financial investments, myopia (the tendency for short-term thinking) often rules supreme within the corporate world (Jackson & Petraki, 2010).

Currently, the investment and risk values that are being presented at these trustee meetings are often in the form of tables and raw numbers, rather than easily digestible formats (for example, graphs). Moreover, the statistics presented often contain underlying assumptions about the time horizon or the market volatility that are embedded within them (Ambrosio, 2007). Considering that most Board of Directors and risk managers have different company mandates and differing levels of understanding of financial metrics, the fact that the metrics themselves contain certain assumptions can create complications for fostering conversations about long-term investment decisions. Moreover, Appendices A and B, along with Part 2 of this paper, dive deeper into the context within which the Board of Directors interacts with the risk team and ultimately make their investment decisions, often falling prey to short-termism (note: short-termism is terminology

used by Jackson & Petraki (2010). As behavioural scientists, we prefer the term “myopia” but will also use the terms short-termism and long-termism to relate to the literature.

## The Need for a Behavioural Approach

Contrary to classical theories about financial investment and risk that posit that stakeholders evaluate risk through a consequentialist, rational, utility-maximizing mindset, new studies have emerged suggesting that agents’ decisions around risk are best explained through their subjective understandings of the concept. In other words, while classic perspectives think about risk as a mathematical construct determined by probabilities and outcomes, newer approaches have also begun to embrace the notion that risk taking can be described as a feeling driven by emotion; and that both the numerical and emotional approaches to risk could drive decision making (Gentile, Linciano, Lucarelli, & Soccorso, 2015; Loewenstein, Weber, Hsee, & Welch, 2001; Lucarelli, Uberti, Brighetti, & Maggi, 2015; Weber, Siebenmorgen, & Weber, 2005). This affective response is often referred to as the risk-as-feelings approach (Gentile et al., 2015; Loewenstein et al., 2001). Through a comprehensive review of previous academic research regarding the intricate ties between emotions and people’s perceptions of risk, Lowenstein et al. (2001) showed – across multiple domains - that people experience an emotional response to risk and thus make decisions by incorporating their feelings. This finding can be especially consequential in circumstances with larger degrees of uncertainty (Gentile et al., 2015). The relevance of the risk-as-feelings framework to a financial investment context was reaffirmed by Lucarelli et al. (2015). These authors conducted a controlled experiment whereby subjects had to build a financial portfolio, and found that participants had an emotional response to the risk of a loss/negative returns, which affected their decision making.

The risk-as-feelings framework is useful insofar as it states that people do not think about risk in terms of expected utility and payoffs, and hence extends our understanding of how managers might react to risky prospects. Thus, this paper further explores the behavioural factors potentially affecting risk managers’ and the Board of Directors’ perceptions of risk. Based on the literature that we have reviewed, the behavioural factors that are pertinent to the overall project are perceived complexity, loss aversion (prospect theory), myopic loss aversion, and biases resulting from the recognition heuristics. These are depicted further in the decision maps in Appendices A and B.

## Myopic Loss Aversion

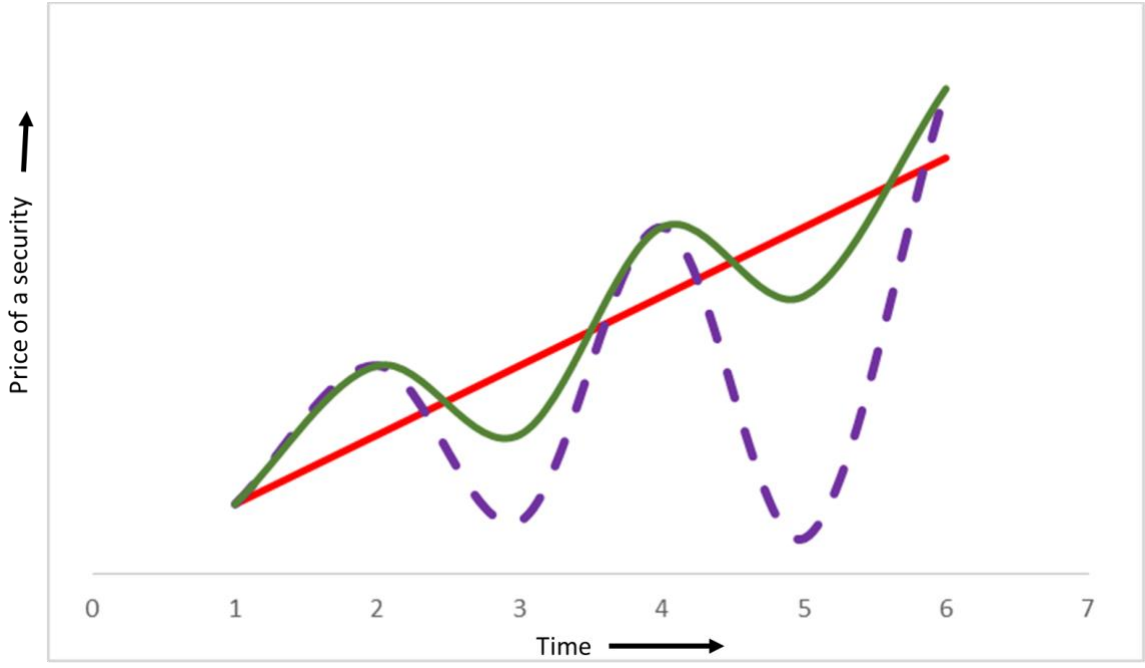
Perhaps one of the most cited and central theories in the field of behavioral economics is prospect theory (Kahneman & Tversky 1979; see also Benartzi & Thaler, 1995; Dierkes, Erner, & Zeisberger, 2010; Gneezy & Potters, 1997; Soman, 2015 for various applications). One particular phenomenon that has been developed and studied extensively from a prospect theory perspective is myopic loss aversion. This phenomenon arises from the combination of two

particular parts of prospect theory—mental accounting and loss aversion (Gneezy & Potters, 1997). Gneezy and Potters (1997) found that because of myopic loss aversion, “a longer evaluation period makes a risky option with positive expected returns looks more attractive” (Gneezy & Potters, 1997, pp. 640–641). Moreover, Wallmeier (2010) defined myopic loss aversion as “the aversion to short-term losses when the investment horizon is long-term” (p. 316).

Myopic loss aversion can best be illustrated through a simple example as illustrated in Figure 1 below. The green curve in the figure represents the price of a given security over time, while the red line represents the trend line that captures the same security over time. The red line is, in essence, the regression line that eliminated temporary “errors” – deviations from the trend. In particular, the total area between the green curve and the red line is zero; or – there is as much area of deviation above the red line as there is below the red line.

However, one of the central tenets of prospect theory is the idea of loss aversion – that the psychological impact of a unit loss is significantly greater that the psychological impact of a unit gain. Indeed, several estimates suggest that losses hurt people about 2.25 times as much as gains make them happy (see Barberis 2013). As a result, the purple dotted curve in Figure 1, which gives losses (negative deviations from the red line) a greater weight, captures the effective (psychological) price of the same security. As is visually apparent, the area under the red line is now greater than the area above the red line.

Figure 1. An Illustration of Myopic Loss Aversion



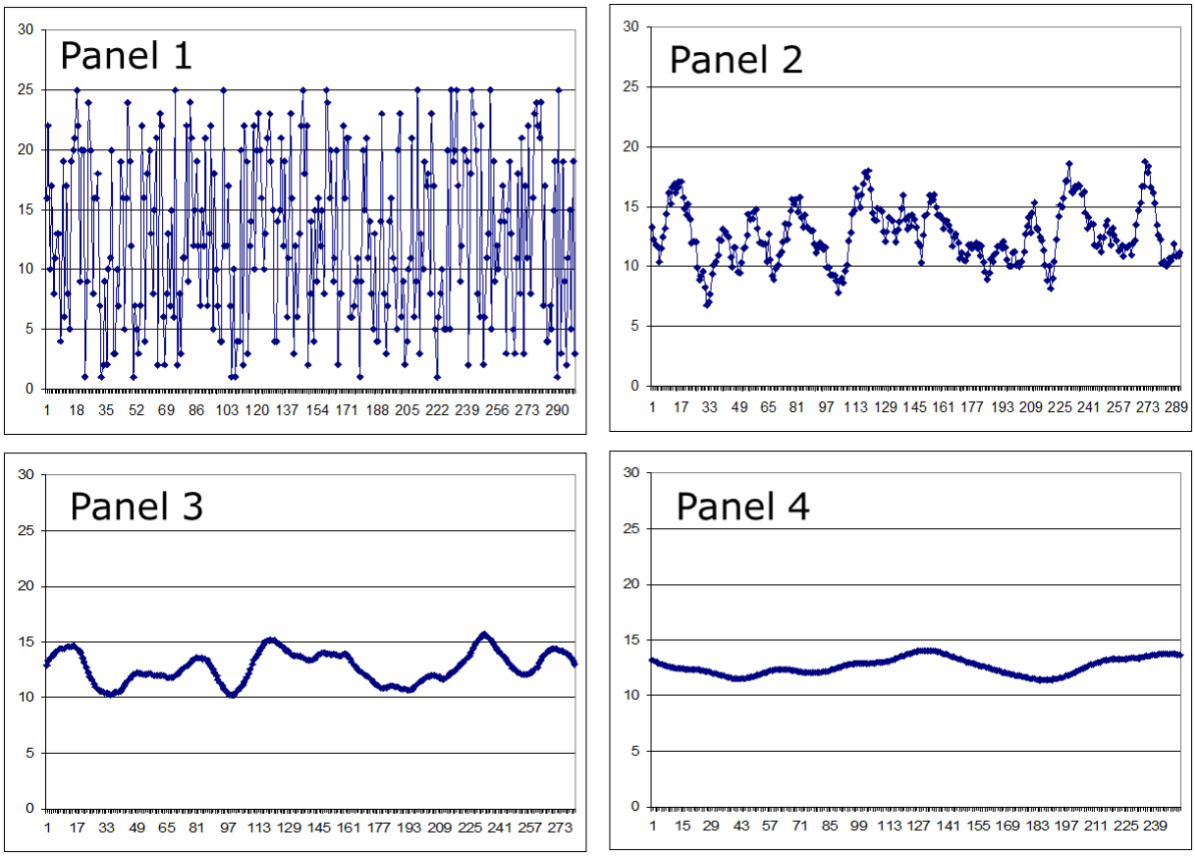
Through the myopic loss aversion framework, Benartzi and Thaler show that “the period over which individuals evaluate financial outcomes influences their investments in risky assets” (as cited in Gneezy & Potters, 1997, p. 632). In comparing stocks versus bonds, for example, a corollary is that individuals who have both stocks and bonds and who check their portfolios frequently are much more likely to react to local losses than individuals who do not check very frequently. In the context of Figure 1, for example, risk aversion is likely to result for agents who are loss averse. However, this tendency for loss aversion will be magnified if the agent sees a thin-slice of the data (for example, if agents are making a decision in Period 3 or Period 5). In a managerial decision making context, interventions that allow managers to see the big picture (by time) and who are aware and sensitive to the tendency for loss aversion are much less likely to fall prey to myopic loss aversion.

## Data Visualization

Many studies demonstrate that the format of the presentation of investment information has a significant effect on the interpretation, communication, and dialogue that result from it (Diacon & Hasseldine, 2007; Gentile et al., 2015; Linciano, Lucarelli, Gentile, & Soccorso, 2018; Raghubir & Das, 2010; Vlaev, Chater, & Stewart, 2009; Wang & Dowding 2010; Weber et al., 2005). Additionally, the importance of the presentation format of past performances of visuals rather than metrics and values over different time intervals was confirmed by Diacon and Hasseldine (2007).

A simple illustration of how data visualization could influence judgments or risk is provided in Figure 2. The four panels in the figure are generated from the exact same dataset of the price of a security over time. The first panel captures the fluctuation of price over very short time intervals – say an hour. The second panel takes the same data but uses a 10-period smoothed average (in this case, the average security price over a 10-hour window). The third and fourth panels again use the same data, but smoothed over 20 and 50 hours respectively. In workshop demonstrations with these four panels, even fairly sophisticated respondents who are aware of the smoothing believe that the security in the first panel is significantly riskier than those in subsequent panel. This illustration shows the power of data visualization in strengthening or weakening the myopic loss aversion effect discussed in the earlier paragraphs.

Figure 2. The Effect of Data Presentation on Myopic Loss Aversion




## Data Visualization—Perceived Complexity and Salience

The general presentation of data on information sheets for stakeholders is key. Aside from the format in which the historical return and volatility graphs are presented, the content load and data visualization used on such information sheets can change stakeholders' perceived risk (Gentile et al., 2015; Linciano et al., 2018; Vlaev et. al., 2009). For instance, several studies show that when information is presented in formats that are perceived by the stakeholder as being more complex, there is an increased perceived risk (Gentile et al., 2015; Linciano et al., 2018). Moreover, the perceived utility of the information presented decreases if the reader perceives it as being presented in a complex format (Gentile et al., 2015; Linciano et al., 2018). On one hand, a rational view suggests that the greater the volume of relevant information, the greater should be the quality of the resulting decision. On the other hand, if the information is presented in a complex format with little visual priming, then investors might experience cognitive overload, rendering it difficult for them to absorb information that is presented. In a study on textual priming methods on financial disclosures, Rennekamp (2012) labelled this diminished capacity to process information due to cognitive overload and lack of salience as processing fluency: Processing

fluency is defined as “an individual’s subjective feeling about how easy it is to process information” (p. 1320).

## Recognition Heuristics—Home Bias, Familiarity, and Overconfidence

The recognition heuristic occurs when a decision maker chooses an option based on recognition, rather than on the investment values, as they infer that the recognized option has a greater value. Weber et al. (2005) have shown that perceived risk, in fact, differs as a function of providing asset names, rather than of the information provided. In fact, when an asset’s name is known, there are reduced perceptions of risk, thus evidence of a ‘home bias’ in judgments of asset riskiness (Weber et al., 2005). When creating investment strategies, risk managers may not even be aware of home biases and recognition heuristics as these may be ingrained as ‘rules of thumb’—as such, they may be falling prey to the competence hypothesis (Buyalskaya & Wolfe, 2017; Gentile et al., 2015; Heath & Tversky, 1991). In sum, recognition heuristics may bias risk perception by generating overconfidence in one’s own judgments over the objective accuracy.

## Prioritization of Behavioural Factors

Throughout the Board of Directors’ decision-making process regarding risk-based investments, there are several behavioural factors that come into play that affect their ultimate decision. These factors include framing effects, perception, and recognition heuristics, amongst others (refer to Appendix A—decision map of such pain points).

While there are many behavioural factors and, therefore, many opportunities for behavioural interventions, there are several key pain points that have been prioritized and identified as the greatest opportunities to nudge the decisions of the Board of Directors in terms of mitigating for the downfalls of myopia (“short-termism”). More specifically, it was determined that one’s perception (particularly those of the members of the Board of Directors) presented the greatest opportunity for a behavioural intervention both in terms of feasibility and effectiveness. For instance, other behavioural factors such as the recognition heuristics (that is, home bias and status quo bias) would require constantly and consistently reminding people to be aware of their biases, which may not be effective. Furthermore, some framing effects such as myopic loss aversion may be difficult to target because the frequency of evaluating the returns of assets with a long product life cycle is determined by contextual factors, such as company mandate. Additionally, while many of the pain points stem from the actions of the risk team, the targeted behavioural factors of the Board of Directors will be the focus of the recommendations as these individuals are the ones to make the final investment decisions—their actions and behaviours loom closer to the ultimate decision. Moreover, by comparing the decision map of the Board of Directors with that of the risk team (Appendices A and B, respectively), the behavioural effects of perception (that is, those that are a priority in targeting) are only experienced by the Board.

# Part 2. Decision-Map Analysis

For this reason, albeit a very broad concept, there are three key factors of perception that will be focused on: cognitive overload, perceived complexity, and a lack of salience, in addition to noting the importance of prospect theory as another pain point in the decision-making process of Board members (all of which are highlighted in Appendix C).

## Cognitive Overload

The quarterly reviews between the risk team and Board of Directors cover a diverse range of agenda items, many of which are typically presented prior to the investment and risk portfolio presentation. This leads to the Board of Directors being bombarded with technical information both related and unrelated to their investment decisions during these meetings, and often with information that they do not understand considering their lack of financial literacy. Ultimately, this results in cognitive overload amongst Board members for the remainder of the meeting.

Overall, this may lead to suboptimal absorption and understanding of any following information—particularly regarding the complex investment and risk reports—thus resulting in suboptimal investment decisions (that is, investment decisions that fall prey to short-termism). As the information being presented increases, the negative effects of cognitive overload also increase, and this can be seen in the extended red bar in Appendix C as the effects of cognitive overload stem from the task of 'reviewing non-investment agenda items' prior to the risk presentation and affects all steps in the decision-making process as the presentation progresses.

## Prospect Theory

Investors and Board members (when presented with the information) use hypothetical 'compartments' in their minds (i.e., mental accounting) during the decision-making process, separating investment performance of each fiscal quarter into their own account. When making an investment decision, the Board may have an inclination to focus on a specific reference point (the last quarter) and their desire is to close each of these accounts with a gain, rather than a loss (due to loss aversion). As depicted in Appendix C, the negative effects of prospect theory are especially prevalent when the Board of Directors is presented with the previous quarter's performance directly before being shown the current performance, making the reference point much more salient. Overall, by treating each investment quarter as unique when conducting analyses and presenting recommendations, Board of Directors members thus tend to make their decisions based on this short-term point, rather than from the long-term objective. In other words, high-risk investments become less attractive than they otherwise would have been when viewed in narrow slices of time.

## Perceived Complexity

Both the visual and underlying challenges that the Board currently faces result in one key behaviour factor hindering the potential for ideal, long-term investments: perceived complexity. This phenomenon plays a significant role in the amount of risk that is perceived by these Board members, especially given that risk perception is highly context dependent. In other words, proper communication of risk has an increasingly important relevance. For instance, when the Board is presented with a complex set of tables created by the risk team, the performance of these investments is seen as riskier (Beshears, Choi, Laibon, & Madrian, 2011), compared to if they had been presented graphically, thus leading to suboptimal investment decisions amongst the Board of Directors (as depicted in Appendix C). Furthermore, Beshears et al. (2011) found that simply viewing any historical returns graph significantly raised the initial equity share by 11 to 12 percentage points relative to not viewing a historical returns graph. In addition, Figure 2 shows that the time horizon used for smoothing out past data could have a significant effect on risk perceptions. Overall, the visual presentation of past performance charts has a significant impact on fund choice and risk perceptions. For this reason, the perceived risk from the Board of Directors' perspective relies heavily on the responsibility of asset managers' visual presentation format of the investment values and information.

## Lack of Salience

While salience may typically have a negative connotation within a financial investment context as its effects may negatively overweight some events or values, within this context, it refers to the salience of the crucial insights embedded within the tables and values presented to the Board, and lack thereof. Although this information is critical for optimal investment decisions of the Board of Directors, with a lack of salience, the factors that go into their decision-making process continue to be bombarded with information that leads them to making suboptimal decisions.

With reference to Appendix C, it is important to note that the effects of perceived complexity and the lack of salience overlap as they are complementary of one another. When there is an increase in the perceived complexity of the information being presented, Board members are more prone to miss the salient points that would be necessary for them to make an informed investment decision that maximizes their long-term investments.

Overall, the combination of these three key pain points of perception result in the lack of questions being asked by the Board members during the Q&A period—the Board of Directors may disengage themselves from the conversation during this time as they do not understand the content well enough to form comprehensive questions. This effect may also lead to suboptimal investment decisions as the questions that they should be asking may be integral functions of their understanding of the information and critical analyses that have been presented to them.

# Part 3. Behavioural Nudge Recommendations

By combining the results from the behavioural interviews conducted with the different stakeholders of the decision-making journey (such as with Board of Directors, investors, and risk managers), the team has developed three recommendations that can be implemented in and prior to the Board of Directors meetings to generate more long-term focused investment decisions without imposing on the current foundation of the meeting structure. These three behavioural interventions address the four key pain points identified from the decision-map analysis—that is, cognitive overload, prospect theory, perceived complexity, and the lack of salience—in the form of behavioural nudges, which are discussed below.

## Recommendation 1: Restructure the Board of Directors' meeting agenda by placing the investment presentation towards the beginning.

This recommendation aims to curb and mitigate against the negative effects of cognitive overload and reduce the negative effects that derive from prospect theory. With regards to the decision map (Appendix C), the investment strategy is usually discussed after many other agenda items that are assumed to be more "urgent/important." As previously mentioned, such various items could result in an increasingly smaller limit in terms of the cognitive capacity that Board members have for the analysis of portfolio investments. In fact, the effects of cognitive overload lead to frequent judgment error and create restrictions on the ability to manage complex information and to make decisions (Cetina & Faust, 1987). Moreover, cognitive overload can create a sensation of insecurity and lower processing fluency, which might result in the Directors being more hesitant to raise questions that may possibly have led to longer-term investment strategies.

Considering that the investment presentation contains a significant amount of complex data and metrics, it requires time and patience for Board members to understand the content and then raise questions if they choose to do so. By placing the presentation towards the beginning of the meeting, this can mitigate the risk of Board members reaching their cognitive limits, allowing them to more effectively process and understand the complex financial information being presented to them. With reference to Part 2, it was previously discussed that the presentation of non-investment agenda items prior to the investment proposal results in the prolonged effects of cognitive overload (depicted in Appendix C), which ultimately hinder the final investment decisions from being long-term oriented. By placing the investment presentation first, this eliminates such negative effects throughout the rest of the meeting and allows for more potential of long-term investment behaviour with the increased cognitive capacity and thus understanding of the risk values.

Restructuring the agenda is a simple and feasible action that can be adopted by many companies around the world. Although there are several risks to consider, such as the potential of backlash resulting for a shift in agenda prioritization amongst departments, this is unlikely as this recommendation only suggests that the order of the meeting changes, rather than any of the content itself. Pilot testing can be conducted, while recording the results and reactions of the

recommendation's implementation—further action can be taken from their perspective depending on the respective company.

## Recommendation 2: Encourage the risk team to employ more visualizations to accompany financial metrics in the investment presentation.

This recommendation aims to reduce the negative effects generated by the perceived complexity and lack of salience experienced by the Board of Directors. The investment presentation is prepared by the risk managers (as depicted in the decision map of risk managers—Appendix B), who typically opt for the use of metrics, rather than visuals. It is important to note that, based on the interviews conducted, it was assumed that the metrics used must be kept consistent with market standards. For this reason, it is recommended that the risk team utilizes more graphs (rather than change any of their current content and metrics) that account for the effects of perceived complexity in visualization—graphs would be more easily understood by the target audience (the Board of Directors) (Linciano et al., 2018). We expect that this nudge will reduce the perceived complexity experienced by the Board members as there have been many studies supporting these positive effects. For instance, an experiment conducted by Weber et al. (2005) determining the impact of the type and the presentation format of financial information found that investors' expectations of risk were greater when they were provided with historical return information in the form of a table (i.e., metric values) rather than a graph.

Visualization of data can also improve the salience of important investment and risk figures (noting that salience is currently lacking in these risk presentations, as depicted in Appendix C), thus enhancing the effectiveness of the review and discussion, and ultimately encourage more long-term investment behaviour. In fact, in a study about visual priming—that is, the act of rendering certain pieces of information more salient—it was found that all investors are susceptible to salience (Wang & Dowding, 2010). In their study, Wang and Dowding (2010) found that when investors with limited financial knowledge (similar to members of a Board) were shown a financial information sheet that did not have any content that was immediately salient to the reader, they would feel a cognitive burden in the effort of trying to understand the information. This is due to the fact that Board members require time to carefully process information presented piece by piece (Wang & Dowding, 2010)—time that is not typically available during the tightly packed Board meetings. Moreover, in a study of perceived complexity, Linciano et al. (2018) mention that salience could also be a behavioural factor that could be used to decrease perceived complexity. It is important to note that, as indicated by the occurrences of the pain points in the decision map of Board members (Appendix C), the overlap of perceived complexity, lack of salience, and cognitive load reflect the negative effects of the lack of visualizations discussed above.

By implementing this recommendation, thus mitigating for the risks of perceived complexity, the lack of salience and cognitive load, naturally, Board members will indirectly be provided with more time to think about and process the crucial information presented in the proposals. Regarding the updated decision map of the Board, there can be an expected decrease in all the occurrences of such pain points. Moreover, this nudge may also result in an increase in confidence regarding asking questions related to long-term commitment, which may also lead to a reduction of the

presence of a self-serving bias (refer to Appendix A)—the need for Board members to maintain their self-esteem (Blaine & Crocker, 1993), and perceived competence—as this behavioural factor currently hinders the Board's tendencies to ask questions.

This recommendation is both feasible and scalable, especially considering that this nudge only requires the pre-existing financial expertise by the risk team and an addition to the current proposal/presentation formats rather than a change of their current contents. However, several actions must take place prior to its implementation to ensure its success and effectiveness. For instance, proper communication of the new visualization expectations should be done by senior risk managers to their teams. Several templated examples could be provided to the risk team during the initial launch of this recommendation as there will inevitably be a transitionary period from the typical use of tables and complex metrics towards a greater focus on visuals. Once implemented, the scalability of this intervention simply relies on the consistency of utilizing such visuals.

## Recommendation 3: Include annotations on the materials sent prior to the meeting.

This recommendation aims to tackle perceived complexity and the lack of salience. Studies have found that there is a positive relationship between perceived complexity and perceived risk that is a result of individuals not feeling confident in the information presented because it seems too complicated. This then leads Board members (in this case) to "transfer their opinion from the packaging (the template) to the content (the product). Therefore, they conclude that the more complicated the disclosure of the information is, the riskier the product is." (Linciano et al., 2018, p. 15). For this reason, materials (i.e., investment proposals) sent prior to the Board of Directors' meeting should be annotated, providing Board members with the opportunity to read through the details and their accompanying annotations regarding the risk information and metrics.

These annotations would not only explain the intuition and insights behind the metrics and values presented, but they would also further elaborate on the assumptions made by the risk team regarding relevant financial values. As a result, this nudge may lead to a decrease in the perceived complexity in two particular ways. First, through the provision of annotations that explain the financial values being presented, this reduces the risk of perceived complexity and allows the critical risk insights of the investments to be more salient. With regards to the decision map, this recommendation will target the effects of perceived complexity from its origin (when the Board receives the reports prior to the meeting—outlined in Appendix C), thus decreasing its effects throughout the rest of the decision-making process, along with the effects of the lack of salience as these two behavioural factors are complementary (as mentioned in Part 2). Second, the explanations aim to increase the confidence that Board members have in the information being presented to them in terms of their understanding and analysis of it. With this increased confidence, Directors may be more inclined to ask more questions during the Q&A periods, which may lead to insights that will ultimately encourage long-term investment behaviour.

Moreover, it is hoped that the inclusion of such annotations would spark further discussions around these annotations during the meeting, which could be complementary to FCLTGlobal's

conversation guide. The anticipated decrease in perceived complexity will allow Board members to focus more on asking the right questions that address the long-term investment strategies, rather than on focusing their cognitive capacity on understanding the information being presented to them.

This recommendation is easy to implement and scalable, because, similar to the second recommendation, the intervention solely depends on the pre-existing financial expertise of risk managers. However, the key threshold of this nudge is getting the Board members to read everything before the meeting. With respect to the mitigations of this risk, even if Board members do not read the proposals prior to the investment meetings, the targeted effects of perceived complexity and a lack of salience will still be addressed by these annotations as they will still be present on the information presented during meetings, the positive effects would just be delayed.

If all three recommendations are implemented, the meeting process would change and follow a similar structure: first, Board members will receive materials with annotations prior to the meeting, then the investment presentation will be discussed at the beginning of the meeting (prioritized on the agenda), in addition to the simplified and visualized data presented alongside the risk metrics. Through this updated decision map, we can foresee that the behavioural factors related to the pain points will significantly decrease or be eliminated. However, it is important to consider the further behavioural effects of this new process. For instance, it is possible that eliminated perceived risk will be replaced by overconfidence. It was found that people prefer to bet in a context where they consider themselves knowledgeable or competent than in a context where they feel ignorant or uninformed. These feelings of control and increased competence reduce perceived risk and increase investors' sense of assurance, although the do give rise to the self-serving bias.

# Part 4. Metrics

Along with developing the process and developing interventions to address the targeted behaviours of the decision makers, several behavioural metrics that align with the desired behaviours have been identified and are discussed below. Through the development of our recommendations and analyses, it has been understood that there is a cultural aspect that defines the scope of the underlying issues. Thus, we realize that prior to commencement of specific long-term decision-making behaviours, behaviours specific to an organization's culture need to be targeted first to ensure effectiveness of the proposed recommendations. Keeping these factors in mind, the following behavioural metrics have been designed to measure the effectiveness of our recommendations and are as follows:

Table 1. Metrics to measure behavioural outcomes

| | | Interpretation | | |
|---|---|---|---|---|
| **Recommendation (Desired Behaviours)** | **Behavioural Metrics** | **Definition** | **High Value** | **Low Value** |
| 1. To curb the negative effects of cognitive overload and prospect theory, **restructure the Board of Directors' meeting agenda by placing the investment presentation towards the beginning.** | Investment Term Increment (ITI) | ITI = Δ (Average term of investment decisions for the year, Average term of investment decisions of the past 3 years) | A high ITI is desirable, as it represents a shift to long-term investment behaviour. | A low ITI is not desirable, as it represents a shift away from long-term investment behaviour. |
| | Number of independent long-term focused discussions | Number of discussion items referencing long-term investment behaviours | A moderate to high figure (~2–3 additional references to the organization's mission of long-term decision making) is desirable and demonstrative of an overall conversation and sentiment towards long-term investment behaviours. | A zero or no additional reference to long-term decision making is reflective of organization's lack of complete consideration or participation towards long-term vision. |
| 2. To mitigate through perceived complexity and lack of salience from the perspective of the Board of Directors, **encourage the risk team to employ more visualizations to accompany financial metrics in the investment presentation.** | Number of Questions Asked | Number of questions asked around information represented by or around visual illustrations during the Q&A period at Board meetings | A moderate to high figure (~1–3 additional references to the organization's mission of long-term decision making) is desirable and demonstrative of an overall conversation and sentiment towards long-term investment behaviours. | A zero or no additional reference to long-term decision making is reflective of organization's lack of complete consideration or participation towards long-term vision. |

| | | | | |
|---|---|---|---|---|
| | Number of Discussion Items | Number of discussion items in the meeting (between the Board of Directors and the risk team) referencing the information from visualization | A moderate to high figure (~2–3 additional references to the organization's mission of long-term decision making) is desirable and demonstrative of an overall conversation and sentiment towards long-term investment behaviours. | A zero or no additional reference to long-term decision making is reflective of an organization's lack of complete consideration or participation towards long-term vision. |
| 3. To tackle perceived complexity and the lack of salience, **include annotations on the materials sent prior to the meeting.**<br><br>(These are annotations that would accompany the materials that are sent ahead of time. The goal of the annotations can be further elaborated on the assumptions within certain statistics, to create further salience on key points or to create a set of insights that provoke discussion. The hope is that by including annotations, there is a decrease in the perceived complexity of these snapshots.) | Number of Questions Asked | Number of questions asked around information represented by or around visual illustrations during the Q&A period at Board meetings | A moderate to high figure (~1–3 additional references to the organization's mission of long-term decision making) is desirable and demonstrative of an overall conversation and sentiment towards long-term investment behaviours. | A zero or no additional reference to long-term decision making is reflective of an organization's lack of complete consideration or participation towards long-term vision. |
| | Number of Discussion Items | Number of discussion items in the meeting (between the Board of Directors and the risk team) referencing the information from visualization | A moderate to high figure (~2–3 additional references to the organization's mission of long-term decision making) is desirable and demonstrative of an overall conversation and sentiment towards long-term investment behaviours. | A zero or no additional reference to long-term decision making is reflective of organization's lack of complete consideration or participation towards long-term vision. |

# Conclusion

Research in the area of behavioural economics has shown that individuals do not evaluate the riskiness of an investment from a purely rational, numerical, and consequentialist approach. Furthermore, investment outcomes can only be estimated and have a degree of uncertainty attached to it and adds to the difficulty of choosing between different investment vehicles. To effectively foster what one might call "long-termism" within investment strategies and have better discussions around risk, financial institutions should focus on taking a more human-centric approach by targeting the behavioural effects of perceived complexity, the negative effects of prospect theory, salience, and cognitive overload.

Quantitative metrics such as standard deviation and the Sharpe Ratio contain various assumptions and limitations (see Ambrosio, 2007), and these assumptions are not highlighted when metrics are simply presented numerically. Even if current risk metrics are modified or are replaced by new ones, presenting and discussing the numbers themselves may not provide the full risk picture. More attention needs to be paid to how information is presented and how critical investment meetings can be designed so that more productive conversations around risk is facilitated. Through our three recommendations, FCLTGlobal's member organizations should be able to successfully nudge Board members such that they feel aptly prepared to ask risk teams about the long-term implications of the risk measurements used in their presentations and demonstrate an increase in long-term investment behaviour.

Our paper has focused on simple interventions that we believe will reduce myopia and get decision-makers to focus on long-termism. That said, we believe there are broader structural issues that need to be addressed in the longer run. The first issue relates to the trade-off between time and resources that managers and board members allocate to shorter term "management and evaluation of performance" tasks versus longer term "strategic planning" tasks. We believe that both managers and board members likely devote a disproportionate amount of resources to the management and evaluation tasks for a couple of reasons. One, these short-term tasks are based on copious numerical data, which might be seen as more scientific or hard evidence than projections of the future; and two, board members (in particular) might misperceive their responsibilities as primarily involving oversight, management and evaluation rather than helping with strategic planning. The second issue relates to incentive structures and can be broadly posed as the following research questions – How can we expect managers and board members to think long term when current incentive structures are heavily skewed towards short term performance? How can we design incentives to reward long-termism? Both of these broader issues are worthy of additional research and debate!

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# Appendices

## Appendix A: Decision Map—Board of Directors

| | Frequency | Initial context | Ongoing basis | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | Overarching Activity | | Pre-meeting | | Trustee meeting | | | | | | Decision making |
| | Action | Certifications, education background, and industry experience | Think about the long-term vision as per company mandate | Receive the agenda and reports prior to the meeting | Review non-investment agenda items | Re-read the risk report while the risk team is preparing to present | Review the previous and current quarterly performance based on the standardized metrics (risk and return) | Apply their own insights and knowledge of the indsutry to the data that they are presented with | Analysts on the risk team explain the reports and help the BoD determine the best option for investments | Decide whether to ask further questions | Make a decision regarding the reallocation of resources |
| Behavioural factors | Framing effects | | | | | | Prospect Theory | | | | Prospect theory |
| | | | | | | | Myopic loss aversion | | | | Myopic loss aversion |
| | | | | | | | Mental accounting | | | | Mental accounting |
| | Perception | | | Perceived complexity | | Perceived complexity | | | Perceived complexity | | |
| | | | | | | Lack of saliency | | | Lack of saliency | | |
| | | | | | Cognitive load | | | | | | |
| | Recognition heuristics | | | | | | | | Status quo bias | | |
| | | | | | | | | Home bias | | | Home bias |
| | Other | | | | | | | | | | Endowment effect |
| | | | | | | | | | | Self-serving bias | |
| | | | | | | | | | | Social norms (groupthink) | |
| | | | Lack of awareness of inherent biases | | | | | | | | |
| | Context | Most BoD members don't have a financial background, so it is typical for them to have a lower level of financial literacy than the risk team | BoD often serves a more advisory role - they have to ensure the long-term well-being of the company and also avoid short-term downfalls | Realistically, they don't typically go through the reports prior to the meeting, let alone thoroughly | | As they re-read the risk report, they perceive it as complex and fail to find the salient points. When the risk team presents, they will have been listening to so much information on different topics, that there will be cognitive overload due to the information overload. The directors cannot effectively engage with the material. | | | | The BoD members typically remain silent, despite confusion, ambiguity or lack of knowledge | |

## Appendix B: Decision Map—Risk Team

| | Frequency | Initial context | Ongoing basis | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Overarching activity | | Prepare the investment and risk portfolio to present at the quarterly meetings | | | | | | | | Presentation at the trustee meeting | | | |
| | Action | Given company standards* | Regularly monitor developments in portfolio as per company mandate | Apply the standardized metrics (typically include standard deviation, variance, Sharpe ratio, and other normal distribution based KPIs) to the current scope of data | Analyze data and highlight insights and trends (by fiscal quarter) | Research and review the decision options before developing the recommended action plan | Choose a template to prepare the report for the board meeting | Select key insights | Prepare the committee reports and presentation that define the decisions for which the BoD is responsible (i.e. data is visualized) | Send the reports to the BoD prior to the meeting for their review | Wait for non-investment items to finish | Present the prepared investment and risk reports and quarterly/yearly performance | Share insights and developed recommendations |
| Behavioural factors | Framing effects | Prospect theory | Return to yield (anchoring effect) | | Prospect theory (anchoring effect) | | | | | | | | Anchoring effect |
| | | Myopic loss aversion | | | Myopic loss aversion | | | | | | | Myopic loss aversion | |
| | Recognition heuristics | | | Status quo bias | | | Status quo bias | | Status quo bias | | | | Status quo bias |
| | | | | | | | | Familiarity bias | | | | Familiarity bias | |
| | | | | | Home bias | | | | | | | | |
| | Other | | | | Endowment effect | | | | Endowment effect | | | | |
| | | | Lack of awareness of inherent biases | | | | | | | | | | |
| | Context | Risk managers are evaluated based on their ability to mitigate losses and maintain/obtain high returns per quarter/per year | | Standard risk metrics often contain hidden assumptions that would have long term implications | | | Risk managers tend to fill out a template from a set of fixed, pre-scheduled templates, without considering the product life cycle; this might give irrelevant information | When preparing for the meeting, the manager might avoid highlighting contradictory information in order to offer a stronger, more cohesive analysis | | | The agenda often prioritizes the meeting according to urgent items first | | |

*Note: Board of Directors (BoD)*

**Company standards include: company mandate, tolerance for risk, structures and policies, investment goals, budget and the annual calendar that specifies major performance reviews with the Board of Directors (BoD) (typically quarterly)*

## Appendix C: The Key Pain Points (from the Perspective of the Board of Directors) that the Behavioural Interventions Address

| | Frequency | Initial context | Ongoing basis | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | Overarching Activity | | Pre-meeting | | Trustee meeting | | | | | | Decision making |
| | Action | Certifications, education background, and industry experience | Think about the long-term vision as per company mandate | Receive the agenda and reports prior to the meeting | Review non-investment agenda items | Re-read the risk report while the risk team is preparing to present | Review the previous and current quarterly performance based on the standardized metrics (risk and return) | Apply their own insights and knowledge of the indsutry to the data that they are presented with | Analysts on the risk team explain the reports and help the BoD determine the best option for investments | Decide whether to ask further questions | Make a decision regarding the reallocation of resources |
| Behavioural factors | Framing effects | | | | | | Prospect Theory | | | | Prospect theory |
| | Perception | | | Perceived complexity | | Perceived complexity | | | Perceived complexity | | |
| | | | | | | Lack of saliency | | | Lack of saliency | | |
| | | | | | Cognitive load | | | | | | |