

# **Impact of Contextual Determinants Towards the Disposition Bias of Individual Investors in the Sri Lankan Stock Market**

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## **Abstract**

The study of individual investors is complex in behavioral finance. Individual investors decision-making making associated with psychological cognitive drivers which involve disposition bias disqualified from rational investment decisions. The previous studies recognized disposition bias was limited in addressing cause and effect. The findings are important for individual stock investors and potential investors significantly; can be attentive to their own cognitive and emotional factors in their accurate investment decisions. A survey model was conducted among the 306 individual investors on Colombo Stock Exchange (CSE). The events, beliefs, behavioral consequences, loss aversion, disposition and investor sentiment were measured through standard questionnaires of previous scholarly articles. The data were analyzed using structural equation modelling (SEM) with AMOS software. The empirical data supported that loss aversion and investor sentiment positively impacted the disposition bias of individual investors. The events, beliefs and behavioral consequences (emotion) do not considerably drive factors of disposition bias in the Sri Lankan stock market. The findings revealed that loss aversion and sentiment is the key driver of the disposition bias existence which is confirmed by the findings of the previous scholar. Moreover, the study confirmed the mediation impact of events, and loss aversion through disposition bias. The main theoretical contribution of the paper is; the ABC model does not fully support in Sri Lanka context to address the disposition where the loss aversion contributes to the execution of the disposition and moderating by investor sentiment. The present findings will be useful for the investors, potential investors and the stockbroker firms for maintaining and leading the substantial confident decision making reducing of having biased decisions in the Sri Lankan context. The study recognized the biases of individual personality with nature in the initial structure before leading to disposition bias. The data collection period was limited to the second half of the year 2020 and the

generalization is restricted for the Sri Lankan market. The macroeconomic implications and the institutional investors do not consider in the study due to complexity. The study confirmed the relationship and impact of loss aversion towards disposition bias. The paper recommended that the investors with risk-averse (loss averse) lead for the disposition. The disposition is considerably dependent on the loss-averse attitude of the individual personality and moderated by investor sentiment.

**Keywords:** *Disposition Bias, Loss Aversion, Colombo Stock Exchange, Individual Investors*

### **Introduction**

Investors' tendency to hold losing investments too long and sell winning investments too soon is recognized as disposition bias in technical language. Traditional finance theories are built on the key assumption that investors are rational beings, which aligns with the Efficient Market Hypothesis (EMH). Behavioural Finance uses insights from investor psychology to explain the irrational behavior and biases of individual investors. Behavioural Finance is a finance field that explains stock market anomalies using identified psychological biases (Fama, 1998). Behavioural finance recognizes various types of biases, including overconfidence, herding, loss aversion, disposition and self-attribution. Thus, disposition bias positively and negatively influences investors' decision-making on the Colombo Stock Exchange (CSE), and this has been empirically proved by researchers (Siraji & Buvanendra, 2019). Investors on the CSE may place too much faith in their forecasts, leading to bias in their actions (Pathirawasam & Edirisinghe, 2011). Therefore, it is worthwhile to study and understand individual investors' behaviour on the CSE and the determinants influencing their decisions.

The Colombo Stock Exchange (CSE) has 289 listed companies representing 20 industrial groups as of 30th June 2020. In the year 2018, the CSE made a strong start with investors entering capital markets with an optimistic outlook. However, the situation had reversed by Feb 2018, starting with a stock market correction worldwide. Despite an unprecedented business landscape, the CSE had to reduce market capitalization to 2% in 2018. An active primary market mainly drove this trend with thirteen new issuances (equity and debt securities). Investors' active participation is necessary for stock market development since it impacts the country's economic growth. The Sri Lankan stock market

contributes largely to the Sri Lankan economy and attracts foreign investments. Therefore, studying investors on the Colombo Stock Exchange is essential in the current context to attract investors for expansion.

Traditional finance seeks to understand financial markets using models in which agents are understood to be “rational”. Rationality comes in two ways. The first argument explains how investors receive information and agents update their (investors’) beliefs correctly. The second argument contends that investors provide their opinions and that agents, using these opinions, make normative and acceptable choices. Traditional financial theories explain the rational decision-making of rational investors. The Bounded Rationality Theory, however, suggests that investors’ decision-making is not fully rational but is ‘bounded by rationality. It explains that individuals are keen to make satisficing decisions rather than optimizing decisions. In the real world, rational decision-making is not applicable. Simon suggests that economic agents use heuristics to make decisions rather than applying a strict, rigid rule of optimization because of the complexity of many situations (Simon, 1955).

In the light of Simon’s evaluation, psychologists became more concerned with incorrect (irrational) human interpretations of chances. The preliminary study in this direction was argued by Kahneman & Tversky (1979) in prospect theory, which explained how bounded rationality works in human beings. The prospect theory pointed out that assessing an alternative’s outcome comes from individual personal judgment based on mental shortcuts, namely, heuristics, that govern human beings’ rationality concerning decision making (Tversky & Kahneman, 1973, 1974). The prospect theory describes that people decide between alternatives that involve risk and return (Tversky & Kahneman, 1973, 1974).

Further, there is an alternative model of decision making under risk and uncertainty. The advantage of the theory is that it explains loss aversion, overreaction and behavioral biases. Loss aversion is a situation in which people generally opt to take a chance rather than bear guaranteed losses in an investment option (Shefrin, 2000). The rational and irrational behavior of the cognitive psychological perspective that does not explain cause and effects lead to disposition bias. The modern finance theoretical perspectives are described by (Miller,1999), while the behavioural finance historical development is well explained by (Ritter, 2003), (Baker & Nofsinger, 2010), (Statman, 2014) and (Thaler, 2016). From a psychological perspective,

irrationality in human decision-making is fundamental to human nature (Ellis, 1976).

According to behavioral finance models, every individual has unavoidable psychological biases that prevent them from making rational decisions and these have adverse effects on investment decisions and market efficiency. (Bakar & Yi, 2016) found that psychological factors have a significant impact on the decision making of individual investors in stock markets. According to (Baker & Nofsinger, 2010), “cognitive errors”, “fundamental heuristics” and “psychological biases” affect the investment decision-making process. Mental biases are alluded to as convictions and inclinations (Pompain, 2006). Investment decision making and market efficiency are complex concepts that scholars are still discussing. There is a positive connection between the economy and the securities exchange; the stock exchange's deterioration will adversely affect the economy and vice versa. Thus, individual investors' decisions on the securities exchange have a critical part to play in deciding market development, which manages the economy (Kengatharan & Kengatharan, 2014). However, scholars have found that an individual's psychological make-up strictly correlates with their investment decisions on the Stock Market (Ajmal et al., 2011), (Baker & Nofsinger, 2002), (Shefrin, 2006).

The current research study focuses mainly on disposition bias, a mental heuristic in behavioral finance. Traditional finance discusses and elaborates on rationality, though the concept is outdated compared to the concept of irrationality which scholars in the 1970's examined. The ABC's of rational-emotive therapy (RET) and of cognitive-behavioural therapy (CBT), explained what complex cognition, emotions, and behavior are and how they inevitably include and interact with each other. (Ellis, 1991).

The ABC Model of causation provides an underlying model to understand the cause and effect of behavioral anomalies demonstrated by investors in the stock market (Ellis, 1991). The ABC Model is based on the primary model with C-behavioral consequences (behavioral anomalies, positive or negative) that arise from B- core beliefs (affective and cognitive which contain both rational and irrational elements) triggered by various types of A- activating events. Through this model, the root cause of irrational human behavior can be understood logically by the theory of causation, leading to the disposition bias.

Disposition bias is derived from loss aversion; one of the basic phenomena of choice under both risk and uncertainty, disposition bias

indicates that losses loom larger than gains (Kahneman & Tversky, 1984; Tversky & Kahneman, 1991). Prospect Theory explains disposition through three main components, namely, activating events, beliefs and behavioral consequences, as explained in the ABC model (Ellis, 1976). Sentiment contributes to the model as a moderating factor. Investor Sentiment in the state (optimistic or pessimistic) induced by a particular (favorable or unfavorable) event. The proxies of investor sentiment influence investor decision making (Baker & Wurgler, 2006).

The ABC model was tested by (Brahmana et al., 2012) to investigate psychological biases and day-of-the-week anomaly. These researchers tested whether the day effect combined with the theoretical ABC model. The scholars tested day-of-the-week anomalies (DOWA) empirically in the stock market using the ABC model, and they explored the role of psychological biases on the DOWA. They were able to conclude that the five psychological factors might influence the DOWA.

Every investor desires to make optimal investment decisions (Sharpe, 1964), in such a way that they can maximize their wealth. According to (Merton, 1987), optimal and rational investment decisions depend on advanced financial knowledge. Standard finance assumes that people have complete information and make rational decisions all the time. Imperfect information (Bikhchandani et al., 1992), bounded rationality (Pompain, 2006), anomalies (Ajmal et al., 2011), fundamental heuristics (Baker & Nofsinger, 2010), psychological biases (Baker & Nofsinger, 2002) or behavioral biases (Shefrin, 2007) and psychological accounts of investors' mental prestige play a key role in understanding irrational decision making. These research findings have been critically evaluated in the literature review.

Most individuals are averse to losing realization. Due to this reason, investors continue to keep their stocks while their prices are reduced. The expectation is that the price will rise the next day. (Shefrin & Statman, 1985). The findings proved that the disposition effect is not a laboratory experiment but shows up in real-world financial markets as well. The causes for this are not identified in this study, but the implications have been closely monitored.

The existence of disposition bias in a market may have different implications on that market's performance. One of the main implications is the price reversal of losing and winning stocks due to the buying and selling pressures inflicted on those two stocks, respectively (Bandara, 2012). This

particular research study is based on the Colombo Stock Exchange (CSE) over the period 2006 to 2010 using 20 stocks. Secondary data were used, and the study concludes that unobservable factors (firm-specific and time-specific factors), such as the disposition effect, affect individual investor behaviors. The findings reveal a disposition bias, but the reasons and causes for this disposition have not been found, as per previously mentioned articles.

Behavioral biases significantly impact investor behavior on the Colombo Stock Exchange (CSE) (Kengatharan & Kengatharan, 2014). The results of this study were summarized based on three hypotheses. The final results revealed that heuristics, market, prospect and herding impact the investment decisions of individual investors in the CSE. The cross-sectional design was used to collect quantitative data, and data synthesized from the questionnaires were sent to individual investors in the CSE. The data collected from questionnaires provide a basic understanding of the factors affecting investors' decisions in the CSE. Questionnaires were sent to respondents chosen using the stratified random sampling method. Stratified sampling ensures that the sample is distributed in the same way as the population (Bryman & Bell, 2007).

The Likert scale used (Likert scales are rating scales used for soliciting respondents' opinions and attitudes) ranged from 1 to 6: strongly disagree, disagree, no opinion, agree, and strongly agree.

There was a finding on disposition bias among individual and team investors, where the researchers have found and experimentally analyzed the disposition effects of team and single investors. The findings highlight that decision bias occurs in both scenarios. (Rau, 2015) However, the effect is more pronounced for team investors. Moreover, the data show that teams suffer less capital losses than individuals. At the same time, they tend to realize more capital gains than single investors. The study was based on secondary data and determined the proportion of gains realized (PGR) and the proportion of losses realized (PLR). The PGR (PLR) is the number of realized capital gains (losses) divided by the total number of capital gains (losses), which could be potentially sold. The same concept was tested by (Odean, 1998) using 10,000 individual stockbroker accounts.

One study confirmed that the disposition effect in a simple risky choice happens when choices are taken consecutively. However, when choices are planned, and a contingent (option) plan is defined, a reversal in the disposition effect is observed (Ploner, 2017). This researcher further

recognized and argued that a reverse disposition bias will be observed when choices are planned, with losers less likely to hold on to their investments than in the sequential condition in which no reaction to losses are planned. While winners' behaviour does not significantly differ across the two choice protocols, losers' behaviour changes significantly, thus reversing disposition bias. A new insight revealed by this research was the role of investment planning on the reversal of disposition bias.

The findings of the study by Ahmad (2019) show that extraversion, industriousness and risk-attitude are associated with disposition bias. This suggests that investors with extraversion and industriousness traits are more optimistic (positive) and rely on their skills, knowledge and experience to make investment decisions (Ahmad, 2019). The data were collected from undergraduate and post-graduate students from two well-known universities in Peshawar, Pakistan. A total of 405 students partook in the exercise, and 396 questionnaires were used for data analysis. The results revealed that risk-attitude negatively moderates the association between extraversion, agreeableness, and investors' disposition bias. This proves that investors with a high level of extraversion and agreeableness under risk attitudes have a lower tendency to exhibit disposition bias. Risk attitude helps individuals (those with extraversion and agreeableness) to carefully select, analyze and, update portfolios. The arguments of (Ahmad, 2019) are supportive and are in line with the argument built by (Durand et al., 2008) who point out that "personality is the main driver of individual behavior". The above researchers suggest the importance of real-time investor data to capture investors' actual behavior, which would lead to more accurate results (Durand et al., 2008).

Another research study provides evidence that among the behavioral factors, anchoring, disposition effect, overconfidence and risk perception have a considerable positive or negative influence on investors' investment decision making on the CSE (Siraji & Buvanendra, 2019). These researchers identified and explained gender representation as a moderating effect on the relationship between behavioral factors such as anchoring, disposition effect, herding, overconfidence, risk perception and stock investment decision making. The study was conducted as a survey of individual investors on the CSE. The primary data were collected using a standard questionnaire based on a five-point Likert scale. Ultimately, 405 usable questionnaires were received. However, there are very few research articles on disposition bias in the Sri Lankan context. Comparatively,

western countries are rich with behavioral finance studies, both primary and secondary studies.

Disposition bias is affected by age, and herding bias is influenced by profession. The study further explains the impact of demographic features such as gender, age, income, and occupation on stock investors' investment behaviour in Indonesia (Elizabeth et al., 2020).

Scholarly articles from the 1950s came up with different arguments and models. At that time, it was popular and common for most scholars to follow Odean (1998), secondary data model, to test disposition bias, where the model was developed through daily share prices. Another set of scholars used only one variable to test the existence of disposition bias in the stock market. A few scholars recognized the impact of psychological factors on disposition bias and the causes of disposition bias. However, the reasons that drive the disposition effect have not been comprehensively addressed in the past literature, and therefore, the current study aims to fill this research gap.

### **Hypotheses and Conceptual Model**

The conceptual model derived from three independent variables, one mediating variable, one moderating variable and a dependent variable is illustrated in a conceptual framework. Activating events, beliefs, and consequences are considered independent variables; loss aversion is considered as a mediating variable; investor sentiment is regarded as a moderating variable, and disposition bias is considered as a dependent variable. The eleven hypotheses developed as follows.

#### ***The Impact of Loss Aversion on Disposition Bias***

##### ***Hypothesis 01-***

*There is a positive relationship between activating events and the loss aversion of individual investment decisions*

##### ***Hypothesis 02-***

*There is a positive relationship between core beliefs and loss aversion of individual investment decisions*

##### ***Hypothesis 03-***

*There is a positive relationship between behavioral consequences on the loss aversion of individual investment decisions*

##### ***Hypothesis 08-***



*There is a positive relationship between loss aversion and the disposition bias of individual investment decisions*

*Hypothesis 09 –*

*There is a positive relationship between activating events and the disposition bias of individual investment decisions mediated by loss aversion*

*Hypothesis 10 –*

*There is a positive relationship between core belief and disposition bias of individual investment decisions mediated by loss aversion*

*Hypothesis 11 –*

*There is a positive relationship between behavioral consequences and disposition bias of individual investment decisions mediated by loss aversion*

#### ***The Impact of Activating Events on Disposition Bias***

*Hypothesis 04 –*

*There is a positive relationship between activating events and individual investment decisions' disposition bias*

#### ***The Impact of Core Beliefs on Disposition Bias***

The argument is that for emerging markets such as Sri Lanka, it is essential to test this for the betterment of investor decision-making.

*Hypothesis 05 –*

*There is a positive relationship between core beliefs and individual investment decisions' disposition bias.*

#### ***The Impact of Behavioral Consequences/ Emotions on Disposition Bias***

*Hypothesis 06–*

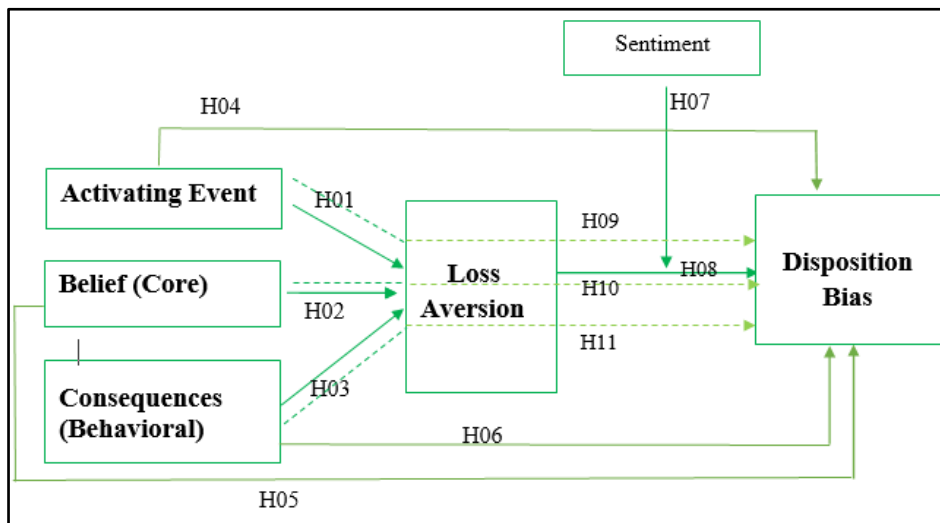
*There is a positive relationship between behavioral consequences and individual investment decisions' disposition bias.*

#### ***The Impact of Investor Sentiment on Disposition Bias***

*Hypothesis 07 –*

*Investor sentiment moderates the positive relationship between activating events, beliefs, behavioral consequences and disposition bias of individual investment decisions.*

The main hypotheses developed and it is given in figure 1.1



**Figure 1.1 - Conceptual Model of the Study**  
 Source: Author's data

Figure 1.1 was developed based on the two theories, the Prospect theory and the ABC model. The ABC Model (Ellis, 1976) explained the three main causes of disposition bias: an activating event, core beliefs, and behavioral consequences. The feeling is in line with experiences, core evaluations (attitudes) regarding investment decisions, and emotional behavior. The above said three antecedents lead to loss aversion. The dotted lines represented the mediation impact of the variables. The assessment of an alternative's outcome comes from individual personal judgment based on mental shortcuts in an uncertain situation with fast decision-making. (Tversky & Kahneman, 1973, 1974).

### Methodology

The unit of analysis is individual investors in the Colombo Stock Exchange (CSE). Based on the availability population number (647,584), the sample size was calculated using Solvins's formula  $n = N/(1+Ne^2)$ . According to the Solving's Formula, the sample size calculation answer is given as 242 minimum responses out of investors of CSE at 95% confidence level. The data analysis process through SPSS AMOS software 22.0 where collected 315, which of nine excluded due to incompleteness; finally filtered as 306 pure responses for the study.

### Data Analysis and Results

A pilot study was conducted with 30 respondents (individual investors) to assess the questionnaire's face validity and reliability which Cronbach alpha is 0.737 and Pearson correlation Analysis closer to zero proof that the validity and reliability.

The multivariate assumptions, homoscedasticity, normality and multicollinearity, were assessed and confirmed. For all items, the factor loadings were above 0.7, excluding one variable, 'Activating Events". However, the variable could not be excluded due to the theoretical link to the model. Further, the Cronbach alpha value was greater than the 0.7 level. The Cronbach alpha value test was carried out to test for consistency and reliability.

### Measurement Model

Confirmatory Factor Analysis (CFA) with Structural Equation Model (SEM) was evaluated through the AMOS 22.0 version with a sample size of 306. The final results of the descriptive statistics, reliability and validity tests are given in Table 01.

Variable	Number of Items	Mean	Standard Deviation	Cronbach Alpha	CR	AVE
Events	02	4.13	.47	.351	.46	.50
Belief	03	3.71	.65	.822	.66	.40
Behavioral consequences	03	3.73	.62	.666	.68	.41
Loss Aversion	02	4.09	.55	.605	.08	.32
Investor Sentiment	22	3.74	.75	.946	.97	.62

**Table 01: Descriptive Statistics, Cronbach's Alpha, CR, AVE**

*Source: Author Created based on SPSS AMOS output*

The GOF (Goodness of Fit) indices confirmed the appropriateness of the model. For the measurement model, all correlations and standard regression weights were significant at the 95% confidence interval. Moreover, the GOF results proved that the absolute fit indices validate the fit between the observed data and the model. The incremental values being close to the 01 levels, and within the range 0.290 - 0.377, confirmed that the model fit was good (Hair et al., 2010). Therefore, the model reported

satisfactory GOF indices and the present study validated the fit between the observed data and the model.

The first structural model to test Hypothesis 01: *There is a positive relationship between activating events and loss aversion of individual investment decisions.* The resulted in fitness indices that the  $\beta = 0.113$  and P-value (.337) > 0.000 support the rejection of the hypothesis, which says that there is no positive relationship between activating events and loss aversion.

Hypothesis two (*There is a positive relationship between core beliefs and loss aversion of individual investment decisions*) resulted in the  $\beta = 0.585$  and P-value (.949) > 0.000 supports the rejection of the hypothesis which says that there is no positive relationship between core beliefs and loss aversion.

Hypothesis three (*There is a positive relationship between behavioral consequences and loss aversion of individual investment decisions*) resulted in the  $\beta = 0.212$  and P-value (.984) > 0.000 ensuring the rejection of the hypothesis which says that there is no positive relationship between behavioral consequences and loss aversion.

Hypothesis four (*There is a positive relationship between activating events and individual investment decisions' disposition bias*) resulted in the  $\beta = 0.091$  and P-value (.483) > 0.000 supporting the rejection of the hypothesis which says that there is no positive relationship between activating events and disposition bias.

Hypothesis five (*There is a positive relationship between core beliefs and individual investment decisions' disposition bias*) resulted in the  $\beta = 0.462$  and P-value (.975) > 0.000 support the rejection of the hypothesis which says that there is no positive relationship between core beliefs and disposition bias.

Hypothesis six (*There is a positive relationship between behavioral consequences and individual investment decisions' disposition bias*) resulted in the  $\beta = 0.168$  and P-value (.71) > 0.000 ensures the rejection of the hypothesis which says that there is no positive relationship between behavioral consequences and disposition bias.

Hypothesis seven (*Investor sentiment moderates the positive relationship between activating events, beliefs, behavioral consequences and disposition bias of individual investment decisions*) resulted in the  $\beta = 0.126$  and P-value (.000) > 0.000 ensures the acceptance of the hypothesis

which says that there is a moderating impact from investor sentiment on the relationship of the irrational behavior of disposition bias.

Hypothesis eight (*There is a positive relationship between loss aversion and disposition bias of individual investment decisions*) results in the  $\beta = 0.09$  and P-value (.023) > 0.000 support the acceptance of the hypothesis; which says that there is a positive relationship between loss aversion and disposition bias.

The mediating impact was tested in Hypothesis nine (*There is a positive relationship between activating events and disposition bias of individual investment decisions mediated by loss aversion*), Hypothesis ten (*There is a positive relationship between core belief and disposition bias of individual investment decisions mediated by loss aversion*) and Hypothesis eleven (*There is a positive relationship between behavioral consequences and disposition bias of individual investment decisions mediated by loss aversion*). The mediating impact was that of activating events, beliefs and behavioral consequences through loss aversion towards disposition bias. The mediating effect of the model was tested via direct and indirect pathways using the AMOS 22 version. There was only one partial mediation detected for the relationship between activating events and disposition bias through loss aversion. The remaining two mediations were not significant, nor were there any partial or full mediations detected (belief, disposition through loss aversion; behavioral consequences, disposition through loss aversion).

The data analysis revealed that a strong mental behavioral bias leads to disposition bias. The theoretical ABC model embedded to test its contributions did not add value to the findings. An important factor in prospect theory, which is loss aversion cognition, was found to be a key driver for the execution of disposition bias in the Sri Lankan context. Therefore, in the Sri Lankan context, it is necessary to overcome a “loss averse” attitude to prevent disposition bias. This is the positive contribution of the study to individual investors, stockbroking advisors and potential investors in Sri Lanka.

### **Limitations and Directions for Future Research**

As previously explained, disposition bias is one of the psychological biases in behavioral finance. There are more than seventeen (17) psychological biases according to scholarly articles (Kumar and Goyal, 2014), (Zahera and Bansal, 2017). The current study only focused on

disposition bias which was recognized initially by Kahneman and Tversky (1979). The study is limited to one bias, though several biases may have been in operation concerning individual investors' decisions (Kengatharan and Kengatharan, 2014), (Siraji and Buvanendra, 2019). The sample size was limited to 306 individual investors since it was difficult in practical terms to cover the entire population. If the study were done on the entire population, the results may have been different. Also, in this study, investors were taken as a whole in a gender-blind manner whereas (Siraj and Buvanendra, 2019) have found that gender has a significant moderating effect on bias. Future researchers can replace the ABC model with another appropriate model that is more suited for psychological biases.

### **Conclusion**

The study's main aim was to contribute to the existing knowledge on the behavioral bias of disposition and its antecedents affecting individual investors in the Sri Lankan market. Studies have been conducted to identify whether biases exist in the stock market or not. However, there have only been limited studies on the antecedents of biases leading to irrational decision-making patterns. Disposition bias is led by the loss aversion context of each behavior. Also, the disposition is significantly moderated by the investor sentiment for the irrational decision-making. An investment cannot be recognized as positive or negative initially, but its consequences have to be borne by the investor. The leading cause for the irrational behavior of the Sri Lankan market is loss aversion. The findings of the current study can be applied to the Sri Lankan context, where future research can be designed on a different platform to test the overall model of biases. The knowledge on investors' behavior provided by this study can be further extended and honed for better outcomes with the suggestions mentioned above. These suggestions might be a useful guide for individual investors to design their share portfolios and to make sound investment decisions.

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