A study of prominence for disposition effect: a systematic review
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Abstract
Purpose – The purpose of this paper is to study the disposition effect that is exhibited by the investors through the review of research articles in the area of behavioral finance. When the investors are hesitant to realize the losses and quick to realize the gains, this phenomenon is known as the disposition effect. This paper explains various theories, which have been evolved over the years that has explained the phenomenon of disposition effect. It includes the behavior of individual investors, institutional investors and mutual fund managers.

Design/methodology/approach – The authors have used the existing literatures from the various authors, who have studied the disposition effect in either real market or the experimental market. This paper includes literature over a period of 40 years, that is, Dyl, 1977, in the form of tax loss selling, to the most recent paper, Surya et al. (2017). Some authors have used the PGR-PLR ratio for calculating the disposition effect in their study. However, some authors have used t-test, ANNOVA, Correlation coefficient, Standard deviation, Regression, etc., as a tool to find the presence of disposition effect.

Findings – The effect of disposition can be changed for different types of individual investors, institutional investors and mutual funds. The individual investors are largely prone to the disposition effect and the demographic variables like age, gender, experience, investor sophistication also impact the occurrence of the disposition effect. On the other side, the institutional investors and mutual funds managers may or may not be affected by the disposition effect.

Practical implications – The skilled understanding of the disposition effect will help the investors, financial institutions and policy-makers to reduce the adverse effect of this bias in the stock market. This paper contributes a detailed explanation of disposition effect and its impacts on the investors. The study of disposition effect has been found to be insufficient in the context of Indian capital market.

Social implications – The investors and society at large can gains insights about causes and influences of disposition effect which will be helpful to create sound investment decisions.

Originality/value – This paper has complied the 11 causes for the occurrence of disposition effect that are found by the different authors. The paper also highlights the impact of the disposition effect in the decision-making of various investors.

Keywords Prospect theory, Mental accounting, Institutional investors, PGR-PLR ratio

Paper type Literature review

1. Introduction
The twentieth century is an era of new theories, new technologies and new philosophies. With the advancement in each area of science, technology, economics, sociology and information processing, some innovative practices have been in trend. Financial theories were also refined into progressive theories like Prospect theory, Dow theory, Short interest
theory, Rational expectations theory, etc., to support the fluctuating trends in the stock market. A requisite to reveal the mysteries underlying the irrational behavior of the investors in the financial market was realized. Despite numerous efforts to link each behavior of the investors’ to the rational and scientific theories of the traditional finance, it failed miserably. This has led to the discovery of a new division of finance, known as behavioral finance.

Behavioral Finance is an interdisciplinary area of finance that combines the principles of psychology, sociology, economics and finance. It explains the impact of the diverse emotional, social and psychological investors’ behavior on the financial decisions of the investors. The principles of the theoretical finance are different from the theories of the behavioral finance. While the classical finance theories focus on the way individuals should behave, the behavioral finance theories study the actual investors’ behavior. The investors behave in an unexpected, sudden, non-unanimous and unpredictable manner. Behavioral finance is currently undergoing a process of enlightening our minds about the functioning of the financial markets and in what way the investors make decisions in the financial market. It explains that the investors face various behavioral anomalies and biases and do not always make rational decisions. So it works to bridge the gap between the actual market behavior and the rational behavior, expected from the investors. Nevertheless, every field of study is not complete in itself, and there is a vast scope of improvements in its existing theories and behavioral finance is one of this.

A revolution for understanding the irrational behavior was originated by Kahneman and Tversky (1979). They played a heroic role by explaining the prospect theory as an alternative to the expected utility theory. According to the expected utility theory, the investors’ selects between uncertain alternatives based on the utility derived from the final wealth. The prospect theory explain that the investors weight the values in terms of gains and losses with some reference point. The prospect theory facilitated other authors to develop various theories of consumer choices and biases like nudge theory, endowment effect, loss aversion, equity premium puzzle, etc. There are some benefits of investors’ irrational behavior; they maximize their profits using mental shortcute/sheuristics, that is, anchoring, representativeness, etc.; it provides liquidity to the stock market; it accelerates dispersion of information in the market and increased profitability to the companies, as they can reap gains from the differences in the investor’s behavior. The irrational investor’s behavior can be detrimental to some investors, as it can result in draining of investors’ profits because of the market crash, uncertainty in the markets, inappropriate losses because of sudden market decline and contradiction of the concept of wealth maximization.

1.1 Disposition effect
Disposition effect is the tendency in the investors to sell the winning investments too early and to hold the losing investments too long. The basic purpose is to maximize the returns while delaying the losses. This is one of the most prominent biases that are exhibited by the investor’s behavior. Its prominence has been accepted by many renowned authors like Shefrin and Statman (1985); Weber and Camerer (1998); Kaustia (2004); Barberis and Xiong (2009) and Cekauskas et al. (2011). The investors are easily prone to this bias, as it relates to their customary decision making in the investment process. Shefrin and Statman (1985) coined the phenomenon of the selling winners and keeping losers as the disposition effect. Initially, some instance of the occurrence of the disposition effect was given by Constantinides (1984). He explained the strategy to realize the gains and the losses in the presence of transaction costs. When the transaction costs are absent, there is no problem in realizing the losses. In case the transaction costs are present, the losses can be realized in a
pattern where it reaches the maximum in the month of December and then faces a significant downfall. This will significantly reduce the tax obligation of the investors.

The theory of disposition effect given by Shefrin and Statman (1985) can be studied into the actual market conditions. It contradicts that the experimental theories are improper in the actual market conditions. They, therefore, proposed a framework for signifying what decisions are actually taken in the real financial markets. They found that though the disposition effect is present in the actual market, its existence is not established in the neoclassical theories of finance. The authors observed that the disposition effect in a way binds the prospect theory and the mental accounting. The basic idea is that the investors apply prospect theory in each mental account after segregating the different investment decisions into different mental accounts. They presented four psychological elements that lead to the disposition effect. Accordingly, the four elements are “prospect theory”, Kahneman and Tversky (1979), “mental accounting”, Thaler (1985), “self-control bias, Shefrin and Statman (1985)” and “regret aversion” Bell (1982) that lead to the disposition effect.

Tax-loss selling take place when the investors sell the capital assets at a capital loss. This will reduce the tax obligation arising from the capital gains realized by other investments. When the capital losses are incurred, it will reduce the final income-tax obligation. Dyl (1977) and Constantinides (1984) have given rational reasons for tax loss selling in December. Dyl (1977) found that there is an increase in the year-end tax-loss selling for the stocks that have declined in value. These abnormal trading volume in the year end is because of the income tax considerations. The stocks showing a substantial decline in prices are liquidated to ensure the benefits of tax loss while paying the taxes at the end of the year. Constantinides (1984) observed that the tax-loss selling is increased from January to December, peaking in December and then substantially reduced in the initial days of January. This indicates towards the increased realization of losses in December to reduce the burden of taxes. With regard to the tax loss selling in the month of December, Shefrin and Statman (1985) have given a different argument contrasting the arguments given Dyl (1977) and Constantinides (1984). Shefrin and Statman (1985) stated that the tendency of tax loss selling is not always a rational behavior. The desire of the investors to realize the tax loss is also derived from the irrational elements like mental accounting, regret aversion and self-control. They found that a significant contribution of the investors involved in the tax-motivated sale and purchase of investments is offset by the tendency of disposition effect. A feeling of self-control is associated with planning the payment of taxes at the year-end. It is easier to arouse the self-motivation in the investors in the month of December compared to other months. December is the deadline for the sale of loss-making securities to warrant tax-deduction in the tax obligations.

The rest of the paper after the introduction is organized in the following form: Section 2 highlights the literature review by explaining the studies of the various authors and their findings regarding the disposition effect, Section 3 shows the existing gaps in the literature, Section 4 shows the methodology used by the various authors to study the phenomenon of disposition effect. Section 5 highlight the findings of the various authors relating to the disposition effect. Section 6 relates to the conclusions drawn from the various authors about the disposition effect. Section 7 is about the future implications which can be carried with regard to the study of disposition effect.

1.2 Reasons for the occurrence of disposition effect
1.2.1 Prospect theory. Kahneman and Tversky (1979) propounded the prospect theory. According to the prospect theory, the investors value their gains and losses with regard to some reference point. The investors are risk-averse in the domain of gains and they are risk
seeking in the domain of losses. This nature of the investors make them to sell the stocks that have increased in value and to hold the stocks that have declined in the value. It means that investors are ready to gamble with the losses. When the investors are faced with a decision-making on either to realize the losses rapidly or to hold the losses with the probability of either attaining a breakeven or to face an additional loss. In this case, the investors are in the domain of losses and so they are willing to take more risks and so, they do not realize the losses immediately. This theory explains that the shape of the value function shows diminishing marginal sensitivity of the investors towards gains and losses. The increase in gains do not add to the overall enjoyment and huge losses do not result in reducing the overall satisfaction. It is shown by the S-shaped curve which is concave in the domain of gains and convex in the domain of losses. Odean (1998) found that the desire of rebalancing the portfolio is not present in the investors. The investors may also resist selling losers as they find the transaction cost of low priced stock is quite high. The rebalancing tendency of portfolios in investors means aligning the weighting of various assets to some desired level. This rebalancing help investors to sell the assets that rise in the value and channelize the returns for buying other assets. When this behavior is controlled in the investors, also winning investment outperform the losing investments. It means that investors sell winners and hold losers. Jiao (2013) focused on the aspect of the risk aversion in the domain of gains and risk seeking behavior in the domain of loss signifying prospect theory as the cause of disposition effect. Prospect theory is the possible explanation which leads to disposition effect, described by the following authors, that is, Odean (1998), Grinblatt and Han (2005); Jiao (2013) and Lucchesi et al. (2015).

1.2.2 Mental accounting. The concept of mental accounting was given by Thaler (1999). The investors have varied preferences for diverse prospect in relation to different financial products. All the decisions are taken according to different mental accounts. This could result in disposition effect (gains or losses) to fulfill the needs of separate mental accounts. The mental accounting shows that investors divide their gambles (investment prospects) into different accounts and gamble with its outcomes, ruling out any chances of interaction among them. Each mental account holds distinct value for the investors. If the investors realize the losses on any of the mental account, then they have to close it at a loss. Thus, it is not possible for the investors (not rational) to sell and finally close any of the mental accounts at a loss. Grinblatt and Han (2005) was motivated by mental accounting for conducting a study to measure the cross-section of stock returns to explain momentum in stock prices. Hur et al. (2010) conducted a study with investors with different mental accounts (high return and low return groups) to find disposition effect induced momentum in the individual investors.

1.2.3 Regret aversion. Shefrin and Statman (1985) conceptualized the idea that the investors usually deter to sell a stock at a loss because of the negative emotions that gets triggered after a losing investment is chosen instead of a winning one. It relates to the feeling arising not only from the monetary compensation but also from the feeling associated with winning or losing a stock. The feeling of regret arises when an investor comes to know that the chosen alternative underperforms the alternative which was not chosen. However, the investor feels proud when the chosen alternative outperforms the other alternatives. The investor always wants to seek pride and to avoid the regret, subsequently leading to the disposition of holding losses and to realize the gains. The feeling of regret and pride is associated with paper losses (loss not realized) or paper gains (gains not realized). A regret is caused not only because of a realized loss but an opportunity forgone that could have performed better. This was also studied by Zuchel (2001) and Tenberge (2009).
Tenberge (2009) found that in the domain of losses, regret has a positive impact on the disposition effect and a negative impact in the domain of gains.

1.2.4 Seeking pride. Shefrin and Statman (1985) explained that there is always some amount of hidden pride in the minds of the investors when they try to gain from the investment. This happens because gain from the investment is directly related to the increment in the pride of the investors. This pride even gets hurt when the winning investment continues to win once they are sold. Following authors describe it in their studies, that is, Muermann and Volkman (2006), Sung (2007) and Tenberge (2009).

1.2.5 Stop losses. The investors can delay selling winners and can avoid the reluctance to hold losers when they are given an option of choosing the stop loss. Following authors have explained it, that is, Kaustia (2004); Feng and Seasholes (2005); Richards et al. (2011) and Fischbacher et al. (2017).

1.2.6 December effect. Shefrin and Statman (1985) explained that the December effect relates to the tax loss selling, which is concentrated in the month of December and it would be beneficial to realize a tax loss in the year-end to avoid further tax obligations. The December effect has been studied by the authors like Odean (1998); Grinblatt and Keloharju (2004) and Boolell-Gunesh et al. (2009).

1.2.7 Overconfidence. Different authors have studied the disposition effect in relation to the overconfidence bias like Liu and Chen (2008); Ben-David and Doukas (2006); Cekauskas et al. (2011) and Parveen (2016). The investors believe that the gains they have been waiting has been realized but there are chances that some securities may rise in value in the future as well. This sense of overconfidence make them to hold the securities for selling them in the future leading to the disposition effect.

1.2.8 Sign realization preference. The investors are indifferent to selling and losing when the results are zero. But when the market moves in a positive direction, the investors are willing to sell the winners and to hold the losers which causes the disposition effect. Ben-David and Hirshleifer (2012) found that the sign realization preference may not affect the trading pattern of the investors and the selling is not increased at the zero profits. This phenomenon has been extensively studied by Ingersoll and Jin (2013); Magnani (2014) and Dai et al. (2016).

1.2.9 Mean reversion. The investors believe that the returns will be centralized around a certain mean value. An increase in the price of a stock leads to an immediate sale fearing that the increased value might be regressed back to the mean value in the future. A fall in the price of a stock gives an assurance that the value of the stock will improve to attain the mean value in the near future. This has been studied by Odean (1998), Zhuel (2001), Da Costa et al. (2008) and Jiao (2013).

1.2.10 Entrapment research. Zuchel (2001) studied that the motivational concept of disposition effect combines the research on entrapment, escalation of commitment and sunk cost. A situation of decision-making under uncertainty arises where the negative returns of the past decisions moves investors into dilemma of continuing with the decision. The same happens with the disposition effect when the investors prefer to hold the losing investment. This is done to justify that their initial purchase (past decisions) was not a fault. The realized losses questions the skills of the investors. So they better hold the losing stocks to justify that the decision to sell the securities remain unclear. The following authors have explained the phenomenon of entrapment in the decision-making, that is, Staw (1981); Brockner (1992) and Zhang and Baumeister (2006).

1.2.11 Social trust. The social trust has the ability to both increase and to mitigate the disposition effect. The proper coordination between the cognitive factors and the social causes can give considerable insights into the framing of proper policies for investment
performance. A common platform for judging the social factors can be used to find their impact on the investment decisions apart from only the cognitive factors. The effect of this relation can be judged because the cognitive and social factors have a high dependency on each other. This was studied by Li et al. (2016) and Heimer (2016).

1.3 The purpose of the study
This paper judiciously captures the essence of the disposition effect by walking through important theories regarding evolvement of the disposition effect. It travels through the theories given by Constantinide (1984), regarding the evidence about some phenomenon of disposition effect, through the studies of Shefrin and Statman (1985), who studied disposition effect from a new perspective of the four behavioral biases namely prospect theory, mental accounting, self-control and regret aversion; further studies were progressed over the years to capture the additional causes that lead to the disposition effect. Barberis and Xiong (2009) contradicted Odean (1998) theory and suggested that investors utility from prospect theory only from realized gains and losses and ignore paper gains and losses. This can be more accurately predict the disposition effect.

The purpose of the paper is to have a meaningful insight into the various causes of the disposition effect which have been explained by various authors overtime. This paper thoroughly complies the various factors and causes. Additionally, it gives the alternative theories contrasting the theories of disposition effect. This paper aims to give a more vigilant explanation and unique causes of the disposition effect. This paper thoroughly complies the various factors and causes that can directly or indirectly affect the investor’s decision to hold losers and sell winners. It is important to understand that the disposition effect is not restricted only to the selling and holding of securities but the studies that implausibly reveal additional causes for the same.

2. Literature review
Odean (1998) tested the disposition effect on 10,000 accounts of a large discount brokerage house from a time period from 1987 to 1993. He was the pioneer author who explained the formula for the disposition effect using the individual investors trading accounts in the US markets. He found the ratio of PGR and PLR while taking into account the stock’s entire portion of stock and ignoring the partial sales of the stock. He dismissing the intention of rebalancing the portfolios. The ratio of PGR to PLR declines from 1.21 to 0.85 from January to December. This points towards the tax-loss motivated selling in December. The author computed the paper gains and paper losses by comparing the selling price of the stock (either high or low) to its average selling price. If both high and low price of the day is greater than its average purchase price, then it is considered as a paper gain. The paper loss occurs if the purchase price is higher than the average high and low value of the stock. He concluded that the investors are quick to realize gains as to the losses. The disposition effect not only tells that people realize more gains than losses but they also indicate reference price used to calculate the gains or losses. The study by Lakonishok and Smidt (1986) found that the winners are sold and losers are held with the aim of rebalancing the portfolio. Indeed, after removing the partial sales from the stock, the tax loss selling in December shows an increase. Interestingly, the economic significance of disposition effect is very favorable for the individual investors.

Kaustia (2004) studied the trading volume of US IPO over the period of 17 years, 1980-1996. He tests the presence of disposition effect in view of the IPO trading volume. The paper discusses the importance of the reference point to study the IPO trading in the stock market. The author considers the total return (dividends, capital gains and stock splits)
since the IPO issue to be a significant reference price. The offer price of the IPO should be seen as the reference point, such that when the IPO with a negative initial return exceeds the offered trade the trading volume is significantly increased. It is evident that the disposition effect is considered to be significant if it has an impact on the trading volume. The paper also tells that not necessarily, the purchase price is the reference price for any IPO. The IPO's whose prices start falling once it rises initially are prone to sell their shares immediately to avoid losses from further fall in prices. The prices at this point are slightly above the offer prices. But unluckily, if the prices fall below the offer prices, then the investors are faced with the dilemma, as they neither want to face immediate losses now nor in the future. The investors use stop losses to avoid this dilemma, as it sets the triggers level around the offer price even if the trading that day is done below the offer price. Thus, when the prices of the IPO's are higher than the offer prices, the trading volume increases. The trading volume also increases when the market price of the shares fall below the offer price for the very first time. Thus, it does not make clear the occurrence of disposition effect.

It was interesting to note that when Chen et al. (2007) studied the existence of various biases in the Chinese and US investors, they showed different behavior with regard to different biases but were at par with the disposition effect. Furthermore, the inclination of the disposition effect is more in the individual than as shown by institutional investors. Authors have found that Chinese investors are more prone to disposition effect than the US investors. This is an exploratory study identifying the multi-bias relationship among various biases, that is, disposition effect, over confident and a representativeness bias. He concluded that inexperienced investors are less prone to the behavioral biases. Moreover, the inclination of the disposition effect is more in individual investors as compared to the institutional investors. Thus, the investors in emerging countries like China exhibit more behavioral biases than that of the investors in nations like USA.

Goetzmann and Massa (2008) studied the effect of disposition effect on the return, risk, volatility and return of that asset. The interesting part is that when the investors show a tendency of the disposition effect then the return, volume and volatility of the stock’s decline. Barberis and Xiong (2009) used PGR–PLR ratio to predict that the disposition effect is present only in some cases and fails when the PGR is less than the PLR. It does not exist when the number of trading periods is low and the return of the risky returns is high. Another cause for the disposition effect comes from the realization of utility. They described that the investors compare the utility of the gains and losses and that they prefer the utility of the gains to the utility of the losses. The belief in mean reversion behavior of the investors is the major cause of the disposition effect. If the differences between PGR and PLR is positive, then it shows a positive disposition effect. The disposition gives rise to the momentum effect and other biases like overconfidence, the prospective trading volume can lead to the disposition effect. Hur et al. (2010) stated that the reason for the stock market anomaly is the existence of several biases and not only the risk preferences of the investors. The stocks which have a greater participation of the individual investors have an edge towards the momentum. Fairly, Linainmaa (2010) showed that the use of limit order can give an impression of the disposition effect’s limit. A limit order is an order placed by the customer that directs the other party the right to sell or buy or buy a particular share if the security reaches a certain price. Hur et al. (2010) have explained the market anomaly based behavioral bias as the disposition effect. This, in turn, is a combination of the prospect theory and mental accounting. The effect of the disposition effect to predict future stock has a direct impact on the investor population who are exposed to these effects. The more the presence of individual investors in the market, the more is the presence of disposition effect, especially on hard to value stocks. The disposition is studied from the perspective of the
individual investors because of their behavioral bias. Kaustia (2010) finds that the prospect theory can be used to predict disposition effect but along with certain assumptions. The author finds that the likelihood of selling a stock is greatest at the point where the current price and the purchase price of the stock is same. The willingness to sell a stock decreases when the price either increases or decreases relative to the purchase price. The gain realized by selling the stock in the range of 0-30 per cent will not result in a higher utility for selling as compared to holding the stocks. The paper even rejects the idea of mean reversion in case of losing stocks. When the capital losses are realized, the tendency to sell both underperforming and outperforming stock is greatly reduced.

The goal system theory can be used to reduce the intensity of the disposition effect. Cekauskas et al. (2011) calculated the PGR–PLR ratio on each security and then aggregated the values to find the significance of the difference between the two ratios. If the PGR ratio exceeds the PLR ratio, then it shows the existence of the disposition effect. This method assumes the independence of each account and each transaction. The second approach would be to compare the PLR and PGR for each investor, aggregating these values and then to compare the values to find the existence of disposition effect. This method does not assume the independence of each transaction across various accounts. Kaustia (2011) found that the disposition effect may also have an impact on the changing pattern of trading volume in the market and has an effect on the stock market under-reactions which ultimately leads to a momentum in the share prices. The investors can lose substantial part of their investment if they irrationally sell the stock and have to bear the burden of the increased capital gain tax. He summarized the various causes of the disposition effect in various types of investors and their possible implications such as trading volume, asset pricing, real estate market and welfare costs. Chhabra and De (2012) showed the records on the actual cost and the opportunity cost of selling and buying securities. The disposition to sell stocks is higher than the disposition to repurchase the stocks. Thus, the investor is more prone to losses from the disposition to sell than the disposition to buy. Thus, the investors give more importance to the actual cost than to the opportunity cost of selling or buying a particular security. Cici (2012) used PLR–PGR ratio to find the extent to which the mutual fund managers are exposed to the disposition effect. The funds which are prone to the disposition effect realize more gains than loses. This difference is addressed as the disposition spread. Jiao (2013) found the mean reversion behavior of the stock market as the cause of these disposition effect. Several theories had tried to explain the disposition effect with the help of rationalizing the neo-classical theories of investment decisions. The disposition effect can be explained with the help of prospect theory through the assumption of loss aversion and asymmetric risk attitudes.

Woo and Pollack (2014) found that yet another way of finding the disposition effect is the capital gains overhang. This is the difference between the current price of the stock and the price at which those shares were purchased by the shareholders currently holding them. The disposition effect might be a reason for the momentum in the stock (a situation that the current prices will continue to exist in the market). The disposition effect is, in fact, is the result of the mental accounting and the prospect theory. It means that the investors value the gains and losses with the regard to the average price of the shares. Capital gain overhang is the difference between the current prices from the average price that the investor expects as a function of the current price of the share in the market. This average price is the weighted average of the price of securities held at the beginning of the purchase. Frino et al. (2015) studied how the multi-culture and their ethnicity can impact the trading behaviour of various categories of investors. The society wherein multi-culture is intertwined, studying the Chinese investors in those Australian market was the primary...
The disposition effect is prevalent in some categories of investors like women, aged people investors with undiversified portfolio, investors investing in stocks with a lower value, etc. Aren et al. (2016) have evaluated published institutional investors research in recognized journals. He concluded that the important determinants of disposition effect are the investor experience and overconfidence. Overall, institutional investors are less prone to the disposition effect.

Richards et al. (2011) found that the stop losses can be used to reduce the impact of disposition effect. This is done in two ways, one through ordinary stop loss and the second with the tracking stop loss. The former reduces the reluctance to sell losses and the latter one is to reduce the eagerness to sell gains. The investor sophistication like the knowledge about the various investment alternatives as well as experience gained in the financial market also reduces the disposition effect.

Toma (2015) also found that the investors are prone to disposition effect at the individual level and not at the portfolio level. This shows the application of both the mental accounting and prospect theory. Bodnaruk and Simonov (2015) studied the existence of disposition effect in the mutual fund managers by comparing the difference between the PGRit and PLRit. PGRit is the ratio of the winning stocks with realized gains to the total number of winning stocks. PLRit is the ratio of the losing stocks with realized losses to the total number of losing stocks. This value is compared with the Fama-French World Index. The stock is considered as a winning stock if it gives a return higher than this index and a losing stock if the value of Fama-French World Index is higher than the value of the stock. Li et al. (2016) found that apart from the cognitive bias, another significant factor which affects the disposition effect in the mutual fund investors is the social norms. It says that the social bonds of the individual have a lasting impact on the investors, as they are motivated by a higher performance. The increased fund performance sensitivity ultimately make the investors to sell the winners and to hold the losers. The lower fund performance sensitivity arises because investors do not bother much about the poor performance of the funds and they are more focused to explore more the unexplored funds. The social trust is an interesting fact that can be focused to study disposition effect. A one percent increase in the social trust can have an impact on the mutual fund flow sensitivity up to a level of 59 per cent. The trust induced flow may reduce the disposition effect. Another interesting conclusion is that the immigrants to the other countries bring with them some sort of social trust which is enough to induce the disposition effect. It adds to the fact the effect of this culture-related bias may have a different impact on the loss and gainful outcomes. These all characteristic of disposition effect is more present in the individual investors than in the institutional investors. The country-specific social norms have a different impact on the trading behavior of investors.

Surya et al. (2017) explained the disposition effect with the help of the regulatory focus theory. This theory categorizes the investors between the prevention group and promotion group. The disposition effect can be explained from the perspective of the prospect theory. Some authors are of the view point that it is not so that the prospect theory cannot explain the disposition effect. But the reason is that the prospect theory cannot be used to explain the loss aversion in the initial investment. The regret theory can better explain the disposition effect in the investors. They can make an informed decision when they have the information about the post decisions options. The disposition effect arises because investors have an urge to avoid the feeling of regret in the decision-making.

The disposition effect has been studied across various categories of investors by different authors, mutual funds by Scherbina and Jin (2005), Xu (2007); Ammann et al. (2011); Li et al. (2016); Cici (2010), individual investors by Feng and Seasholes (2005);
Barberis and Xiong (2009); Hur et al. (2010); Cekauskas et al. (2011); Jiao (2013); household investors by Calvet et al. (2009); Kaustia (2011); Nygaard (2011); Firth (2015), institutional investors by Teo and O’Connell (2003), Annaert et al. (2008), O’Connell and Teo (2009); Croonenbroeck and Matkovskyy (2013) and Lucchesi et al. (2015). Some authors, that is, Odean (1998); Zhuel (2001); Da Costa et al. (2008) and Jiao (2013), believe that the occurrence of the disposition effect is because of a belief of the investors regarding the mean-reverting behavior of the financial markets. The participants having the basic knowledge of statistics sell winners but hold only a few losers.

2.1 Demographic variables and disposition effect

Feng and Seasholes (2005) state that the demographic variables like investors’ sophistication and trading experience reduces the tendency to realize gains and losses in the investors. The results reveal that together both these variables have a propensity to reduce the reluctance to realize losses and reduce the propensity to realize gains by 37 per cent. This characteristic of the investor works only for the trading behavior and not the investing behavior. Da Costa et al. (2008) found that gender of the investors interferes with the disposition effect. The male and female investors have different reference points according to the purchase price. The females are prone to sell the winner and not to hold the losers when their reference point shifts to recent price from the purchase price. Richards et al. (2011) gave a probable solution to the problem of inventors' sophistication in the form of stop losses like social trust. The disposition effect is common with investors having certain characteristics. These are investor sophistication, type of traders (day traders), demographic variables, age and experience.

Aspara and Hoffmann (2015) showed the presence of disposition presents in both the experimental setting and the actual data. This bias could have an adverse wealth consequence. This result verifies the findings given by Odean (1998). Furthermore, mere talking about the existence of the bias cannot verify the solution unless suitable solutions are framed for reduction of its possible consequences. The goal system gives an interesting depiction that after the attainment of a particular goal, the individuals invest a lesser amount of efforts for future goals, as they become assured of their success and vice versa. The same happens with the disposition effect. The returns which give increasing returns in the past no longer serve as the motivating factors and they are sold off. The investment which remains less profitable in the past holds on to gain the benefit by selling those securities in the future. The subordinate saving goal can be approached to reduce the sensitivity of the investors towards the losses and to take an intelligent approach while planning for their investment. It shows that the socio-demographic factors have a substantial impact on the investment decisions of holding or selling stock. Thus, the goal system theory can be easily applied in the financial investment decisions. The lab experiments suffer from the drawback that they are performed in a controlled setting which might not be applicable in the real market conditions. Li et al. (2016) found that the level of social trust among the mutual fund managers can help to reduce the disposition effect. The psychographic and demographic variables have some impact on reversing the occurrence of disposition effect.

2.2 Alternative theories to the disposition effect

- Weber and Camerer (1998) considered an experimental setting to test the effect of reflection test and reference points causing the disposition effect. They asserted that the conclusions drawn from the real market data might not be true, as the actual expectations of the investors cannot be drawn from these markets. However, the
experimental test is a direct test to show the investors' trading decisions according to the prices at which they are traded. Losing stock is held, as the pain of a further loss is far less than the pleasure from recovering the security price.

- Zhuel (2001) gave an alternative reason (motivational factors) of the disposition effect apart from the prospect theory. He marked the reason for the occurrence of disposition effect need to be found out, as there is enough evidence for us to understand that disposition effect exists in the investment decisions. The reasons could help to find out the ways that could reduce the impact of the disposition effect. He focused on the involvement of the motivational factors like belief in mean reversion, escalation of commitment as the probable causes of the disposition effect.

- Lehenkari (2009) examined the existence of the phenomenon of disposition effect in the bear market. When the prices in the market are compulsorily falling, the investors cannot realize gains even if they want to. Their liquidity needs made them realize losses which acts as a resistance to the disposition effect. He suggested two alternative theories as for the reasons for the disposition effect. These are mean reversion and escalation of commitment. The results also found that the disposition effect results in the value-addition to the portfolio and holding losers give the investors more return than holding winners.

- Barberis and Xiong (2009) gave a different perspective to look at the decision-making in the prospect theory. They gave a preference based explanation for the same. They found that the people are prone to behave opposite to the disposition effect, while they take trading decisions. The investors want to attain a risk-return trade-off and want to breakeven on their gains and losses. If they always fear of losses, then they will never have the courage to buy any securities. So, whenever he faces a certain amount of probability of returns in the future on some stocks, he seeks the equal amount of risk by investing in some securities to the extent of probable gains, thus setting off his risk by an equal amount of profit. They credited the phenomenon of disposition effect to the realization utility. Realization utility is the linear function of a utility and a positive time discount rate.

- Meng and Weng (2017) rightly said that reference is an important element in determining the realization of gains and losses. It has a significant impact on the trading behavior of the investors. Thus, while the prospect theory found final wealth as the reference point, they have assumed expectations-based reference point which can be anything greater or lesser than the initial wealth.

3. Research gap in the existing literature
The implied definition of the disposition effect seizes itself only with the decision taken on the gains and losses in view of rise and fall in the prices of securities. But the actual scenarios in the stock market differs significantly. In fact, the factors influencing investors is different for different categories of investors. The individual investors, institutional investors and the mutual funds behave differently in response to the disposition effect. It is highly critical to know the different factors impacting different investors. The mutual funds are less effected from the disposition effect than other categories of investors. The more diversified the investor's portfolio, lesser is their inclination towards disposition effect. The longer the interval of time, the investors hold the winning stock greater can be the possibility of reducing the losses arising from
the disposition effect. The time period of study of the disposition effect can substantially vary the occurrence of disposition effect. Similarly, when studied among different markets, the disposition effect shows diversified results. The inter-market differences among the economies of the various countries exhibit diverse response to the disposition effect.

Duan and Zhou (2008) found that the investors' trading activities in China stock market are affected by overconfidence and disposition effect. The effect of these cognitive errors on the disposition effect can be studied in the context of other developing countries. Sung (2007) studied the impact of pride and regret on the disposition effect in contrast to the momentum trading strategy. The momentum trading strategy is optimal for the investors. This contrast can be studied in view of the other bias like overconfidence, anchoring, home bias, anchoring, etc. Da Costa et al. (2008) studied the impact of gender on the disposition to buy or sell. This study can be carried out with the other factors like market factors and motivational factors that can increase or decrease the disposition effect. Cici (2012) studied the effect of disposition effect on US mutual funds is the reduction in betas, with no significant impact on the disposition effect. The further extension of the findings can be studying the impact of the combined effects of the various mutual fund managers' decisions on the portfolio management decisions and how it leads to the disposition effect. Kadous et al. (2014) studied the effect of gender, price change and investor status on the disposition effect in an experimental setting. This study can be further refined to study the impact of additional investor characteristics like education, experience, profession, income, etc., on the disposition effect.

4. Research methodology

4.1 Research objectives
The objectives of this research are as follows:

- to understand the disposition effect and its impacts on the investors' decisions;
- to highlight the causes of the disposition effect in the experimental situations and in the real market;
- to identify the disposition effect in various types of investors like individual investors, institutional investors and mutual funds; we recommend them to draft their own strategies and techniques to reduce the velocity of disposition effect, etc;
- to identify the impact of cognitive biases, that is, mental accounting, overconfidence, regret aversion, etc., with the disposition effect;
- to indicate the impact of disposition effect on the volatility, return and risk of financial markets and IPOs;
- to study the Proportion of Gains Realized (PGR) and Proportion of Loss Realized (PLR) ratio for calculating the disposition effect;
- to compile the literatures of various authors in respect of growing theories of disposition effect;
- to sum up some impact of disposition effect on the investor's choices like tax planning, future sale and purchase of stocks, diversification of portfolio, etc.; and
- to add to the existing knowledge of the stock brokers, investment advisors, investment managers, portfolio managers about the circumstances under which their clients can be exposed to the disposition effect.
4.2 Research tools and techniques

This paper includes the literature on disposition effect obtained from Emerald, EBSCOhost, SSRN and Google Scholar. We include the theories, models, arguments, reasons, etc., given by different authors’ over time to establish the existence of disposition effect. This study includes the very first literature on disposition effect given by Dyl (1977) to the most recent paper by Surya et al. (2017).

Most of the study conducted to find the disposition effect is carried out using either experimental studies or using the secondary data. Standard deviation is used by the following authors, that is, Barberis and Xiong (2009); Hur et al. (2010); Kadous et al. (2014); Li et al. (2016) and Heimer et al. (2016). Mean, median is applied by Magnani (2013), Kadous et al. (2014); Heimer et al. (2016) and Li et al. (2016) and few authors have tested survival analysis methods to identify the occurrence of disposition effect, that is, Feng and Seasholes (2005); Guler (2007); Chen et al. (2007); Richards et al. (2011); Chhabra and De (2012); Chen et al. (2007) used survival analysis to test the duration of holding stocks by the investors to check the disposition effect. Survival analysis is easy to interpret and the data are also found on those days when the investor does not buy or sell out any securities.

The coefficient of correlation is used to check the relationship between independent variables and the disposition effect, that is, Cekauskas et al. (2011); Woo and Pollack (2014) and Li et al. (2016). Kolmogorov–Smirnov tests is applied by the several authors, that is, Fischbacher et al. (2017), Weber and Camerer (1998), to compare probability distribution across subjects in an experimental study; Jiao (2013) used it to find the belief in mean reversion is different in case of either gains or losses. However, Regression is used by Feng and Seasholes (2005); Hur et al. (2010); Richards et al. (2011); Jiao (2013) and Heimer (2016). Two-way ANOVA is used by Aspara and Hoffmann (2015). Linear regression is applied by Woo and Pollack (2014).

Logit regression is used by the several authors, that is, Feng and Seasholes (2005); Lucchesi et al. (2015) and Cici (2010) to find different selling propensities of the investors in response to the gains and losses. VAR coefficient is applied by Duan and Shou (2008) and Liu and Chen (2008). The t-test is used by Weber and Camerer (1998) and Duan and Shou (2008). Chi-square test is used by Kadous et al. (2014), who performed this test to know the association between investor characteristics like investor status, gender and price change. Z test is applied by Da Costa et al. (2008) and Feng and Seasholes (2005). Wilcoxon z-stat is used by Kadous et al. (2014).

4.3 The formula for calculating disposition effect

The formula to calculate the disposition effect (Odean, 1998) is the ratio of the proportion of gains realized (PGR) to the proportion of loss realized (PLR):

\[
PGR = \frac{\text{Realised Gains}}{(\text{Realised gains} + \text{Paper Gains})}
\]

\[
PLR = \frac{\text{Realised Loss}}{(\text{Realised Loss} + \text{Paper Loss})}
\]

Realized gains = These are the realized profit when the shares are actually sold for profit.
Realized Loss = The actual losses incurred on selling the shares at a loss.
Paper Gains = The gains which the investor would have realized if they would have sold the shares that increase in value.
Paper losses = The unrealized loss that the investors may have recognized if the stocks would have been sold at a loss. The disposition effect occurs when the PGR > PLR. The worth of finding the values of PGR and PLR is increased when the value is computed across several accounts relative to each other rather than measuring them individually.

5. Results and findings
The findings signify that the individual investors are largely prone to the disposition effect and the demographic variables like age, gender and experience, and investor sophistication also impact the occurrence of the disposition effect. On the other side, the institutional investors and mutual funds managers may or may not be affected by the disposition effect. The investors attain sufficient control over their decisions to control losses and to realize the gains. The great majority of the study were based on the developed markets, especially those of USA and Europe, and a little concern was given to the less developed nations. The study of disposition effect is predominant in the countries like the USA, UK, China and European Union. The investors can sometimes behave opposite to the disposition effect. The investors can assume an equal amount of risk of reduction of returns when the returns on their investments indicate probable gains. The reference point with which the investors compare their gains and losses is a significant determining point for investment decisions. This reference point can be either the offer price, purchase price, average price, expectation-based price or the current price. Tax planning is also a significant reason which increases the tendency of the disposition effect. The cognitive biases like overconfidence, regret aversion, mental accounting, etc., also play a significant role in impacting the behavior of investors towards gains and losses. Apart from this, the market’s behavior like volume, volatility, mean reverting behavior of market returns, etc., can also change the preference of investors towards certain securities.

Odean and Zhu revealed that the presence of the disposition effect makes the investors show the coordinated trading which eventually leads to an impact on the asset pricing. Grinblatt and Han (2005) found that the more the investors are faced with the disposition effect, the more they become less sensitive to the price changes in the market and, thus, will give lesser returns. William (2008) found that with an increase in the disposition effect, the return, volume and volatility of the stock declines. Lehenkari (2009) found that the disposition effect is common for those stocks that the investors have personally purchased against those which have been inherited from the ancestors or gifted to them by someone else. Hur et al. (2010) and Kaustia (2011) state that increase in the disposition effect leads to an increase in the momentum of the stock market. The experiments can be performed by taking either of the selling decisions or the buying decisions of the individuals. This is because, when faced with too much of the investment decisions, the investors may not be able to take proper decisions and the focus cannot be given to one aspect of the decision-making. Barber et al. (2011) found that the increase in the disposition effect results in an increase in the tax liability of the investors. This liability can be reduced by reversing the disposition effect and selling a losing investment. Thus, a low after-tax return is earned by the investors.

The implied definition of the disposition effect seizes itself only with the decision taken on the gains and losses in view of rise and fall in the prices of securities. But the actual scenarios in the stock market differs significantly. In fact, the factors influencing investors is different for different categories of investors. The individual investors, institutional investors and the mutual funds behave differently in response to the disposition effect. It is
highly critical to know the different factors impacting different investors. The mutual funds are less effected from the disposition effect than other categories of investors. The more diversified the investor’s portfolio, lesser is their inclination towards disposition effect. The longer the interval of time, the investors hold the winning stock greater can be the possibility of reducing the losses arising from the disposition effect. The time period of study of the disposition effect can substantially vary the occurrence of disposition effect. Similarly, when studied among different markets, the disposition effect shows diversified results. The inter-market differences among the economies of the various countries exhibit diverse response to the disposition effect (Figures 1 and 2).

6. Conclusions
It is concluded that the disposition effect is caused because of a variety of factors like prospect theory, mental accounting, overconfidence, regret aversion, tax-motivated selling, etc. Different investors are faced with different amount of disposition effect based on their respective demographic characteristics. By attaining a high level of the understanding of the financial markets, the investors can acquaint themselves with the probable effects of the financial decisions and reduce it appropriately. This requires a conscious decision both on the part of the individual investors, the institutional investors and the mutual funds. The actual market

Figure 1. Causes of disposition effect studied by different authors

Source: Compiled by the author

Figure 2. Various impacts of disposition effect given by different authors

Source: Compiled by the author
conditions are far different from the ideal market conditions. A reduction in the disposition effect can potentially reduce the uneven changes in the equity prices and can enhance the efficiency of the stock market. Though, only seeking knowledge of the disposition effect alone cannot reduce its effects completely, but it can help to reduce its potential effects which might arise in the future. This is a rapid indication for all the investors to be well-coordinated and balanced before investing in any security. The requisite consideration of the disposition effect can be put to use while taking investment decisions in the stock markets. The solutions to the behavioral puzzles can be found out properly if the changes in the stock markets are viewed from a wider perspective. This could desirably have positive implications in the long run.

7. Future implications
The society and the investors at large are highly impacted by the disposition effect. The investors, being an imperative part of the society, are highly influenced by the social norms, social interactions, social groups and social belongingness which ultimately increases their inclination towards the disposition effect. In light of these factors, the financial advisors and the issuing companies should identify the various characteristics of the investors before offering any security in the stock market. The differences in gender, relative differences among investors, the exposure to the international markets, extent of the domestic investor’s participation in the international markets, the long-term and short-term objectives of the investors, the occurrence of behavioural biases like overconfidence, mental accounting, etc., are some of the important determinants that can affect the impact of the disposition effect among investors. It is possible that the securities that the investors sell might continue to increase in value which may reduce their gains. Similarly, the losing stocks which they hold continue to fall in value leading to subsequent losses. The study becomes extensively for teaching purposes and aiding academia, public policy and research for more comprehensive study of the disposition effect. The paper also summarizes the various methodology which has been given by various authors to study the existence of disposition effect. The various theories evolved over the period of time helps to get a clear picture of the occurrence of disposition effect. The issuers of the securities and the companies can predict the risk and return behaviour of the investors before issuing any security in the stock market. This helps to predict the response of the investors in regard to the issue.

The researchers who want to study and understand about the disposition effect can refer to this paper, as it gives a comprehensive background of the existence of disposition effect. The investors become well versed with the various reasons that increases the disposition effect. This is essential for making strategies about the stock return and investing pattern in the long run. To the best of our knowledge, this paper is the first in itself that has compiled the above-mentioned 11 reasons for the occurrence of disposition effect. It gives a vivid picture to the reader to enhance his understanding of the theories of disposition effect and, also, some alternative reasons which question the existence of disposition effect in the actual stock market.

The other behavioral biases, that is, herding, house money effect, anchoring and gambler’s fallacy causing the disposition effect, can be identified apart from the overconfidence, regret aversion, etc. The relative comparisons of the disposition effect across developed and developing countries can give an idea about the rapidity of its occurrence in either of the two economies. The study can be conducted to enhance the knowledge of the demographic variables, that is, education, income, profession, etc., causing the disposition effect. This study can help to focus on the identified variables if they have the propensity to reduce disposition effect and to eliminate its occurrence if they are likely to enhance the tendency of the disposition effect. Further studies can be conducted by taking the actual behavior of the investors as the
dependent variable to measure the disposition effect. A significant study is desired in the developing countries like India, as their economy is prone to the misfortunes arising out of the impacts, that is, volatility in the stock market, mispricing of the securities, etc., of the disposition effect. There is dearth of findings of the entrapment research and its impact on the disposition effect. This area can be highly focused.

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Further reading


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