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Artículos

Do Accounting and Finance Master?s Students Apply Prospect Theory? *

¿Aplican los estudiantes de maestría en contabilidad y finanzas la teoría de la perspectiva?

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Abstract: This study aims to question the assumptions of prospect theory using a sample of students enrolled in a master?s course on accounting and finance at a Portuguese polytechnic institution. Such theory has stood out among others developed in the field of Behavioural Finance due to the debate and investigation it has generated. To achieve this aim, we applied a questionnaire four consecutive years (2012?2015). The instrument included a set of alternative response questions that seek to unveil respondents? preferences regarding the situations they were presented with. Bibliographic and descriptive research was carried out and the results were compared with those obtained by other authors but they were not always consistent. Thus, the isolation effect was confirmed; the reflection effect was almost always confirmed; and the certainty effect was not always confirmed. Regarding attitude toward risk, the assumptions of risk aversion, and importance given to changes in wealth (at the expense of wealth states), our results are in line with those obtained by said authors. Hence, this study contributes to support prospect theory with its results and the confirmation of the isolation effect.

Keywords: Traditional finance, modern finance, behavioural finance, prospect theory, JEL Classification: D81, C52, G10.

Resumen: El objetivo de este estudio es verificar los supuestos de la teoría de la perspectiva en una muestra compuesta por estudiantes que asistieron a un curso de maestría en contabilidad y finanzas en una institución politécnica en Portugal. Esta teoría se ha destacado entre otras desarrolladas en el campo de las finanzas conductuales por el debate y la investigación que ha generado. Para lograr el objetivo mencionado, adaptamos el cuestionario de los autores de la teoría de la perspectiva. El cuestionario se aplicó cuatro años consecutivos (de 2012 a 2015) e incluyó un conjunto de preguntas de respuesta alternativa que buscan conocer las preferencias de los encuestados frente a las situaciones que se exponen. También se realizó una investigación bibliográfica y descriptiva y se compararon los resultados con los obtenidos por otros autores. Los resultados no siempre fueron consistentes con los de dichos autores. Se verificó el efecto de aislamiento, el efecto de reflexión (casi siempre) y el efecto de certeza (no siempre). Adicionalmente, en cuanto a la actitud hacia el riesgo, los supuestos de aversión al riesgo y la importancia dada a los cambios en la riqueza (a expensas de estados de riqueza), nuestros resultados están en la misma línea que los de tales autores. Con estos últimos resultados y la confirmación del efecto de aislamiento, este estudio hace una contribución a la teoría de la perspectiva.

Palabras clave: finanzas tradicionales, finanzas modernas, finanzas conductuales, teoría de la perspectiva, Clasificación JEL: D81, C52, G10.

1. INTRODUCTION

The emergence of Traditional Finance seems to be prior to the middle of the 20th century. An early milestone in modern finance (or classical finance) was 1952, when Markowitz introduced the portfolio selection theory; later, Behavioural Finance was established in 1979 with Kahneman and Tversky?s prospect theory (Kleinübing Godoi et al., 2005; De Bondt et al., 2008).

Kleinübing Godoi et al., (2005) argued that Behavioural Finance extended the scope of financial theory. They defended the importance of consolidating a theory which might include psychological factors that were previously excluded from Traditional Finance models. They maintained that Behavioural Finance concepts about human nature are supported by psychoanalytic theory, the ground-breaking approach by Freud that departed from the Rationalist view established since Descartes. Psychoanalysis showed that individuals are divided into conscious and unconscious systems, in which reason becomes only a superficial effect. Furthermore, Behavioural Finance also disputes the propositions of modern finance: agent behaviour and market rationality. The latter proposition, according to Joo and Durri (2015) and in line with Behavioural Finance, hinders the understanding of various financial phenomena.

In Shefrin?s words (2015), ?The behavioural revolution imported ideas from behavioural psychology into finance, and replaced the rationality postulate with a more realistic alternative ? human beings are not perfectly rational? (p.95). Prospect theory is an alternative to the model of decision making under risk conditions of the expected utility theory, and it assigns values to gains and losses instead of final results. According to Abdellaoui et al., (2013), prospect theory ?is increasingly used to explain deviations from the traditional paradigm of rational agents? (p.411).

Thus, the aim of the present study is to verify the assumptions of prospect theory in a group of students enrolled in a master?s program in accounting and finance. For that purpose, bibliographical and descriptive research was conducted. We adopted Kahneman and Tversky?s questionnaire (1979) and expected the results to confirm the assumptions mentioned above. This study is justified as it might be considered a new instrument for deepening the knowledge in this field in Portugal or, at least, a pedagogical tool.

This paper is organized as follows. Section 2 describes the evolution of finance in relation to its main paradigms, highlighting the role of behavioural finance and, particularly, the importance and development of prospect theory. Section 3 details the methodology. Section 4 presents the results, which are discussed in Section 5. Finally, Section 6 outlines some conclusions, limitations of the study, and possible future research lines.

2. THEORETICAL FRAMEWORK

Evolution of finance

In the evolution of finance as a science, the literature refers to three major paradigms: Traditional Finance, Modern Finance (Philippon & Reshef, 2013), and Behavioural Finance (Subrahmanyam, 2008). Each one is based on its corresponding theory. Traditional Finance theory, represented by the Technical school (Dow, 1894; Hamilton, 1922; Rhea, 1932) and by the Fundamental school (Dodd & Graham, 1996; Loeb, 1935), was primarily focused on earning above-average market returns. However, it presented limitations; for example, the fact that the past, eventually, cannot be repeated in the future; or that there is no proof that it is possible, in a sustained manner, to obtain returns higher than market returns, as this theory claimed. Moreover, according to Thaler (1999), Traditional Finance did not reflect people?s actual behaviour when making investment decisions with respect to the volume of transactions, the volatility and predictability of prices, the profitability of shares, and the payment of dividends by the companies.

The Modern Finance paradigm contradicted the traditional one in the sense that it recommended to investors not to seek to obtain returns higher than market returns, but equal to those returns or consistent with their risk profile (Ardalan, 2018). According to Thaler (1999), modern economic-financial theory is based on the assumption that ? representative agents? (p. 12). In the economy are rational in two ways: they make decisions according to the axioms of expected utility theory and produce unbiased forecasts. Tversky and Kahneman (1992)maintain that this ?theory reigned for decades as the dominant normative and descriptive model of decision making under conditions of uncertainty?. It is based on the following key elements:

> A value function that is concave for gains, convex for losses and steeper to losses than to gains;
>
> A nonlinear transformation of the probability scale that overweights small probabilities and underweights moderate and high probabilities (p. 297-298).

However, this theory has been recently questioned and, nowadays, there is a ?general agreement that the expected utility theory does not provide an adequate description of the individual decision? (Tversky & Kahneman, 1992, p. 297). Haugen (2000) argues that Modern Finance is essentially based on four pillars:

- Portfolio theory: In his portfolio selection theory, Markowitz (1952) departs from the premises of investor rationality, the need for diversification (not an in naïve manner), and the impossibility of consistently obtaining a higher return than the market?s.
- Theorem of dividend irrelevance: Miller and Modigliani (1961) argued that dividend policy is irrelevant because its swift does not produce any change in company value.

- Capital Asset Pricing Model (CAPM): Sharpe?s (1963, 1964) basic principle was the consideration that a stock?s expected return [E (Ri)] is proportional to market risk (bi). This is generally represented by the expression E(Ri) = Rf + b (Rm - Rf). Thus, according to this model, investors may legitimately expect, from their investment in stocks, the corresponding rate of return of a risk-free investment (Rf) plus the remuneration for the risk component, which is a function of the market (systematic risk). According to Barberis (2013), the CAPM assumes, among other aspects, that investors assess risks according to expected utility theory.
- Efficient market theory: Fama (1970) established the following conditions for market efficiency to occur: lack of transaction costs, availability of all information at no cost to all market participants, and existence of total agreement regarding the effects of the information on the current prices of assets, as well as on their future distributions (homogeneous expectations). Shiller (2003) considers that the efficient market theory had its heyday in academic circles around the 1970s while, to Stout (2003), it was in the 1970s and early 1980s that this theory ?became one of the most widely-accepted and influential ideas of finance economics? (p. 635).

Kleinübing Godoi et al., (2005) maintain that, in the efficient market theory, the capital market is an efficient information processing machine, investors act rationally, and stock prices reflect any information that people have about fundamental variables (e.g., current and future income). Such prices change with the news but do not include mass psychology. Said authors claim that, since the 1980s, studies by Fama and French (1998), Lo and MacKinlay (1988), and French and Roll (1986) found significant correlations between current and past returns, which provided conflicting evidence pointing to the random walk. However, Fama (1998) argued that these anomalies, because they occurred in a random way, compensated each other and were consistent with market efficiency; in turn, Shiller (2003) found flaws in the efficient market theory for two reasons:

> The anomalies that were discovered tended to appear to be as often underreaction by investors as overreaction; and
>
> The anomalies tended to disappear, either as time passed or as methodology of the studies improved. (p. 101).

Shiller (2003) argues that, ?While theoretical models of efficient markets have their place as illustrations or characterizations of an ideal world, we cannot maintain them in their pure form as accurate descriptors of actual markets? (p. 102). He also claims that the belief in efficient market theory was eroded by a succession of anomalies that were discovered, many in the 1980s, and provided evidence for the volatility of excess returns. To him, it is important to distance oneself from the assumption ?that financial markets always work well and that

price changes always reflect genuine information? (p. 102). In the same sense, Stout (2003) considers that ?the idea of market efficiency has fallen into disrepute as a result of market events and the growing empirical evidence of inefficiencies? (p. 635).

Thaler (1999) states that, adding a human element, it is possible to enrich the understanding of financial markets. According to Shiller (2003), through ?... collaboration between finance and other social sciences? (p. 101) knowledge of these vast markets is now deeper. The results of the works derived from that collaboration are integrated into Behavioural Finance. De Bondt et al., (2008) argue that Behavioural Finance emerged as a field of science in the early 1980s to replace the dominant paradigm of Modern Finance.

Behavioural Finance has been defined by different authors. For example:

- A moderate, agnostic approach to the study of financial markets (Thaler, 1999).
- Finance as a broader social perspective including psychology and sociology (Shiller, 2003).
- A field that seeks to combine the behaviour and cognitive psychological theory with conventional economics and finance in order to provide explanations for the fact that people make irrational financial decisions (Seth & Chowdary, 2017).

Thaler (1999) considers that ?the premise of Behavioural Finance? that cognitive biases may influence asset prices?is at least theoretically possible? (p. 13). Joo and Durri (2015)stress that Behavioural Finance takes into account the effect of psychological traits on how investors make investment decisions, thus trying to fill the gap between actual and expected behaviour. Bakar (2016) highlights the existence of factors such as conservatism and herding considered in Behavioural Finance theory.

Seth and Chowdary (2017) assume, unlike Traditional Finance, that there are limits to arbitrage and humans are not always rational. To them, Behavioural Finance seeks to explain the actions of a ?real man?, while Modern Finance, those of an imaginary ?economic man?.

De Bondt et al., (2008) consider that ?Behavioural Finance is based on three main building blocks? (p. 11):

> Sentiment: investor error. Errors originate at the level of the individual but can manifest themselves at the level of the market.
>
> Behavioural preferences: ?capture attitudes about risk and return which do not conform with the principles of expected utility theory ? rational information traders exploit behavioural inconsistencies of irrational of noise traders, and in so doing lead prices to be efficient? (p. 11).
>
> Limits to arbitrage: there are limits to arbitrage and, consequently, the prices need not be efficient.

Behavioural Finance examines what happens to prices when market participants do not share rational expectations (Stout, 2003; Lavoie & Daigle, 2011). It studies the nature and quality of financial judgments and choices made by individual economic agents and delves into the

consequences for financial markets and institutions (Hertwig et al., 2005). It also analyses the way psychology impacts financial decisions in households, markets, and organisations. It investigates what people do and how they do it, mainly adopting inductive methods. It ponders on the implications of behavioural phenomena for asset valuation. Its proponents argue that ill-informed and unsophisticated investors lead to inefficiency in financial markets (De Bondt et al., 2008; Duclos, 2015).

Kleinübing Godoi et al., (2005) defined the main topics of Behavioural Finance studies: loss aversion, excessive self-confidence, exaggeration as to optimism and pessimism, and overreaction and underreaction to market news. The fact that people cannot find explanation for their financial attitudes seems to reveal certain deviant actions, which can be subdivided into two groups of deviations: cognitive (generated by time constraints, memory, and attention) and emotional. Behavioural Finance has prioritised cognitive studies. The authors mentioned above maintain that the specific contribution of psycho-analytical theory is the concept of unconscious reasons (cognitive and emotional errors) that determine the type of bound between the person and the money. The way people deal with money would only be the reflection of their emotions and their unconscious processes.

Ariely et al., (2005) exploit the constructs of emotional connection and cognitive perspective, which they consider help to define the boundaries of loss aversion. They argue that the emotional connection changes loss aversion because it moderates the degree to which the waiver of an item involves a loss, while changes in the cognitive perspective explain why items typically seen as losses are assigned more or less weight. They also consider the dependence on a reference to be another important aspect of loss aversion. Loss aversion and regret aversion may be the reasons why many investors seek to follow market behaviour, not assuming the errors themselves. Kahneman and Tversky (1979) and Statman (1999) refer to the pain individuals feel when they discover that other choices would have provided better results. According to Rabin (as cited in Kleinübing Godoi et al., (2005) ?... loss aversion configures the decision maker?s tendency to be more sensitive to reductions than to raisings in the level of well-being. It means that individuals tend to prefer the status quo to changes that might bring loss of some goods? (p. 49).

The main features of behavioural preferences are, according to De Bondt et al., (2008):

> Loss aversion: the reluctance of investors to obtain losses;
>
> Regret aversion: stipulates that investors may want to avoid losses for which they can easily imagine having made a superior decision (ex-post);
>
> Mental accounting: refers to how people categorize and evaluate financial results (Henderson & Peterson, 1992);
>
> Myopic loss aversion: combines time horizon framing-based and loss aversion. Investors are more averse to risk when their time horizon is short than when it is long (Haigh & List, 2005);
>
> Self-control: refers to the degree to which people can control their impulses (p. 11-12).

As stated by Kleinübing Godoi et al., (2005), research related to Behavioural Finance was incorporated in the context of finance in recent decades, contradicting the expected utility theory inherent to Modern Finance. While Kahneman and Tversky (1979) were among the pioneers in this area, it was in the 1990s that the Academy began to question the model of Modern Finance (Haugen, 2000) and investigate irrational investor behaviour.

To Shiller (2003), research in the area of Behavioural Finance is not expected to provide a method to earn a lot of money, quickly and reliably, from financial market inefficiency. One should not expect markets to be so inefficient that immediate profits are constantly available; however, market efficiency may be fundamentally wrong in other ways. For example, market efficient theory can lead to dramatically incorrect interpretations of events as great bubbles in the stock market.

De Bondt et al. (2008) argue that Behavioural Finance presents evidence that contradicts the notion of efficient markets. Furthermore, in prospect theory, developed by Kahneman and Tversky (1979), the structure of preferences is based on best known behaviours (other frameworks, according to Shefrin & Statman, 2000, include SP/A theory and the theories of the process of change; of regretting; of the effect; and of self-control).

Prospect Theory

In line with the relevance of prospect theory in the literature and the aim of the present study, it is important to mention the leading authors in this field. Kahneman and Tversky (1979) describe various classes of choice problems in which preferences systematically violate the axioms of expected utility theory. Thus, they criticised said theory as being descriptive for decision-making under risk conditions and developed an alternative model: prospect theory. They argue (Tversky & Kahneman, 1981) that this theory should be seen as an approximate, incomplete, and simplified description of the evaluation of prospects at risk. To them (Tversky & Kahneman, 1992), prospect theory is derived from ? the tradition that assumes the rationality of economic agents? (p. 317); therefore, it is descriptive and not prescriptive.

In prospect theory, Kahneman and Tversky (1979) attach value to gains and losses at the expense of final results. They argue that choices among risky prospects show multiple diffuse effects that are inconsistent with the basic assumptions of expected utility theory. In particular, people assign less weight to results that are merely likely compared with results obtained in conditions of certainty (certainty effect). This trend contributes to risk aversion in choices involving secure gains and demand for risk in choices that involve certain losses.

De Bondt et al., (2008) argue that prospect theory describes how people systematically violate the axioms of expected utility theory. They hold that prospect theory differs from the expected utility theory in the sense that probabilities are replaced by decision weights and the value

function is defined in relation to gains and losses, and not in relation to final wealth.

According to Booij et al., (2010), prospect theory can explain choice behaviour, better than expected utility theory, ?... because it makes the plausible assumption that risk attitudes are not only driven by sensitivity towards outcomes (utility curvature), but also by sensitivity towards probabilities (probability weighting), sensitivity towards whether outcomes are above or below a reference point (loss aversion)? (p. 1).

Barberis (2013) considers that Kahneman and Tversky (1979) were able to demonstrate, in laboratory conditions, that people systematically violate the assumptions of expected utility theory. In addition, with their prospect theory, they ?elegantly captured the experimental evidence on risk taking, including the documented violations of expected utility? (p. 173). Said author emphasizes the following elements of prospect theory:

> Reference dependence: the most basic idea in prospect theory.
> Loss aversion: it plays a useful role in many applications.
> Diminishing sensitivity: it seems to be much less important.
> Probability weighting: it has drawn growing interest in recent years, attracting significantly more empirical support.

Tversky and Kahneman (1992) state that, in standard applications of expected utility theory, the objects of choice are probability distributions related to wealth, the evaluation rule is expected utility, and utility is a concave function of wealth. The utility of a prospect is therefore the sum of its results, each one weighted by its probability. Therefore, they propose the revision of the following elements to formulate an alternative descriptive theory in which

- The objects of choice are prospects framed in terms of gains and losses;
- The evaluation rule is a cumulative function divided into two parts; and
- The value function is shaped as a letter S; and the weight function, as a reversed S.

The same authors (Tversky & Kahneman, 1992) claim that the empirical evidence suggests two main changes in expected utility theory: ? 1) the carriers of value are gains and losses, not final assets; and 2) the value of each outcome is multiplied by a decision weight, not by an additive probability? (p. 299).

Rabin and Thaler (2001) argue that ?Conventional expected utility theory is simply not a plausible explanation for many instances of risk aversion that economists study? (p. 221). However, given that prospect theory is, perhaps, more complex than the expected utility theory, there is greater difficulty in its acceptance and widespread application (Seth & Chowdary, 2017). The fundamental difficulty in the application of said theory in economics is, according to Barberis (2013), related to the lack of clarity about what gains or losses represent in any given situation, although it has been accepted that gains and losses are utility generators.

To Kahneman and Tversky (1979) and Tversky and Kahneman (1992), prospect theory distinguishes two stages in the decision-making process: editing and evaluation. The first one consists of a preliminary analysis of the offered prospects, which often leads to a simplified representation of acts, contingencies, and relevant results of the decision. This phase is reflected in the implementation of operations such as encoding, combination, and cancellation, which transform the results and the probabilities associated with the offered prospects. The function of this phase consists in the organization and reformulation of the options in order to simplify the subsequent evaluation and the choice. In the second phase, the decision makers assess the edited prospects, selecting the one with the highest value. At this stage, a V value is assigned to every edited prospect, being

> ... expressed in terms of two scales, ? and ?. The firs scale, ?, associates with each probability p a decision weight ?(p) which reflects the impact of p on the overall value of the prospect. However, ? is not a probability measure and, ? ? (p) + ? (1-p) is typically less than unity. The second scale v, assigns to each outcome x a number ? (x) which reflects the subjective value of that outcome. ... defined in relation to a reference point which serves as the zero-point value of scale. Hence, v measures the value of deviations from that reference point, i.e., gains and losses (Kahneman & Tversky, 1979, p. 14).

The value function is defined from that reference point, being concave for gains and convex for losses, but more inclined for losses than gains. This function, according to Bromiley (2010), exhibits several critical features: ?has greater risk seeking or risk aversion near the reference point than farther away from the reference point?, ?predicts extreme risk aversion for most mixed gambles? (p. 5-11), and creates ?the need to specify the metric of the outcome? (p. 12).

In the evaluation phase, according to Seth and Chowdary (2017), the prospects? probabilities are replaced by decision weights, which, as a rule, are not necessarily the same as their corresponding probabilities. To Kahneman and Tversky (1979), decision weights are generally lower than their corresponding probabilities, except in the area of low probabilities.

Seth and Chowdary (2017) consider that ?the value function represents the utility that is achieved as a result of a certain amount of gain or loss? (p. 1139) and it is S-shaped. ?Similar to utility theory, at higher probability of gain it is concave in nature. However, it is convex when the probability of gains is very small?. The S shape of the function value is derived from the

> testable hypothesis that people are risk averse when the probability of gain is large and positive, but risk seeking when the probability of gain is small and positive. The reverse is the case for losses. When the probability of losses is large the value function is convex and when the probability of loss is very small it becomes concave. This implies that investors are risk seeking when the losses are large and risk averse when the losses are small. Also the value function of losses is much steeper than the value function of gains. This shows that a loss creates a greater feeling of having low value (pain) compared to the feeling of having higher value (joy) created by an equivalent gain (Seth & Chowdary, 2017, p. 1139).

However, as suggested by Barberis (2013), the proposed model based on prospect theory still presents some limitations: ?... it can be applied to gambles with at most two nonzero outcomes, and it predicts that people will sometimes choose dominated gambles? (p. 174). Then, Tversky and Kahneman (1992) published a modified version of the theory that solves the problems related to said limitations. Nevertheless, another limitation was the fact that the order of the actions in the editing phase could ?... have effects on what form of prospect survives until the evaluation phase?. As a result, Tversky and Kahneman later abandoned the editing phase, although they acknowledged its importance ?... in the decision making process and it can account for some oddities in the observed choices? (Lewandowski, 2017, p. 293). In fact, Tversky and Kahneman (1992) developed what they called the cumulative prospect theory around the following main phenomena:

- Framing effect: They confirmed that, contrary to the provisions of a rational decision, framing variations of options could lead to different decisions;
- Non-linear preferences: These preferences were observed in decisions involving things that are certain;
- rce dependence: They found that the bet on an uncertain event depended, not only on the degree of uncertainty, but also on its source;
- Propensity to risk: They observed the existence of propensity to risk in two classes of problems: first, people often prefer a low probability of winning a large prize over the expected value of that prospect; second, the propensity to risk prevails when people have to choose between a certain loss and a substantial probability of a greater loss;
- Loss aversion: It exists. The extent of the pain experienced in case of a loss is greater than the satisfaction when gains are obtained.

Thus, this theory is applicable to uncertain prospects and risk prospects regardless of the number of outcomes and allows different weight functions for gains and losses. Tversky and Kahneman (1992) described a new experience that confirmed risk aversion for gains and risk propensity for high-probability losses, as well as the propensity to risk for gains and risk aversion for low-probability losses.

To stress the increasing importance of prospect theory, Greenberg and Lowrie (2012) emphasize the existence of about 200 articles, published in the journal Risk Analysis in the last 30 years, in which this theory was used to better understand human and environmental risks, among other aspects. According to Barberis (2013), after more than 30 years of its original version (Kahneman & Tversky, 1979), prospect theory is still considered the best description of the way people assess risks in experimental contexts.

Finance and insurance are two fields of economy where prospect theory has been further applied. Such theory became a model for decision making under conditions of risk; therefore, it may be more appropriate

for situations in which risk attitudes play a crucial role. Lately, prospect theory has expanded its scope into several other areas, including consumer choice, industrial organization, and contract theory (Barberis, 2013). Recently, prospect theory has also been used to explain a series of empirical and experimental discoveries regarding settlement decisions of economic agents. However, the literature does not include a formal model to analyse settlement decisions in line with said theory (Kyle et al., 2006).

Based on the literature review above, one can deduce, as Joo and Durri (2015), that prospect theory has been applied to the identification of portfolio anomalies (which can be explained considering the psychological traits of individuals or groups) and the development of highly profitable portfolios by exploring behavioural biases. Therefore, the notions of rational behaviour and profit maximization are not complete if they do not consider the traits/behavioural biases of individual investors, analysts, or portfolio managers. The controversy between Behavioural Finance and Modern Finance appears to derive mainly from the issue of market (in)efficiency. According to Seth and Chowdary (2017), while the proponents of the efficient market hypothesis believe that markets are efficient, those of Behavioural Finance believe that markets are intermittently inefficient. These and other anomalies found in empirical evidence (for example, the fact that investors are not always rational) or loss aversion are studied by Behavioural Finance, in particular, prospect theory.

Empirical studies

The following are some examples in a wide range of studies published in the field of Behavioural Finance, more specifically, prospect theory:

Kahneman and Tversky (1979), as a result of their criticism of expected utility theory, as explained above, developed prospect theory. They used the questionnaire technique applied to students and teachers (ranging from 66 to 95 participants, depending on the prospects) of a university faculty adopting the method of hypothetical choices. They studied the occurrence of certainty, isolation, and reflection effects and found that, in situations of uncertainty, people are prone to risk regarding losses and risk averse regarding earnings.

Tversky and Kahneman (1981) described decision problems in which people systematically violate consistency and coherence requirements that are satisfied in decisions based on human rationality. They related these violations to psychological principles that govern the perception of decision problems and the evaluation of options. They used the questionnaire technique applied in a classroom context to a sample of students from British Columbia University. They observed that decisions involving gains were often risk averse, and decisions involving losses were often prone to risk. Moreover, they found the occurrence of systematic preference reversals via variations in the framing of acts, contingencies, or results.

Kleinübing Godoi et al., (2005)investigated the possible influence of present meanings on investors? experiences for the formation and manipulation of feelings of loss. They conducted qualitative research, used the technique of qualitative in-depth interviews, and classified outcomes into analytical categories they had created, which comprise the set of feelings associated with the phenomenon of loss aversion. Thus, they found that much of the meaning of money reflected in investors? speech came from their childhood and the chance of loss was assumed to be natural. Additionally, guilt and self-loathing systems were present along with the tendency for self-punishment and the use of streamlining mechanisms. Aversion stemmed from fear and distress due to pain caused by effective losses, and, as a result, strange ways to systematically deal with risk and loss were created.

Novemsky and Kahneman (2005) examined loss aversion, simultaneously, in conditions with and without risk in order to understand the boundaries of this phenomenon. They used different populations and the questionnaire technique, focusing on individual intentions and how such intentions could produce or inhibit loss aversion. Their results suggested that similar transactions were assessed differently depending on size.

Kimura et al., (2006, p. 42-57), based on the study conducted by Kahneman and Tversky (1979), sought to identify the (in)consistency of effective decision making in the theoretical model of expected utility maximization. They used the questionnaire technique applied to a sample of more than 90 students and teachers, compared prospects, and analysed certainty, reflection, and structuring effects and attitude towards risk. They applied the Chi-square test and claimed that the results suggested that a considerable portion of the population might violate the expected utility rule in financial decision making. They also argued that the risk assessed by individuals seems to depend on the certainty effect, the reflection effect, and how alternatives are structured (as opposed to the standard deviation of returns), in line with the modern theory of finance.

Kyle et al., (2006)sought to solve the liquidation problem for an agent with preferences consistent with prospect theory. They created a formal structure to analyse liquidation decisions made by an economic agent in the context of prospect theory. They established that this agent wished to keep a project with a Sharpe ratio relatively lower if the project was currently generating losses, and he intended to liquidate it when it reached the break-even point. Otherwise, the agent could liquidate the project with a relatively higher Sharpe ratio if current gains increased or reached the equilibrium point.

Abdellaoui et al., (2013) sought to find empirical support for prospect theory in ?naturally occurring circumstances? (p. 411). They used a sample composed of private bankers and fund managers and adopted a utility measurement method ?based on the elicitation of utility midpoints? created by Abdellaoui et al., (2007, p. 1670), their study confirmed prospect theory as the financial professionals

> ?were risk averse for gains and risk seeking for losses and their utility was concave for gains and (slightly) convex for losses. They were also averse to losses, but less so than commonly observed in laboratory studies and assumed in behavioral finance? (p. 411).

Haubert et al., (2014) tried ?to understand the behaviour of the Portuguese post-graduate students to its operations in investments based on behavioural finance? (p. 183). They conducted a quantitative study and applied a questionnaire to 130 students from Lisbon. They observed ? the predominance of conservative and moderate profiles? and confirmed the occurrence of ?risk aversion in the field of gains and risk propensity in the field of losses? among students in the sample.

Angelovska (2015) sought to determine if the behaviour of individual investors in the stock market could be explained by factors related to the behavioural approach of financial market studies. She used convenience sampling and descriptive statistics. The results showed that the investors in the sample were not behaving in a completely rational way or as suggested by prospect theory and regret aversion.

Seth and Chowdary (2017), in order to overcome the criticism that experimental research always uses university students as subjects, tested Kahneman and Tversky?s prospect theory (1979) on officers from Indian Statistical services (significantly older than the participants in Kahneman and Tversky?s study) to see if they showed the same kind of bias. Their results were qualitatively similar to those found by Kahneman and Tversky (1979), but not as strong. Therefore, they concluded that experience helps to reduce bias.

Therefore, researchers in the field of Behavioural Finance, in particular with regard to prospect theory, often seek to identify the reasons behind certain investment decisions in uncertain conditions, and they try to verify the assumptions of the theory. Kleinübing Godoi et al., (2005) maintain that research in the field of Behavioural Finance seeks to find anomalies that question the efficient market, while De Bondt et al., (2008) argue that such research has proven to be productive, offer a pragmatic approach to financial decision making studies, and introduce a new type of discipline in social science research. Furthermore, with its focus on people and their relationship with money, Behavioural Finance is a stimulating field for the Academy community. However, the latest authors stress that such studies lack a unified theoretical framework for different theories; furthermore, they can be described by analogy and do not go beyond the micro level of ?mistakes?, thus leaving too much unintelligible behaviour. They considered Behavioural Finance to be a work in progress, unfinished, whose main purpose is to behaviourise finance, not to create a separate field of scientific study.

Questionnaires are generally administered for data collection, but other instruments can also be used for different sample compositions; in addition, both laboratory and natural circumstances should be described.

3. METHOD

In order to prove the assumptions in prospect theory, the present study adopted bibliographic and descriptive methods. We used primary sources, such as books and scientific papers, and primary data obtained from a questionnaire applied to students attending the first year of a master?s program in finance at a Portuguese Polytechnic Education Institution. The questionnaire, adopted from Kahneman and Tversky (1979), was applied in a class context (as in Tversky & Kahneman, 1981) four consecutive years between 2012 and 2015. As Kimura et al., (2006), and for the same reasons they cite, we replaced the original currency with euros. The instrument consists of a set of alternative response questions aimed at unveiling respondents? preferences regarding the situations they are presented with.

The non-probabilistic sample included all the students in the class on the day that the topic of Behavioural Finance was taught in the context of a module on finance theory and research. Table 1 details the sample composition by sex and age group. Considering the characteristics of the study, we used (minimum and maximum) relative localization measures as statistics and a frequency table that summarises the information about the sample, where the values are distributed into intervals.

Table 1.
Sample composition

		Total	Up to 25 years old	26 to 30 years old	More than 30 years old	No answer
2012						
Male		4	1	1	2	-
Female		11	1	5	5	-
No answer		1	-	-	1	-
Total		16	2	6	8	
2013						
Male		12	4	5	3	-
Female		14	9	4	1	-
No answer		-	-	-	-	-
Total		26	13	9	4	
2014						
Male		3	0	1	1	1
Female		12	5	2	5	0
No answer		1	0	0	0	1
Total		16	5	3	6	2
2015						
Male		2	1	0	1	-
Female		8	3	3	2	-
No answer		-	-	-	-	-
Total		10	4	3	2	-
Total	Male	21	6	7	7	1
	Female	45	18	14	13	0
	No answer	2	0	0	1	1
	Total	68	24	21	21	2

Tabla 1. Composición de la muestra
Source: Created by authors.

In 2012 and 2014, the sample included exactly the same number of students; they were mostly females and over 30. In 2013, the sample involved a higher number of students, almost as many females as males and, above all, aged up to 25. Finally, in 2015, the sample gathered the lowest number of students, mostly female and, above all, under 25. There were 68 respondents in total; more than 66 % of them were females, more than 35 % were under 25, and the remaining participants were equally distributed into the other age groups under consideration.

As Kahneman and Tversky (1979), Kimura et al., (2006), and Seth and Chowdary (2017), among others, we analysed the certainty effect (Questions 1?6), the reflection effect (Questions 3, 4, 7, and 8), the isolation effect (Question 9), and the attitude toward risk (Questions 7 and 8) of respondents. Finally, in Questions 10 and 11, the questionnaire tries to establish if respondents assign a greater weight to changes in wealth or to states of wealth.

4. RESULTS

This section presents each question in the instrument followed by a table that details the results obtained in this study and those in previous studies, namely, Kahneman and Tversky (1979), Kimura et al., (2006), and Seth and Chowdary (2017). Such results will be discussed in Section 5.

Question 1 presents the choice between alternatives A and B:

A: 33 % chance to win €2500; and 66 % chance to win €2400	B: 100 % chance to win €2400

Question 2 offers a choice between alternatives C and D as follows:

C: 33 % chance to win €2500	D: 34 % chance to win €2400

Table 2 shows participants? answers to both questions.

Table 2.
Answers to Questions 1 and 2

	Question 1			Question 2		
	A	B	No answer	C	D	No answer
2012	31 %	69 %	-	31 %	69 %	-
2013	27 %	69 %	4 %	54 %	42 %	4 %
2014	44 %	56 %	-	25 %	69 %	6 %
2015	30 %	70 %	-	30 %	70 %	-
Total	32 %	66 %	2 %	43 %	54 %	3 %
Kahneman and Tversky (1979)	18 %	82 %	-	83 %	17 %	-
Kimura et al., (2006)	30 %	70 %	-	52 %	48 %	-
Seth and Chowdary (2017)	17 %	83 %	-	50 %	50 %	-

Tabla 2. Respuestas a las Preguntas 1 y 2
Source: Created by authors.

The outcomes of Question 1 show that the majority of respondents chose B (a 100 % chance to win perspective) considered either annually or in total. However, that preference was less prominent among the students who attended the course in 2014. Regarding Question 2, except for 2013, respondents clearly indicated a preference for alternative D (a little higher chance to win a slightly lower amount), which was selected by most participants in total.

Question 3 offers a choice between alternatives A and B, as follows:

A: 80 % chance to win €4000 B: 100 % chance to win €3000

Question presents the choice between alternatives C and D:

C: 20 % chance to win €4000 D: 25 % chance to win €3000

Table 3 presents the responses to Questions 3 and 4.

Table 3.
Answers to Questions 3 and 4

	Question 3		Question 4	
	A	B	C	D
2012	-	100 %	25 %	75 %
2013	35 %	65 %	27 %	73 %
2014	19 %	81 %	31 %	69 %
2015	30 %	70 %	40 %	60 %
Total sample	22 %	78 %	29 %	71 %
Kahneman and Tversky (1979)	20 %	80 %	65 %	35 %
Kimura et al., (2006)	29 %	71 %	57 %	43 %
Seth and Chowdary (2017)	18 %	82 %	48 %	52 %

Tabla 3. Respuestas a las Preguntas 3 y 4
Source: Created by authors.

The preference for alternative B (a 100 % chance to win perspective) is notorious in Question 3, considered both annually and in total; in turn, the answers to the fourth question are mostly D (a little higher chance to win a slightly lower amount), also considered both annually and in total.

Question 5 offers a choice between two alternatives, A and B, as follows:

A: 50 % chance to win a three-week trip to England, France and Italy. B: 100 % chance to win a one-week trip to England.

Question 6 presents a choice between alternatives C and D, as follows:

C: 5 % chance to win a three-week trip to England, France and Italy.	D: 10 % chance to win a one-week trip to England.

Table 4presents the responses to Questions 5 and 6.

Table 4.
Answers to Questions 5 and 6

	Question 5			Question 6	
	A	B	No answer	C	D
2012	25 %	75 %	-	38 %	62 %
2013	12 %	85 %	3 %	31 %	69 %
2014	31 %	63 %	6 %	38 %	62 %
2015	30 %	70 %	-	40 %	60 %
Total sample	22 %	75 %	3 %	35 %	65 %
Kahneman and Tversky (1979)	22 %	78 %	-	67 %	33 %
Kimura et al., (2006)	20 %	80 %	-	49 %	51 %

Tabla 4. Respuestas a las Preguntas 5 y 6
Source: Created by authors.

Most answers to the fifth question were alternative B (a 100 % chance to win perspective), annually and in the entire sample. However, regarding Question 6, there is a preference for alternative D (a double % chance to win the lowest prize).

Question 7 offers a choice between alternatives A and B, as follows:

A: 45 % chance to win €6000	B: 90 % chance to win €3000

Question 8 presents a choice between alternatives A and B as follows:

C: 0.1 % chance to win €6000	D: 0.2 % chance to win €3000

Table 5 shows the responses to Questions 7 and 8.

Table 5.
Answers to Questions 7 and 8

	Question 7			Question 8	
	A	B	No answer	C	D
2012	13 %	87 %	-	56 %	44 %
2013	19 %	81 %	-	62 %	38 %
2014	7 %	87 %	6 %	37 %	63 %
2015	-	100 %	-	50 %	50 %
Total sample	12 %	87 %	1 %	53 %	47 %
Kahneman and Tversky (1979)	14 %	86 %	-	73 %	27 %
Kimura et al., (2006)	23 %	77 %	-	72 %	28 %
Seth and Chowdary (2017)	21 %	79 %	-	52 %	48 %

Source: Created by authors.
Tabla 5. Respuestas a las Preguntas 7 y 8

In question 7, alternative B (a double % chance to win half the prize) was consistently selected by the majority. However, in Question 8, respondents expressed dissimilar views. In some years, they preferred alternative C (2012, 2013); in 2014, it was alternative D; and, in 2015, they were equally divided. This situation may occur because the chances to win in both alternatives are very low. Nevertheless, considering the total number of respondents, option C (perspective to win the best prize) was selected by most.

The following questions, as the previous ones, offer a choice between two alternatives, but they introduce chances of loss in order to show the reflection effect (risk aversion in the case of gain and propensity to risk in the case of loss).

Question 3 presents a choice between two alternatives, A and B:

A: 80 % chance of losing €4000 100 % chance of losing €3000

Question 4 also offers a choice between A and B:

A: 20 % chance of losing €4000 B: 25 % chance of losing €3000

Table 6 presents the responses Questions 3 and 4.

Table 6.
Answers to questions 3 and 4

	Question 3			Question 4		
	A	B	No answer	A	B	No answer
2012	69 %	31 %	-	63 %	37 %	-
2013	81 %	15 %	4 %	65 %	35 %	-
2014	63 %	31 %	6 %	44 %	50 %	6 %
2015	80 %	20 %	-	50 %	50 %	-
Total sample	74 %	24 %	2 %	57 %	41 %	2 %
Kahneman and Tversky (1979)	92 %	8 %	-	42 %	58 %	-
Kimura, et al., (2006)	82 %	18 %	-	37 %	63 %	-
Seth and Chowdary (2017)	80 %	20 %	-	47 %	53 %	-

Tabla 6. Respuestas a las Preguntas 3 y 4
Source: Created by authors.

With a very high preference, alternative A, an 80 % chance of losing ? 4000 (vs a 100 % chance of losing ?3000), was the most popular answer to Question 3. In turn, a disparity of choices may be observed regarding Question 4. During the first two years, alternative A was clearly preferred, but in the last two that trend became blurry. However, in total terms, the majority selected alternative A, a 20 % chance of losing ?4000 (vs a 25 % chance of losing ?3000).

Question 7 offers a choice between alternatives A and B:

A: 45 % chance of losing €6000 B: 90 % chance of losing €3000

And Question 8 presents a choice between alternatives A and B:

A: 0.1 % chance of losing €6000 B: 0.2 % chance of losing €3000

Table 7presents the responses to Questions 7 and 8.

Table 7.
Answers to questions 7 and 8

	Question 7		Question 8	
	A	B	A	B
2012	62 %	38 %	56 %	44 %
2013	73 %	27 %	42 %	58 %
2014	56 %	44 %	44 %	56 %
2015	70 %	30 %	20 %	80 %
Total sample	66 %	34 %	43 %	57 %
Kahneman and Tversky (1979)	92 %	8 %	30 %	70 %
Kimura et al., (2006)	75 %	25 %	50 %	50 %
Seth and Chowdary (2017)	61 %	39 %	41 %	59 %

Tabla 7. Respuestas a las Preguntas 7 y 8
Source: Created by authors.

The responses to Question 7 indicate that most participants selected alternative A (half % of losing double the amount), both every year and in the total sample. Such preference was more prominent in 2013 and less so in 2014. In turn, the answers to Question 8 show, except in 2012, that the preference for alternative B (double the chance of losing half the amount) was more prominent in 2015 and less so in 2014.

Question 9 offers a choice between alternatives A and B:

Consider a game with two stages. In the first stage, there is a 75 % probability that the game ends without winning anything and a 25 % probability that you pass to the second stage. Reaching the second stage, one can choose between the following alternatives. Note that the choice must be made before starting the game.
A: 80 % chance to win €4000 B: 100 % chance to win €3000

Question 10 offers a choice between alternatives A and B:

Consider that, in addition to the resources you own, you have received €1000 more. Now, you must choose between the following alternatives.
A: 50 % chance to win €1000. B: 100 % chance to win €500.

Finally, Question 11 represents a choice between alternatives C and D, as follows:

Consider that, in addition to the resources you own, you have received €2000 more. Now, you must choose between the following alternatives.
C: 50 % chance of losing €1000 D: 100 % chance of losing €500

Table 8presents the responses to Questions 9, 10, and 11.

Table 8.
Answers to Questions 9, 10, and 11

	Question 9			Question 10			Question 11		
	A	B	No answer	A	B	No answer	C	D	No answer
2012	25 %	75 %	-	38 %	62 %	-	44 %	56 %	-
2013	19 %	77 %	4 %	39 %	57 %	4 %	65 %	31 %	4 %
2014	38 %	62 %	-	19 %	81 %	-	44 %	56 %	-
2015	10 %	90 %	-	20 %	80 %	-	50 %	50 %	-
Total sample	24 %	75 %	1 %	32 %	67 %	1 %	53 %	46 %	1 %
Kahneman and Tversky (1979)	22 %	78 %	-	16 %	84 %	-	69 %	31 %	-
Kimura et al., (2006)	22 %	78 %	-	38 %	70 %	-	65 %	35 %	-
Seth and Chowdary (2017)	30 %	70 %	-	-	-	-	44 %	56 %	-

Tabla 8. Respuestas a las Preguntas 9, 10 y 11
Source: Created by authors.

The answers to Questions 9 and 10 were clearly focused on alternative B (a 100 % chance to win perspective). Finally, the answers to Question 11 express different opinions. In 2013, respondents preferred alternative C; in 2012 and 2014, most selected alternative D; and, in 2015, they were divided equally. However, considering the total sample, option C (a 100 % chance of losing half the amount perspective) was preferred.

5. DISCUSSION

As suggested by prospect theory and shown in Table 2, the answers to Question 1 confirm the certainty effect. This happened because respondents preferred certain results over probabilistic ones. These results are consistent with studies by Kahneman and Tversky (1979), Kimura et al., (2006), and Seth and Chowdary (2017). Nevertheless, the answers to Question 2 (Table 2), unlike those in Kahneman and Tversky (1979) and Kimura et al., (2006), do not show participants breaking any rule of expected utility rule and are consistent with the decisions in Question 1. Contrary to the authors previously mentioned, the Allais paradox was not confirmed in this study. Seth and Chowdary (2017)observed an equal distribution in the answers, which did not contribute to the purpose of their work.

The answers to Question 3 (Table 3), once again (as Kahneman & Tversky, 1979; Kimura et al., 2006; and Seth & Chowdary, 2017) confirm the certainty effect. The answers to Question 4 (Table 3) showed that the decisions made by respondents followed the rule of expected utility; in that sense, these results differ from Kahneman and Tversky (1979) and Kimura et al., (2006) but are consistent with Seth and Chowdary?s (2017). As the answers to Question 3 focused particularly on alternative B, alternative C was expected (according to prospect theory) to be preferred in Question 4, being the less probability to win more weighted.

The answers to Question 5 (Table 4) clearly show the presence of the certainty effect as the preference was for the 100% certain scenario, which is consistent with Kahneman and Tversky (1979) and Kimura et al., (2006). However, instead of reduced percentages of earnings, we expected participants to search for more meaningful results because, as Kahneman and Tversky (1979) found, when the probability of winning is very low people choose the option with the greatest possible return. Nevertheless, the answers to Question 6 (Table 4), as in Kimura et al., (2006), do not confirm those expectations.

As expected (Kahneman & Tversky, 1979; Kimura et al., 2006; Seth & Chowdary, 2017), regardless of the amount, respondents (Question 7, Table 5) preferred the highest level of certainty over a very high probability of winning more. However, when faced with very low probabilities of winning, respondents, as those in the studies by Kahneman and Tversky (1979), Kimura et al., (2006), and Seth and Chowdary (2017), preferred the option with the highest amount (Question 8, Table 5), but in a much less expressive way than in

said studies. Therefore, when the probability of winning is remote, people are more prone to risk, which leads to a preference for higher gain perspectives. That is, when the probabilities of winning are very high (Question 7), individuals prefer a greater certainty of gaining (conservatism); when such probabilities are greatly reduced, they seek higher earnings (Question 8).

The responses to Question 3 (Table 6), are in line with those obtained by the above mentioned authors, focused mostly on the smaller probability of loss. In turn, in the answers to Question 3, respondents chose the certain gain. An analysis of the responses to those two Questions, 3 and 3, confirms the reflection effect. However, such effect was not proven by the answers to Question 4 (Table 6), unlike Kahneman and Tversky (1979), Kimura et al., (2006), and Seth and Chowdary (2017). We expected that, according to the theory, faced with similar probabilities of losing, participants would decide to accept the lesser amount scenario. Nevertheless, in the present study, respondents (both annually and in total terms) chose the perspective with the lower likelihood, regardless of the loss amount (Question 7, Table 7). Thus, once again, the reflection effect was demonstrated, which is consistent with Kahneman and Tversky (1979) and Seth and Chowdary (2017), and in contradiction with Kimura et al., (2006).

When faced with very low probabilities of losing, respondents chose the lesser amount (Question 8, Table 7), as proposed in prospect theory and confirmed by Kahneman and Tversky (1979) and Seth and Chowdary (2017), and in contrast with Kimura et al., (2006). This behaviour is different from a similar circumstance but when they had the chance to win (question 8). This also confirms loss aversion. The present study also confirms the isolation effect because respondents neglected the similarities of both options presented in Question 9 before making their decision (Table 8), which is consistent with Kahneman and Tversky (1979), Kimura et al., (2006), and Seth and Chowdary (2017). Respondents also preferred certain gains at the expense of uncertain ones, although for a lower amount (Question 10, Table 8). This reflects the existence of risk aversion in the field of earnings, as reported before in studies by Kahneman and Tversky (1979) and Kimura et al., (2006). In this study, respondents chose the lesser likelihood when faced with the perspective of a certain loss, regardless of the amount (Question 11, Table 8). This result consistent with Kahneman and Tversky (1979) and Kimura et al., (2006), although to a lesser degree. The answers to Questions 10 and 11 support one of the pillars of prospect theory, that is, individuals assign a greater weight to changes in wealth than wealth states (Kimura et al., 2006, p. 55); and, according to Kahneman and Tversky (1979), such responses corroborate the premise of reference dependence.

Therefore, some theory assumptions were empirically confirmed in general and others, in all the cases. In the first group were the certainty and the reflection effects; and, in the second, the isolation effect and crucial aspects of the theory, such as risk aversion in the field of earnings, reference dependence, and the relevance given to changes in wealth (at

the expense of wealth states). Regardless, further research should be conducted in the field of Behavioural Finance and, in particular, prospect theory.

6. CONCLUSIONS

Behavioural Finance reflects an evolution in the field of Finance because it extends the knowledge included in Traditional and Modern Finance through the incorporation of psychological aspects, thus acknowledging their role in investment decisions. Although multiple theories make up this area of knowledge, prospect theory, by Kahneman and Tversky (1979), has been the most prominent. Said authors seek to demonstrate certainty, reflection, and isolation effects in investment decision making. They also question the assumption of risk aversion by investors and the fact that they attach greater value to wealth states per se; on the contrary, they claim and aim to prove that investors assign greater weight to changes in wealth.

This study adopted bibliographic and descriptive methods, using Kahneman and Tversky (1979) questionnaire and a non-probabilistic sample of students attending a master?s course in finance at a Portuguese Polytechnic Institution. The assumptions of prospect theory were tested, in particular, the existence of certainty, reflection, and isolation effects, as established in said theory.

The answers to the questions confirmed the isolation effect, the reflection effect (almost always), and the certainty effect (not always). These results were not always consistent with the outcomes of previous studies (Kahneman & Tversky, 1979; Kimura et al., 2006; Seth & Chowdary, 2017). Regarding attitude to risk, assumptions of risk aversion, relevance given to changes in wealth (at the expense of wealth states), and the isolation effect, the outcomes in this article are in line with those obtained by the authors mentioned above, thus supporting prospect theory.

This study is justified because it presents a theoretical framework based on relevant references and contributes to the deepening of the study of the effects defended by prospect theory. However, it has some limitations that derive, for example, from the size of the sample. As a result, one-year analyses had little meaning and the study had to cover several years. Furthermore, the outcomes are only valid in the context of the selected sample.

Further studies could apply the questionnaire to students enrolled in other undergraduate courses at the same institution in the same or different areas. Subsequently, the results could be compared in order to understand the possible effect of financial knowledge on investment decisions and confirm (or reject) the assumptions of prospect theory.

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