
THE RELEVANCE OF PSYCHOLOGY THEORIES TO FINANCIAL ACCOUNTING

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Abstract

Starting from the interest that we have found in psychology sciences in order to understand better the way managers, analysts and last but not least investors behave in the decision making process our study focuses on the link between financial reporting, disclosure policies and investors judgment under uncertainty. The theoretical background describes the rational judgment of investors found in economic utility theories but also looks upon the main cognitive and social psychology for irrational behavior in the decision making process. Our research mainly focuses on measuring the influence of five psychological factors on the irrational behavior of potential investor. We showed that overconfidence occurs when investors overestimate the precision of their private signals and their knowledge about the value of a financial transaction and always remember the successfully times and easily forget the failures. Also, we have pointed out that limited attention is frequently associated with changing in disclosure policies and self-control is negatively related to irrational behavior of investor.

Keywords: psychology theories, financial reporting, disclosure, investor, judgment, decision making process, psychology variables

JEL Classification: M41, A30, B3, C12

Introduction

Economic theories often predict that individuals will act rationally in accordance with normative models such as expected utility theory. But, sometimes psychology theories lead to different predictions than those from economics and may help explain anomalous market responses to financial accounting information. Psychology and social theories are often providing surprising explanations regarding how managers, investors or analysts respond to particular financial accounting issues or disclosure policies.

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Several studies on the topic have based their hypotheses development and theoretical or empirical research on Kahneman and Tversky's (1979) work concerning prospect theory an analysis of decision under risk and on the contribution of Thaler (1999) regarding the development of behavioral finance. Our goal is to demonstrate how psychology theories can be useful to financial accounting researchers to understand and predict investor's decision in terms of changing disclosure policies and increasing the voluntary offer of financial and non-financial information. To accomplish this, we first identify and briefly review theories from both economic and psychology areas that we consider as particularly relevant to financial reporting and disclosure policies. Then we turn our attention on prospect theory looking for a thorough analysis of judgment under uncertainty in the case of investor's decision making process.

We have outlined circumstances where psychology based theories can add some new point of view to understand financial reporting and disclosure issues above that provided by economic theories. It is important to mention that in our measure we are not pretending that psychology theories should or could replace economic-based theories. On the other hand, searching for a correlation between financial reporting and disclosure policies and psychology theories, we are concerned to describe the link between signaling theory and prospect theory.

In the last section of our paper we attempt to provide an empirical support for the assumption that there are some significant connections between psychology theories and financial reporting and between psychology variables and disclosure policies. In order to the test our hypotheses assumed to be related to the irrational behavior of potential investor we have developed a survey by questionnaires. The questionnaire consisted in a number of 17 questions concerning aspects of judgment of decision making in certain situations of financial reporting data, moods and emotions of potential investor and other questions related to psychology facts. Reliability analysis was conducted, in order to study the properties of our measurement scale and the items that composed it. We used the Alpha (Cronbach) model, a model of internal consistency, based on the average inter-item correlation. Last but not least we have tried to test how several psychology variables can influence the irrational behavior of a potential investor in the judgment of decision making.

Kahneman and Tversky's prospect theory

In 1980s many empirical researches' findings (Shiller, 1984; Thaler *et al.*, 1985) did not support efficient market hypothesis. Also, certain market anomalies were consistently linked to the presence of irrational trades by investors as Bernatzi and Thaler (1995) pointed out in their study. An innovative psychology theory was promoted in 1979 by Kahneman and Tversky proposing prospect theory as an alternative to expected utility in describing investor behavior. Kahneman and Tversky first of all expand the experiments of the psychology on decision theory to more real world situations.

Experimental work in the decades after Von Neumann and Morgestern expected utility research, unfortunately showed that people systematically violate

expected utility theory when choosing among risky gambles. In response to this situation in the years that came we could identify an explosion of work on so-called non-expected utility theories, all of them trying to do a better job in order to match with the experimental evidence. Some of the better known models include weighted-utility theory, regret theory, disappointment aversion, rank-dependent utility theories, contingency theory and prospect theory. Of all the non-expected utility theories, prospect theory may be considered the most relevant for financial and accounting applications. We will describe below this theory and try to argue its relevance in financial accounting.

As many researchers observed, expected utility theory is unable to explain why people are often simultaneously attracted to both insurance and gambling. Kahneman and Tversky found empirically that people underweigh outcomes that are merely probable in comparison with outcomes that are obtained with certainty; also people generally discard components that are shared by all prospects under consideration. Under prospect theory, value is assigned to gains and losses than to final assets. Also, probabilities are replaced by decision weights. The value function is defined on deviations from a reference point and is normally concave for gains, implying risk aversion, commonly convex for losses (risk seeking) and is generally steeper for losses than for gains (loss aversion) as we can see in figure 1.

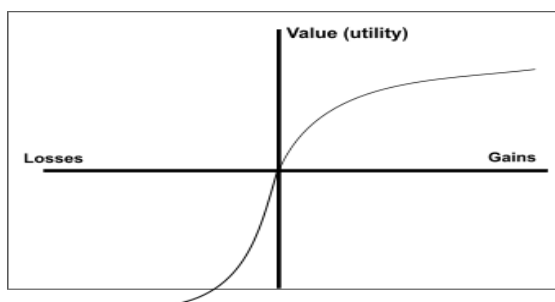


Figure 1

Source: Kahneman and Tversky (1979)

Decision weights are generally lower than the corresponding probabilities, except in the range of low probabilities as figure number 2 reveals.

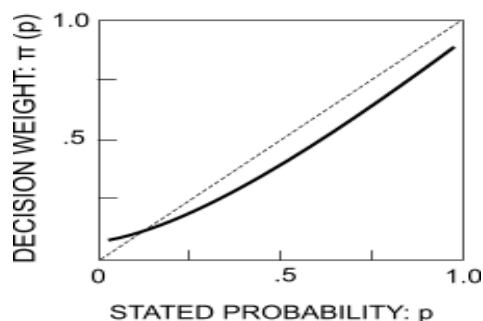


Figure 2

Source: Kahneman and Tversky (1979)

Montier (2002) noticed that prospect theory has probably brought psychology into the heart of economic analysis more than any other approach. Unlike psychology, prospect theory has a solid mathematical basis, making it comfortable for economists to play with. However, in contrast with expected utility theory which deals with the way decisions under uncertainty should be made (a prescriptive approach), prospect theory concerns itself with how decisions are actually made (a descriptive approach). Prospect theory assumes that investors' utility functions depend on changes in their portfolios rather than the value of the portfolio. Put another way, utility comes from returns, not from the value of assets. First, it replaces the notion of "utility" with "value". Whereas utility is usually defined only in terms of net wealth, value is defined in terms of gain and losses as we can observe in the figure above. Because the value function for losses is steeper than that for gains, losses seem larger than gains. For instance, a loss of 1.000 euro is felt more than a gain of 1.000 euro.

Kahneman and Tversky (1979) lay out the original version of prospect theory, designed for gambles with at most two non-zero outcomes. When offered a gamble they proposed:

$$(x, p; y, q),$$

To read as "get outcome x with probability p , outcome y with probability q ", where $x \leq 0 \leq y$ or $y \leq 0 \leq x$, people assign it a value of:

$$\pi(p) v(x) + \pi(q) v(y)$$

where v and π are shown in figure 2. When choosing between different gambles, they pick the one with the highest value.

Bloomfield (2006) argues that prospect theory emphasizes three features of the value function: the hedonic value of an outcome is determined by whether the outcome is a gain or loss relative to the agent's reference points; the negative hedonic value of a loss more than offsets the positive hedonic value of a gain of the same size; and the marginal effect of increasing a gain (or loss) is decreasing in the size of the gain (or loss). It is worth mentioning that an important implication of prospect theory is the "disposition effect" – traders will close out profitable investments quickly, to lock in gains, while holding on to their losing investments or perhaps even invest more in them, hoping that the investment will turn around. So, let's consider for instance that a trader bought a stock at 60 euro, and it is now priced at 90 euro. Using the 60 euro purchase price as a reference point, the trader has a 30 euro gain and because of the marginal effect of increasing a gain is decreasing in the size of the gain, the agent is risk-averse, and will want to close the position quickly to avoid risk. If the price fell to 30 euro, however, the trader has a 30 euro loss and because the marginal effect of increasing a loss is decreasing in the size of the loss, the agent is risk-averse and will want to keep the position open to take on more risk.

Turning back to our major research question: *how could psychology theories influence financial accounting issues*, in the work of Koonce and Mercer (2005) we have found that cognitive and psychology theories lead to different predictions in matters like: earnings management, investor's reaction to disclosure format or how financial analysts' incentives influence their research reports. It is well known that a large body of accounting research examines how and why companies manage their financial results, predictions from these are usually based on economic theories arguments, where earnings management results from managers' rational choices for a given set of constraints. But a well-developed JDM theory about decision making under uncertainty, suggests several explanations for earnings management that would not usually be taken into account by accounting researchers. Namely, prospect theory provides a descriptive theory of decision making under uncertainty. The shape of this value function implies that firms will manage earnings to avoid small earnings losses. This feature implies that the pain associated with a loss is greater than the pleasure associated with an equal-sized gain. As we have seen above, the concavity of the value function in the gain domain implies that investors will experience diminishing marginal utility from additional reported gains and also that investors will prefer to invest in companies that report a series of small gains rather than companies that include some large gains and some small losses. Prospect theory also makes predictions about how firms will manage earnings in especially profitable times. The concavity of the value function for gains implies that investors will prefer to see gains broken out and reported in separate periods rather than reported all at once in a single period. Finally, the same psychology theory predicts that investors will evaluate a company's reported results relative to some reference points, like: including earnings in a prior year, the consensus analysts forecast number and zero (DeGeorge et al., 1999).

Archival research in financial accounting has shown that the format of an accounting disclosure can influence whether and how investors use the information contained in it. Thus, Cotter and Zimmer (2003) show that investors are more likely to positively value information about a company's asset revaluations if the information is recognized in the financial statements rather than disclosed in the footnotes. An explanation of such phenomenon is given by signaling theory. According to this signaling explanation, variations in the placement or description of information may provide signals to decision makers about the meaning of this information. As Hodge et al. (2003) point out in an example, information contained in the footnotes is often less reliable than information recognized in the financial statements. Consequently, managers may attempt to signal that information is unreliable by choosing footnote disclosure rather than financial statement recognition. Put in other words, investors may react differently to disclosures of different formats because there is information content in the format itself. Following the idea of Cotter and Zimmer (2003), they argue that the reason investors put a higher price on upward asset revaluations when they are recognized in the balance sheet rather than disclosed in the footnotes is that they rationally infer that recognized revaluations are more reliably measured than those merely disclosed.

Unlike this rational argument offered by signaling theory, psychology suggests that format effects may arise even when a disclosure's format does not provide relevant information. Thus, in opinion of Koonce and Mercer (2005), psychology offers two additional explanations for format effects:

- format may influence investors' decisions due to differences in the relative ease of processing different formats; and
- certain formats may lead to systematic biases in investors' cognitive processing of the information disclosed.

These psychological explanations allow for new predictions about when and how format influences investor's reactions to the disclosure policies.

In order to understand when and how analysts' incentives influence their research reports, much of the existing literature on analyst expertise assumes that analysts have accuracy as their goal. As Jensen and Meckling (1976) showed, economic theories recognize the important role that incentives play in behavior. For instance, if analysts have incentives to maintain access to management, economic theories predict that awareness of these incentives will drive analysts to engage in management pleasing behaviors. One phenomenon that can create biased analysts' judgments is subconscious biases in analysts' information search. Thus, social psychologists have shown that when people search for new information, they seek one that confirms their pre-existing beliefs. The literature on the topic (Arkes, 1991) suggests that analysts' incentives to please management will lead to biases in their search for new information about the firm. Moreover, these effects will not be eliminated by penalizing analysts' for biased reporting, because analysts probably are not aware of the extent the management's preferences are influencing their information search. Another phenomenon that can create biases in analysts' judgments is biased information processing. Related to this, social psychologists have shown that people are more critical of information that disconfirms a favored hypothesis than information that confirms the hypothesis (Edwards and Smith, 1996).

Up here, we may conclude that psychology and social theories are often providing surprising explanations regarding how managers, investors or analysts respond to particular financial accounting issues or disclosure policies. Specifically, prospect theory suggests that investor's preferences for particular patterns of earnings will encourage firms to: avoid reporting small losses; take the occasional "big bath"; create "cookie jar reserves" during very strong years, and finally, attempt to influence the reference points that investors and analysts use to assess reported earnings. This paper is focusing more on investor's behavior in a certain financial reporting environment and in terms of changes in disclosure policies. Thus, we will turn our attention in the next section on psychology issues and attitudes that could explain investor's reaction to changing in financial reporting and information disclosure. After that, we are going to build our research hypothesis.

Methodology and hypothesis development

Irrational behavior of a potential investor can be explained as an opposite attitude to rational behavior of investor based on traditional finance theory like efficient market hypothesis. This irrationality can be explained by psychological and social theories as we have seen in the previous sections of our paper. We are specifically interested in several psychological factors suggested by different authors, and the way they could influence the irrational behavior of a potential investor. Out of the factors recognized (identified) by the literature we have selected five, related to behavior of potential investor in certain conditions of financial reporting and disclosure policies. These are: overconfidence, loss aversion, limited attention, self-control and pattern recognition.

The question of our research is whether these four factors really affect irrational behavior of investors and the main objective of this study is to examine the influence of these variables on the irrational behavior.

Lichtenstein, Fischhoff and Philips (1982) proposed that people often do the wrong judgments of the event happening probability, and comparing to the real happening times it appears to be overestimate this situation. Odean (1998) pointed out that overconfidence may result from investor's overestimate of the precision of their private signals, and their knowledge about the value of a financial security. Overconfident investors who buy and sell aggressively in response to valid private information signals may exploit liquidity traders more profitably than rational investors. Overconfident individuals are also likely to overinvest in acquiring private information, at the expense of leisure. Overconfidence is sometimes reversed for very easy items. Also it implies overoptimism about the individual's ability to succeed in his endeavors. Such optimism has been found in a number of different settings. Men tend to be more overconfident than women, though the size of the difference depends on whether the task is perceived to be masculine or feminine. And since people fail more often than they expect to, rational learning over time would tend to eliminate overconfidence. People tend to attribute good outcomes to their own abilities, and bad outcomes to external circumstances.

Hence, overconfidence provides a further reason for imperfect adjustment. An overconfident individual may wrongly think that he has already taken into account all the important consideration. Such an individual may not perceive the urgency of working hard to adjust for biases. We therefore assume that an individual who neglects some aspect of the economic environment does not update his beliefs in complete deference to the market price as determined by others who are more attentive. He may inattentively fail to reason sufficiently about why the market price differs from his own valuation.

Taking into account all of these psychological aspects, our study proposes the following research hypothesis:

H1: *Overconfidence influences the irrational behavior of potential investor*

Several psychology studies have showed that loss aversion is the phenomenon according to which people tend to be averse even to very small risks relative to a reference point, suggesting a kink in the utility function. These studies have pointed out that risk aversion, regret aversion, and loss aversion may reflect a calculated avoidance of unpleasant future feelings. However, mood and emotions felt today also affect risk taking. More generally, people who are in good moods are more optimistic in their choices and judgments than those in bad moods. These are associated with more detailed and critical strategies of evaluating information. For instance, people feel happier on sunny days than on rainy days, but priming them when asking whether the weather affects their judgment of how happy they are.

H2: *Loss aversion influences the irrational behavior of potential investor*

A fundamental tenet of cognitive science is that people have limited cognitive resources, implying that their attention to financial information and investment opportunities may be determined by economically irrelevant factors such as the way information is presented or how often it is talked about by others. Experiments have found that even experienced analysts draw conclusions that are colored by seemingly irrelevant aspects regarding the form in which financial information is presented. Limited attention may also explain the tendency of companies to attract attention when their earnings are growing rapidly, but be ignored when they perform poorly for long periods. Several theoretical papers imply that individuals who irrationally underestimate risk or trade too aggressively can, on average, earn higher expected profits and/or higher expected utility than fully rational traders. Also, overconfidence may often be a source of limited attention. Investors who overestimate their understanding of the economic environment may tend to neglect details and engage in shoddy analysis. Fischer and Verrecchia (1999), and Verrecchia (2001) find that in imperfectly competitive securities markets, irrationally aggressive trading by informed traders can intimidate rational informed traders, thereby allowing overconfident or aggressive-heuristic traders to earn higher expected utility and profits. However, Verrecchia (2001) find that when survival depends on the level of achieved expected utility, in an imperfectly competitive securities market, on average, the heuristic traders must earn lower expected utility than rational traders.

H3: *Limited attention influences the irrational behavior of potential investor*

Self-control means to dominate one's emotion. Investor with high self-control will avoid reluctant attitude in order to realize loss and realize gains. But they will also realize loss to avoid larger losses. The conventional representation of decisions over time has an additively separable utility function with exogenous, declining exponential weights. However, evidence from psychology suggests that discount rates change with circumstances. Deferring consumption involves self-control, and is therefore related to moods and feelings. There is evidence that discount rates are sometimes remarkably high, that gains are discounted more heavily than losses, that

small magnitudes are discounted more heavily than large ones, that the framing of a choice as a delay versus an advance has a large effect on decisions. Thus, considering the above mentioned psychological issues our next research supposition is:

H4: *Self-control influences the irrational behavior of potential investor*

The human mind has a gift for finding order in chaos, even when objective analysis shows no order to be found. In such cases, people show remarkable consistency in the order they perceive. People fall prey to the gambler's fallacy when they expect that a coin that has come up "heads" many times in a row is then more likely to come up "tails," because such streaks are typically short-lived. The tendency to see patterns in random sequences is likely to be particularly important in financial markets, where competitive pressures force market prices to follow a random walk. Despite the randomness in stock movements, many investors subscribe to "technical analysis" trading strategies, based on elaborate patterns, even though systematic research has found little evidence that such patterns can predict future stock movements. Following the idea of discovering patterns in random sequences and applying a judgment of decision making we may formulate our last research hypothesis:

H5: *Pattern recognition influences the irrational behavior of potential investor*

Measurement, data collection and analysis

In regard to test our hypotheses concerning the irrational behavior of potential investor we have developed a survey by questionnaires. Each question has a five-point scale answer anchored from strong disapproval to strong approval. The choice of scale answers was determined by the fact that this type of questionnaires can be easily processed. Data was collected from University of Oradea, Faculty of Economics by convenient sampling. The sample consisted of master students in Finance and Accounting, with bachelor degree, starting from the assumption that they could be anytime potential investors that have a medium to high level of knowledge regarding financial reporting and investment behavior issues. We have applied 100 questionnaires, only 96 were usable. Fifty two percent of our subjects were male, forty-eight - female. The questionnaire consisted in a number of 17 questions concerning aspects of judgment of decision making in certain situations of financial reporting data, moods and emotions of potential investor and other questions related to psychology facts.

Reliability analysis was conducted, in order to study the properties of our measurement scale and the items that composed it. We used the Alpha (Cronbach) model, a model of internal consistency, based on the average inter-item correlation. The Cronbach's alpha for each latent variable were: overconfidence – 0.758, loss aversion – 0.712, limited attention – 0.832, self-control – 0.859 and pattern recognition – 0.816. All these values are over the threshold value of 0.7, so no item had to be excluded from the scale. In order to uncover the possible underlying structures of our data, exploratory factor analysis was first conducted. Out of the 17 items, 5 optimum factors were extracted, using Varimax with Kaiser normalization

method. All loadings were over 0.5, so each item in our questionnaire is significant. Additionally, a sufficient percentage of 72.44 of the total variance is explained by these factors.

The 17 items were assigned to the following latent factors: overconfidence, loss aversion, limited attention, self-control and pattern recognition. Confirmatory factor analysis was then used in order to determine if the number of factors and the loadings of measured indicators on them conform to our hypothesis. The research framework is presented in Figure 3.

Interpretation of results

The results of our confirmatory analysis are presented in Table 1 as well as in Table 2. The loadings of each factor confirm our hypothesis – we can notice that each observed variable explain in a significant proportion the latent construct.

Table 1.

Construct	Observed variable	Std. beta coeff.	Construct	Observed variable	Std. beta coeff.	Construct	Observed variable	Std. beta coeff.
Limited attention LA	La1	0.838	Over confidence OC	Oc1	0.779	Self control SC	Sc1	0.741
	La2	0.775		Oc2	0.625		Sc2	0.840
	La3	0.779		Oc3	0.696		Sc3	0.847
	La4	0.699	Loss aversion LAV	Lav1	0.952	Pattern recognition PR	Pr1	0.880
	La5	0.673		Lav2	0.881		Pr2	0.875
	0.568	Lav3	0.956	Pr3	0.865			
GFI=0.915 AGFI = 0.897 TLI= 0.953 CFI = 0.934 RMSEA = 0.051 < 0.08								

Table 2.

Path	Hypothesis	Hypothesis direction	Std. Beta coeff.	T value
LA → IB	H1	+	0.189	2.536
OC → IB	H2	+	0.235	3.532
LAV → IB	H3	+	0.256	2.685
SC → IB	H4	-	-0.205	-3.562
PR → IB	H5	+	0.156	3.056

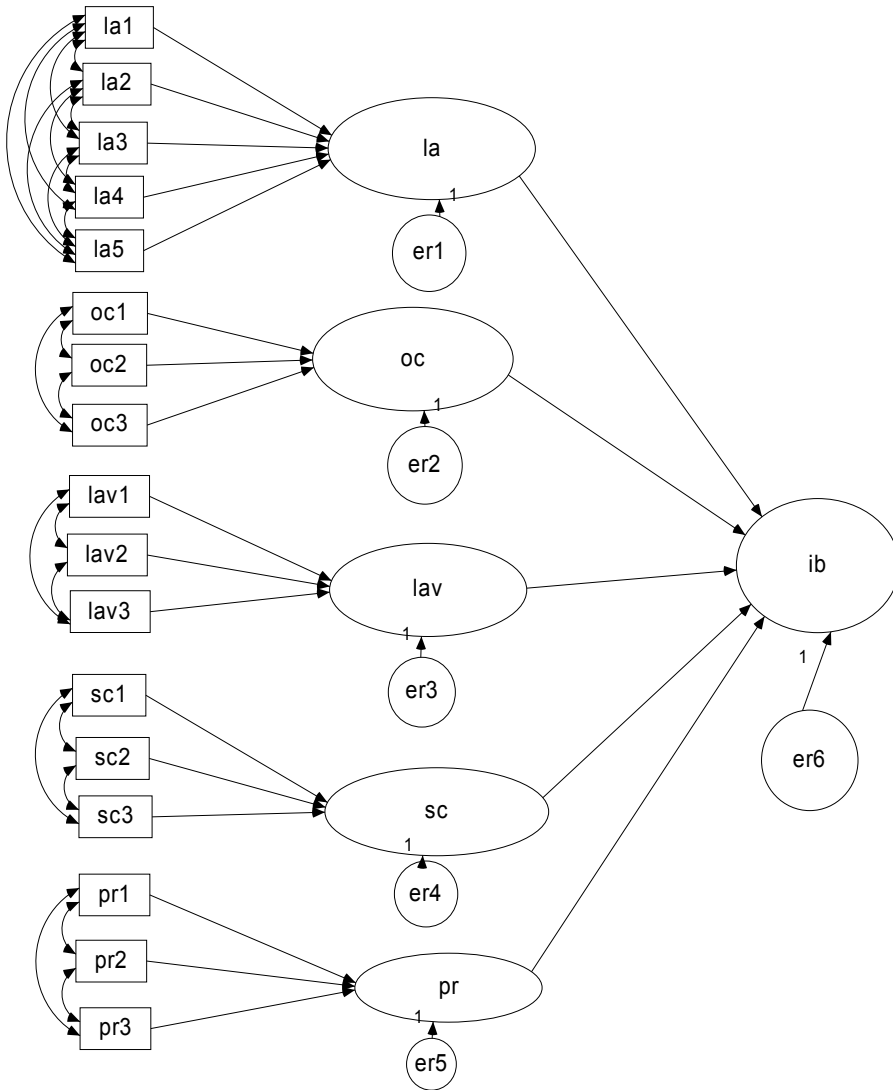


Figure 3

The adequacy of the model is confirmed by the goodness-of fit statistics, which are acceptable. The Tucker Lewis Index (TLI) as well as the Comparative Fit Index (CFI) was used to confirm that, out of several potential factor analysis models, the chosen one has the best properties. The value of the Root Means Square Error of Approximation (RMSEA), smaller than 0.08, confirms the adequacy of the model. The developed structural equation model confirmed each hypothesis. The signs of all the coefficients are consistent with the expected ones. As we can find from the table no. 2 presented above, limited attention, overconfidence, loss aversion and pattern recognition are positively and significantly related to the irrational behavior of

potential investor, while self control is negatively related to it. These results validate all of our research hypotheses.

Concluding remarks and discussion

This study focused on the link between psychology theories and investors behavior in terms of changing in financial reporting and disclosure policies (?). We have found that cognitive and psychology theories lead to different predictions in matters like: earnings management, investor's reaction to disclosure format or how financial analysts' incentives influence their research reports.

Thus, in opinion of Koonce and Mercer (2005), psychology offers two explanations for financial reporting format effects:

- format may influence investors' decisions due to differences in the relative ease of processing different formats;
- certain formats may lead to systematic biases in investors' cognitive processing of the information disclosed.

These psychological explanations allow for new predictions about when and how format influences investor reactions to the disclosure policies.

On the other hand our research focused on measuring the influence of five psychological factors on the irrational behavior of potential investor. We showed that overconfidence occurs when investors overestimate the precision of their private signals and their knowledge about the value of a financial transaction and always remember the successfully times and easily forget the failures. Also, we have pointed out that limited attention is frequently associated with changing in disclosure policies and self-control is negatively related to irrational behavior of investor. Hence, the higher the self-control is the less the irrational behavior exists.

Certainly our research has some limitations. These can be found in the sample size, measurement scale and the link between psychological factors and voluntary disclosure choices. Future research will be oriented towards finding other psychology factors related to irrational behavior of investor, the development of measurement scale, test the psychology variables from managers' perspective and analyze the interactions between psychological variables in order to clarify the correlation among various psychological factors, irrational behavior and financial reporting and disclosure policies.

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