

CLASSICAL AND BEHAVIOURAL FINANCE IN INVESTOR DECISION

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Abstract: Conceptual model of individual investor behavior presented in this paper aims to structure a part of the vast knowledge about investor behavior that is present in the finance field. The investment process could be seen as driven by dual mental processes (cognitive and affective) and the interplay between these systems contributes to bounded rational behavior manifested through various heuristics and biases. The investment decision is seen as a result of an interaction between the investor and the investment environment

JEL classification: G11, G14,G15

Key words: investor behaviour; financial decisions making; cognitive modelling, sentiments; market efficiency

1. INTRODUCTION

Statman [49] argued that “people in standard finance are rational. People in behavioural finance are normal”. Discussing about investor decision and considering that people are rational could be a limitation of the human nature which could lead to important mistakes. This paper tries to create a conceptual model of investor decisions by taking a descriptive point of view of the way investors make their decision, in the real world setting, opposite to rational behaviour proposed by financial theories.

The three main evolutionary current of thinking (efficient market hypothesis, bounded rationality and behavioural finance) are introduced in the section 2. Section 3 is dedicated constructing and analysing the proposed conceptual model and the section 4 is dedicated to the conclusions.

2. BACKGROUND

The efficient market hypothesis (EMH) has been the central proposition of finance for nearly forty years. During the 1970s the standard finance theory of market efficiency became largely accepted by a majority of academics and also by a good numbers of professionals. The basic theoretical case for EMH (Fama[14]) rests on three arguments: the investors are rational and as a result they value securities rationally; assuming that some of the investors are not rational, their trades are random and therefore cancel each other out without affecting prices; accepting a certain degree of irrationality, this kind of investors are met in the market by rational arbitrageurs who eliminate their influence on prices. Based on these, a series a model based on efficiency concept have been developed, started from the initial version who defines the efficient market as a market who rapidly adjust on the latest available information and continuing with the modern version (Fama[15]) where the financial asset prices reflects in a holistic manner all the available information. This

implies that the investors and the market are fully rational and the prices level is determined by the fundamental determinants.

There are three forms of the efficient market hypothesis:

- *the weak form* - all past market prices are fully reflected in securities prices so it is impossible to earn superior risk-adjusted profits based on the knowledge of past prices and return

- *the semistrong form* - all publicly available information is fully reflected in securities prices so the investor cannot gain using this information to predict returns

- *the strong form* - all information is fully reflected in securities prices or in other words, insider information is of no value.

There are mixed empirical results regarding the market efficiency but mostly non supporting the strong form of EMH (Nicholson[41], Basu[5], Rosenberg, Reid and Kanstein[45], Bechev[6], Moustafa[39]). Researchers have documented numerous, persistent anomalies that contradict the EMH as the fundamental anomalies, technical anomalies, calendar and weather anomalies. The *fundamental anomalies* appear for instance because investors consistently overestimate the prospectus of growth companies and underestimate the value of out-of-favor companies. Also numerous studies have shown that low price-to-earnings (P/E) value stocks tend to out-perform both high P/E stocks and the market in general. *The technical anomalies* are revealed due to the use of technical analysis which attempt to forecast securities prices by studying past experiences. Sometimes technical analysis finds inconsistencies with respect of efficient market hypothesis, called technical anomalies. In the last categories one could easily include some very well known anomalies as: January effect, Monday effect, December effect, Turn-of-the Month effect, SAD effect

One alternative solution, acknowledging a lot of anomalies which contest the efficiency, information symmetry and investors rationality is represented by the bounded rationality models, firstly promoted by Herbert Simon. He supports the idea of a partially rational investor who takes just a part of the decisions based on fundamental criteria and the rest based on emotional irrational factors. Starting from his work, a series of other studies March[37], Rubinstein[46], Gigerenzer and Selten [18], Kahneman[28], Hirshleifer, Hou and Teoh[23] are using the bounded rationality to explain the individuals decision determinants, using fundamental methods on information analysis and understanding the information, even the asymmetrical ones. A development of this line is represented by the so called fuzzy logic, the neural networks and genetic algorithms. (Chiang[12], Kim and Chum[30], Aiken and Bsat[1], Romahi and Shen[44]) formulated decisional models based on a postulated rational behaviour in imperfect information conditions. Generally speaking the mentioned studies seems to try to solve two different kinds of problems: the portfolio optimisation (including the efficiency frontier) and the short term prediction of the asset prices dynamics (Lowe[35])

Other solution could be represented by including psychology in finances. As Statman states [49] "some people think that behavioural finances introduced psychology in finances but psychology was never out of finance. Although models of behaviour differ, all behaviour is based on psychology". In the last decades there been a lot of works analysing the investor psychology and the way it affects his decisions and the market. In their seminal work, Tversky and Kahneman [51] investigate heuristics that people often employ when making decisions under uncertainty (representativeness, availability, adjustment and anchoring). Despite the usefulness of heuristics (they could make the probability valuation of the uncertain events much easier) they could also lead to systematic biases. Kahneman

and Riepe[27] focus on biases in beliefs and preferences of which financial advisors should be aware: **judgement biases**: overconfidence, optimism, hindsight, over-reaction to chance events; **errors of preference** :non-linear weighting of probabilities, people value changes not states, value function, the shape and attractiveness of gambles; **the purchase price as a reference point**: narrow framing, repeated gambles and risk policies, short and long views; **living with the consequences of decisions**: regrets of omission and commission, regret and risk taking. In his book Shefrin [47] presents a large number of heuristic driven biases (representativeness bias, gambler's fallacy, overconfidence, anchoring and adjustment, conservatism, ambiguity aversion, emotion and cognition) and frame-dependence driven biases (loss aversion, mental accounting, hedonic editing, cognitive and emotional aspects, self control, regret, money illusion)

During the last years, a lot of models starting from the predominant theoretic approach from the quoted papers were proposed. One could notice the behavioural models based on artificial financial markets (ACE: agent-based computational economics) proposed by Pidd[42], Boer-Sorban, de Bruin and Kaymak [8], Tesfatsion and Judd[52], LeBaron [32], Hommes [24], Lovric, Kaymak and Spronk [34]; Chan, Frankel and Kothari model [11] which validated one of the most important bias in behavioral finances called representativity, Mei, Wu and Zhou [38] model which tested the capital market manipulation determined by driven euristics biases, for the first time on the American market; Lo[33] model where the individual investor adapt their decision to the environment changes using heuristics (AMH-Adaptative Markets Hypothesis), Fernandes, Pena and Tabak[16] model of optimal portfolio based on psychological factors influence; Baker and Wurgler[3] model which proposes a way to measure the investors feelings and test it on the main speculative events in the last 40 years, SAD model (Kelly and Meschke[29]) which tests the seasonal effects on the investors attitude.

3. INVESTMENTS DECISION: FUNDAMENTAL AND BEHAVIORAL DETERMINANTS

Our decisions are all the time a subject for very different questions: why to do this, what do I gain this it will be enough for me, what do I have to loose...?.The investments are no different. Beside the two major determinants of the investment decision (return and risk) present in the traditional economics, the behavioural finances introduce a new line of thinking which takes into account some very important elements: the human nature, cognitive and emotional predispositions.

To adress this complexity, the question of investor decision will be analised on a couple of different but likely independent sub questions:

- profiling investors regardin on their preferences and risk attitude
- portfolio construction and management
- investor's personality
- role of emotions, sentiments and intuition
- biases induced by heuristics and other departures from rationality

3.1.Risk attitude

One of the pillars concepts for investments and decision making in general is the concept of risk. In the traditional theories risk is determined using both the deviations from the average return and the probability of those deviations. Next to volatility, other measures used during time are downside risk, shortfall probability and Value-at -Risk. First step needed in order to discuss the influence risk have in fundament the investment

policy is creating the demarcation line between risk and uncertainty. When is a decrease in asset prices risky? Until when uncertainty is and where the risk starts? The answer is pretty simple. If one anticipates a price increase without any action, one can say that there is an uncertainty regarding the correctness of the anticipations. But, if based on these anticipations one decide to buy these stocks a risk could emerge as a result of an adverse evolution in the market, opposite with the forecasted one.

An investor attitude toward risk could be characterized as: risk-aversion, risk-seeking (risk-tolerance, risk-taking, risk loving) or risk neutrality. This attitude is influenced by several factors: the competition and collaboration between the cognitive and affective system (Lowenstein[36], Camerer[10]), demographic factors as age (Byrnes [9]) and the temporal perspective (Jaggia and Thosar [26], Gilovich [19]).

The competition and collaboration between the cognitive and affective system. Cognitive system is assumed to treat risk in a probabilistic manner, similar with traditional choice theory. One could notice that risk averse behaviors is determined by fear and anxiety responses to risk and the stored pain of experienced losses. Also risk seeking behavior is determined by the pleasure of gambling because ones emotional responses depend on mental images of outcomes, whereas they tend to be insensitive to probabilities.

Demographic factors as gender or age induce important shifting in risk attitude. Byrnes [9] validates for example in this study the assumption of a higher propensity for taking risk in male investors and found that this tendency of the gender gap to decrease with age.

Other important factor is represented by the *temporal perspective*. The investors' confidence in their prospect for success decreases as they come closer to the investment liquidation date so usually the risk assessment is more conservative with shorter temporal distance that in longer term investments. Also Jaggia and Thosar [26] argues that "risk perception is not only a function of age (and other cross-sectional idiosyncratic factors) but also of temporal distance between the initial investment point and the cash-out point typically represented by the individuals retirement"

3.2.Portfolio construction and management

The main difference between Modern Portfolio Theory provided by Markowitz and behavioral finance is represented by the perspective they use. First of them creates the foundation of *portfolio allocation* from a normative point of view based on the concept of diversification. Behavioral finance treats portfolio allocation from a descriptive perspective, studding how the investors are actually choosing the portfolio assets.

Rather than efficiently diversifying the portfolio, a large number of investors decide to allocate their resources through a naïve diversification strategy (Benartzi and Thalet [7], Huberman and DeMiguel [25]) spreading the investments evenly across available investment possibilities. Naive diversification does not imply any coherent decision or diversification making. Also, despite of the internationalization of the capital markets and the obvious advantages of an internationally diversified portfolio only a small number of investors are choosing not to concentrate their investments in their domestic market (*home bias*). The investors usually prefer to buy what they know allocating resources for stocks that are visible in investors' lives and are discussed in a favorable manner (*familiarity breeds investment*)

There are at least two important findings of the behavioral finances in the portfolio management area. A first common tendency is to hold losers too long and sell winners stocks too soon *disposition effect* (Shefrin and Stateman [48]).This investor behaviour is

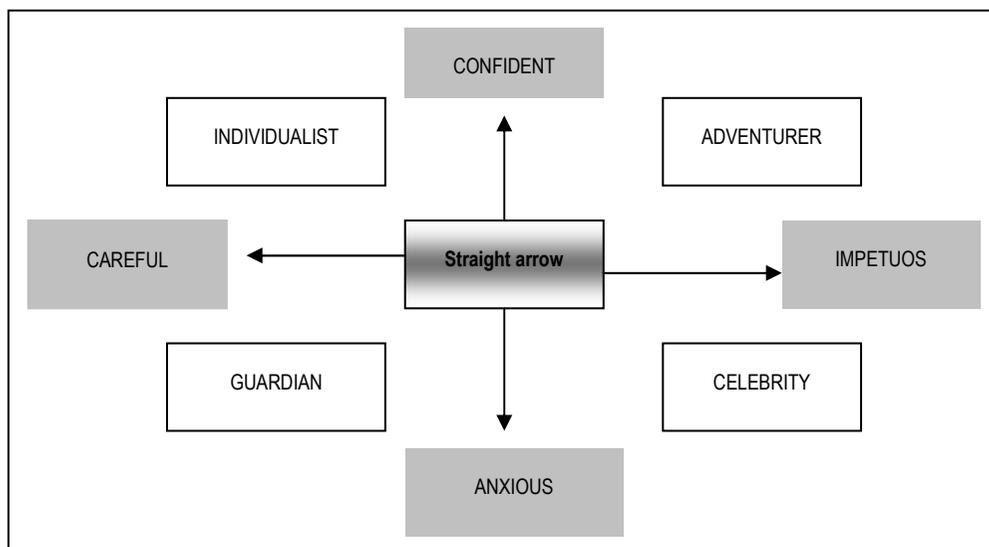
motivated by *overconfidence* and to the *self-attribution bias* (the belief that their trading success should be attributed mostly to their own abilities. Second, while some investors trade too much other are doing nothing and are maintaining their previous decisions - *status quo bias*. This bias is strongly related to loss aversion because the current position is used as a reference point. The investor prefers to maintain the position rather to change it and to risk an decrease in his portfolio value.

3.3. Investor's personality

Psychological literature on personality includes several psychographic models as Barnewall Two-Way Model[4] , Bailard, Biehl and Kaiser Five-way model[2], Digman five-factor model[13].

Barnewall distinguished between two basic investor's types: active and passive investors. An *active investor* is an individual who have higher tolerance to their risk than they have need for security because they believe in themselves. Usually those individuals have earned their own wealth in their lifetimes and understand to completely involve in their investment starting with choosing the asset and continuing with a permanent involvement seeking risk reducing. A *passive investor* has a greater need for security than they have tolerance for risk. Usually the lack of resources give individuals a higher security need so in this case is more likely the person is to be a passive investor.

Bailard, Biehl and Kaiser Five-way model uses two dimension of analysis in order to capture and classify the investors' personality: *level of confidence* and *method of action* as one can see in the graphic representation provided by their model, listed below:



Source: Thomas Bailard, David Biehl and Ronald Kaiser – *Personal money management*, 5th ed. (Chicago: Science Research Associates, 1986)

Figure no. 1 Bailard, Biehl and Kaiser Five-way model - Graphic Representation

The first dimension deals with how confidently is the investor's approach to his carrier, his health, his money. The second one deals whether the investor is methodical, careful and analytical in his approach to life or weather he is emotional, intuitive and

impetuous. These two axes of individual psychology determine five investor personality types:

- *the individualist*: they are trying to make their own decisions, having a certain degree of confidence but being also careful, methodical and analytical
- *the adventurer* – they are always willing to put everything on one bet because have confidence in them
- *the celebrity* – they want to be in the middle of the action and do not miss it even if they do not have a clue about why investing
- *the guardian* – they are not interested in volatility because are careful and a little bit worried about their own money. Because of their lack confidence in their ability to forecast the future they often look for guidance
- *the straight arrow*- an average investor, extremely balanced who cannot be placed in any of those groups presented above.

Digman model distinguishes between five personality types: extraversion, agreeableness, conscientiousness, neuroticism and openness but does not lead these to a certain investment politics. A large part of the behavioral biases come from the investor's personality. At the capital market is common to say that the investor personality is the cause of losing money not the market. That was a key finding of a study done by the research firm of Mathew Greenwald & Associates Inc for Merrill Lynch Investment managers. Merrill divided investors into four distinct personality types: *measured investors, reluctant investors, competitive investors, unprepared investors*

Measured investors are secure in their financial situation and confident they will have a comfortable retirement. Least likely to say that they waited too long to start investing or that they haven't invested enough, these investors are the last one plagued by emotions such as fear and anxiety that commonly cause investment mistakes. The most common mistake is not letting go of losing investments.

Reluctant investors do not particularly enjoy investing and prefer to have a financial adviser in order to spend as little time possible managing their holdings. This kind of investors is least likely to become overly attached to an investment or to put much money into a single holding.

Competitive investors enjoy investing, are informed and try to beat the market. They start investing early, invest regularly but can have hard time letting go of losing investments, often dedicate too much of their portfolio to one stock or investment and tend to be greedy and chase hot stocks.

Unprepared investors are characterized as unhappy with their financial situation and lacking in confidence. They tend to invest late and are at least likely to rebalance their portfolios.

The influence of investor's personality over its decision was recently examined by several researchers. Fenton-O'Creevy (17) conducted a study among 118 professional traders employed in investment banking institution that showed that successful traders tend to be emotionally stable and open to new experiences. Contrary to those results, Lo(33) argues that "this raises the possibility that different personality types may be able to function equally well as traders after proper instruction and practice. Alternatively, it may be the case that individual differences pertinent to trading success lies below the level that can be assessed through personality questionnaires, and may become visible only at deeper physiological and neuropsychological levels, or with a larger or more homogenous sample of traders"

3.4 Emotions, sentiments and intuition

Emotions can be considered a cause but also an effect of investment decisions. Positive emotions could lead to an increased creativity and information integration but could determine overestimation of the likelihood of favorable events and underestimation of the negatives ones. Negative emotions promote narrowing of attention and reducing searching for alternatives. One of the most studied feelings related with the investment process is the feeling of regret. Gilovich and Medvec[19] argued that this feeling is different regarding the time perspective: on a short run people experience more regret for actions rather than inaction, while in the long run they experience more regret for their inactions.

A new risk approach “risk as feelings” hypothesis asserts that emotional reactions to situations involving uncertainty of futurity often radically differ from cognitive assessments of those situations (Shiller [50]). Because we are human all our decisions including the financial ones are governed by emotion, by feelings. Too many times on the capital market the investor reaction does not come from a coherent analysis but from how they perceive the opportunities and the financial threats. The investors’ position in market from a psychological point of view could be seen as a perpetual cycle. Each time when a bull market is started a new cycle is initiated as one could see in the next figure

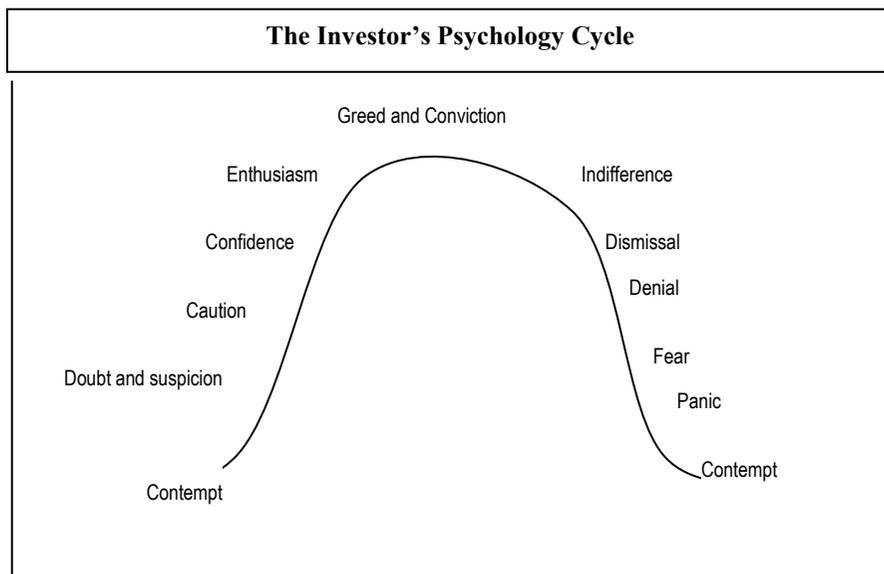


Figure no. 2 Various emotional states during profit-and-loss cycles

Contempt: a bull market starts when market is at a low and investors scorn stocks

Doubt and suspicion: the investors are trying to decide if to invest what they have left in low risk instruments as money market fund or not, because they lost a lot with stocks and they do not want to loose again

Caution: now, the first sighs of market recovery are seen. Most investors stand in the same position but prudent investors are already drooling at the possibility of profit

Confidence: usually in this stage, due to the stock price raise, the investors' feeling of mistrust changes to confidence and ultimately to enthusiasm. As a result most investors start buying their stocks at this stage

Enthusiasm: in this stage smart investors are already starting to take profits and get out of the stock market, because they realize that the bull market is coming to end

Greed and conviction: now investors' enthusiasm is followed by greed

Indifference: investors look beyond unsustainably high price-earnings ratio

Dismissal: at the market declines, investors' lack of interest turns into dismissal

Denial: usually at this point investors regularly affirm their belief that the market definitely cannot fall any further

Fear, panic and contempt: concern starts to take a hold and fear, panic and despair soon follow. Investors again start scorning the market and once again they vow never invest in stocks again.

3.5. Heuristics and biases

Heuristics are rules of thumbs, procedures used for processing information and reasoning often based on trial and error, useful to make cognitively difficult task easier. However, they can also lead to systematic biases. Researchers distinguish a long list of specific biases, applying over 50 of these to individual investor behavior.

Most discussed heuristics and biases are listed below:

- overconfidence
- representativeness
- anchoring and adjustment
- availability
- mental accounting
- loss aversion
- framing

Maybe the best definition of *overconfidence* is offered by Daniel Kahneman, the Nobel Prize winner for economics who has described as a tendency to construct forecast that are "too rosy". It is easy to see how overconfidence pervades the stock market. In the first place money managers and advisors are paid for their expertise and "their superior skills". Unfortunately in real terms only half of them consistently perform above average peer benchmarks. In the investor case, overconfidence plays out in other ways, such as chasing short-term performance and hot asset classes. The sentence "It's different this time" is the foundation rock of an overconfident investor. The late 1990s "TMT" bubble—the surge in technology, media and telecommunications stocks could offer us a classical example of market psychology driven by overconfident forecast. The subprime crisis from USA was in part due to problems of outright fraud and market manipulation but the greater driving forces was an all-too-human skill at creating overly optimistic forecast.

In order to derive meaning from their life experience, people are used to classify objects and thoughts. If something new appears they are tempted to those the classification anyway despite the inconsistency of the new phenomenon with any of their preconstructed classification (Pompian [43]). *Representativeness* heuristic is a judgment based on stereotypes (Shefrin [45]).

Anchoring and adjustment is a psychological heuristic that influences the way people intuit probabilities. Usually if someone is asked to estimate a value with unknown magnitude, he/she begin by envisioning some initial default number which serve as an

“anchor” and after adjust it up or down in order to reflect the subsequent information and analysis.

Availability is a judgmental heuristics where the frequency/probability of a class/event is assessed on how easy is to recall its instances (retrievability), how easy it is to mentally construct its instances (imaginability) and how easy it is to associate two instances (illusory correlation) (Tversky and Kahneman [53])

Mental accounting describes people’s tendency to categories and evaluate economic outcomes by grouping their assets in a number of nonfungible mental accounts. Shefrin and Thaler[45] argued that people mentally allocate wealth over three classifications: current income, current assets and future income. The propensity to consume is greatest from the current income account while the future income is treated more conservatively.

If market actors overreact on optimistic side in bull markets it seems that the overreaction is more profound in periods of bear markets. Researchers have noted a psychological tendency toward **loss aversion** – a tendency to overweight losses relative to gains. In psychological terms is twice painful to lose a dollar than the pleasure to gain one. Loss aversion appears to be at the root of many of the worst types of investment behavior: selling out of the market entirely; abandoning asset classes based on short term returns, focusing on specific losing investment rather than on overall portfolio performance.

Framing consist in the tendency of the decision makers to decide differently depending on the context in which a choice is presented (framed). The frame that a decision maker uses is controlled partly by the formulation of the problem and partly by the norms, habits, and personal characteristics of the decision maker.

4. CONCLUSIONS

One could conclude that the investment process is driven by dual mental process, both cognitive and affective. Is a continuous war between emotion and discipline, between our present –day selves, looking for a winning strategy today and our future-oriented selves, striving to be patient about long-term thinking and investing. When people are too much “in the present” they become impatient and swept up in market swings. When people think at long term, they tend to make more prudent choices for their futures.

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