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INVESTOR'S BEHAVIOUR: A CONCEPTUAL FRAMEWORK

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Abstract: *This article aims to provide a more comprehensive analysis of the investor's behaviour. To do so, we first address the concept of individual behaviour which lacks a rigorous, precise definition that would be unanimously accepted. The multidimensional nature and complexity of the human behaviour is approached from both a psychological and a financial point of view, by examining its relationship with the genetic structure, the psychic structure and the social environment. Secondly, we investigate the concepts of homo economicus and homo sapiens related to the traditional economic models, and to the behavioural finances approach, respectively, highlighting the "normality" of the investors, who cannot be limited to mathematical policy models. At the same time, we stress the importance of the evolution of homo economicus along with the constantly developing environment and the new challenges and changes faced by the financial markets.*

Key words: *behaviour, rationality, human cognition, emotions.*

1. Introduction

The investor's behaviour has been extensively studied throughout the literature (Kahneman and Tversky, 1973; 1974; De Bondt and Thaller, 1985; Daniel, Hirshleifer and Subrahmanyam, 1998; Thaler, 2000; Shiller, 2000; Barber and Odean, 2000; 2001; Barberis and Thaler, 2003; Hirshleifer and Shumway, 2003; Kamstra, Kramer and Levi, 2003; Frieder and Subrahmanyam, 2005; Camerer and Loewenstein, 2004; Evans, 2006, etc.). It is an essential factor which exercises great influence on firms' performance, on stock markets and on the financial markets as a whole, given the existence of different types of investors who behave in a distinct manner when confronting with investment decisions.

In order to properly explain the investor's behaviour and its implications on the financial markets, we must first address human behaviour. Even though a significant body of literature has dealt with the concept of behaviour within various fields of study

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(such as psychology, cognitive psychology, artificial intelligence, economics, or finance) and there have been numerous attempts to explain human behaviour, no consensus has been reached until now, as per our knowledge, with respect to a rigorous, precise definition that would be unanimously accepted among academics and practitioners alike. Hence, the second section of this paper provides an understanding of the multidimensional nature and complexity of the human behaviour, which we seek to explain from a psychological and financial point of view, in conjunction with the genetic structure, the historical origins, the psychic structure, the emotional mind and the social environment.

Furthermore, taking into account the two significant approaches within the financial field, the traditional finance and the behavioural finance, the investor's behaviour can be described by referring to two concepts that encompass the nature of each branch: homo economicus on one hand, related to the traditional economic models, and homo sapiens on the other hand, related to the behavioural approach. The third part of this article deals with the behaviourally incomplete theories and models of the traditional finance which the behavioural finance aims to complete. While homo economicus relies on the assumptions of rationality, having the ability to make rational decisions at all times, pursuing the maximization of his utility, homo sapiens relies on the assumptions of bounded rationality, sophistication and human nature confronting with environmental factors, market interactions between various types of agents, human cognition and emotions. The investor's behaviour is subject to behavioural and cognitive biases, as well as to emotions, which ultimately impact the financial decision-making process.

The goal of this article is to provide a better understanding of the investor's behaviour, attitude and psychological processes through a conceptual framework, and emphasize the importance of these elements combined with the traditional approaches when analysing any economic event or market conduct. In a constantly developing environment and financial markets facing new challenges and changes, the limitations of the homo economicus model make it impossible to provide reliable and accurate explanations of the evolving market phenomenon and behaviour only by itself, and thus it is important to undergo itself an evolutionary process. Hence, incorporating homo sapiens into the traditional economic models would help increase the explanatory power of the models.

This paper is divided into four parts, the remainder being structured as follows. The second part provides a conceptual framework for the individual's behaviour. The third section addresses the investor's behaviour and examines the concepts of homo economicus and homo sapiens. Lastly, the fourth part presents the conclusions.

2. Defining the Concept of Behaviour

In order to properly define the investor's behaviour, we must first understand the human behaviour and its main triggers.

Even though the concept of behaviour has been heavily utilized and examined in relationship to other parameters, no consensus has been reached with respect to what behaviour itself really means.

Taking as reference psychology dictionaries, the definition of behaviour is often limited to obvious observable activities. For example, in one psychology dictionary the term is explained through "the activity of an organism as a result of the interaction with the environment in which it is located" (Doron and Parot, 1999). The Oxford Dictionary of Psychology provides a similar interpretation: "the physical activity of an organism, including overt bodily movements and internal glandular and other physiological processes" (Colman, 2006). In contrast, the American Psychological Association Dictionary of Psychology provides two definitions of the term (https://dictionary.apa.org/behavior). One "restrictive" explanation is "any action or function that can be objectively observed or measured in response to controlled stimuli". The other "broader" definition is "an organism's activities in response to external or internal stimuli, including objectively observable activities, introspectively observable activities and non-conscious processes".

The concept of behaviour came more into light with Pieron (1908) and Watson (1913), being associated with the redefinition of the object of psychology proposed by Behaviourism. According to Watson and the American Psychological Association, human behaviour designates the way of being and acting through observable manifestations. Their behaviourist theory focused on external and outward behaviour, rather than emotions and psychological conditions of the individuals, believing that the human's physical response was the sole provider of any insights into internal activities. Thus, they limited the behaviour notion to any activities of the human body which are directly observable and excluded the consciousness, thoughts, feelings and other internal activities.

The behavioural approach of Pierre Janet (1930), one of the founding fathers of psychology, was less restrictive than the one proposed by the American Behaviourism, analysing the concept of behaviour in a broader sense, linking it with the psychology of conduct. The notion of conduct concerns any activity in its entirety: there is the internal form (subjective) and the external form (which involves the reflex actions), hence taking always into consideration the unity of the mental, reflex and motor factors. Janet's work was an experimental synthesis linking the fields of cognitive psychology, social psychology and dynamic psychology. He defined the concept of behaviour by including elements like emotions, cognition, attention, action and social factors, believing that one's individual mental tendencies are forming a basis for his behaviour.

Though there have been attempts to use and apply a wider definition of the human behaviour and not reducing it only to biological states of affairs, no rigorous formulation of the concept has reached any consensus so far, as per our knowledge.

A more comprehensive framework of the concept of human behaviour using a parametric analysis was provided later on by Ossorio (1969; 1973; 1985; 1995) who proposed a definition of behaviour through an eight-parameter set as follows:

$$\{B\} = \{I, W, K, K-H, P, A, PC, S\}$$

where:

- *B* is the human behaviour;
- *I* represents the identity parameter: the identity of the individual whose behaviour is analysed;
- *W* denotes the motivational parameter: "the want" of the individual in terms of the state of affairs towards which the individual tends;
- *K* marks off the cognitive parameter: what the individual "knows" or otherwise stated the concepts or the distinctions the individual acts upon;
- *K-H* is the competency parameter: the individual's know-how or abilities exercised in a certain time period and location;
- *P* represents the performance parameter: the physical processes of the behaviour (from the body posture/body processes to the actions and physical processes involved in the behaviour);
- *A* is the outcome parameter: the achievement or the outcome that may be in accordance with the motivational parameter (the want);
- *PC* shows the personal characteristics parameter: this includes and it is not reduced to personal traits, values, attitudes, abilities, knowledge, capacities, status etc.;
- *S* represents the significance parameter: referring to patterns of behaviour, the way in which an individual acts through the concrete things he or she is doing.

This conceptual framework has also been adopted by Bergner (2011), who states that "whenever is the case for a situation of a ‹behaviour› type, there is also a situation of each of the specified parameters' type".

An alternative, but similar approach is proposed by Malle (2006), encompassing the "deliberation" term into the definition of behaviour. According to the researcher, human behaviour can be considered as deliberate if several conditions are fulfilled:

- the individual desires a certain outcome;
- the individual believes that the action taken would help him reach the desired outcome;
- the individual has an intention to act for the desired outcome;
- the individual has the necessary skill to act for the desired outcome;
- the individual is aware while executing the action.

Another way to explain human behaviour is by referring to the individual as a living mechanism receiving information from his/her corresponding environment, processing it afterwards in different manners and deciding to act upon it. Two approaches were considered under this perspective. In the mid-20th century, the Behaviourism School channelled its attention on the way some certain stimuli are perceived through the individual's senses and producing an adaptive response (no brain processes were considered in this instance). Since the '60s-70s, the researchers in the psychology field shifted their focus to the human brain and its processes, laying the foundations for the cognitive psychology domain. The human brain was analysed from a computer point of view, the information received from the corresponding environment being categorized as "input" that was then processed and stored in different manners, ultimately leading to a visible behaviour categorized as "output". However, none of the two approaches

above is complete, one without the other. Reacting to the surroundings, the individual's behaviour is first confronted with the sensory perception (perceiving the world through sight, hearing, smell, taste and touch as well as through other sensory abilities like one's own perception), feeding then the information to the brain so that it can manipulate it and trigger a corresponding action (Baars and Gage, 2010). The nervous system cycles the information flows between the input and the output channels so that it maintains the sensory and motor functions in synchrony (Fuster, 2004). The most powerful sensory ability is however the sight, given that approximately ten million out of the eleven million sensory receptors in the human body are dedicated to sight, hence the visual cues represent the greatest catalyst of the individual's behaviour.

Historical origins and genetics are also important factors to take into consideration when defining the human behaviour, having a fundamental say into it (Birch and Hayward, 1994; Schore, 2015; Lees, et al., 2000; Freeman, 2004; Kandel, 2004; Pearson, 2006). Individuals in general are herd animals. They have basic needs to be fulfilled such as the desire of fitting in, bonding with their peers or earning and receiving respect and approval from their peers. These inclinations were essential for their survival and remained an important element throughout the evolutionary process. The lifestyle of our ancestors placed a fundamental role on being part of a tribe, this in turn granting access to resources, safety or mating opportunities, whereas separating from the tribe meant rejection, or in the worst case scenario, a death sentence. "In the long history of humankind, those who learned to collaborate and improvise most effectively have prevailed" (Charles Darwin). These individuals' ancient preferences have changed negligibly over the years and exert a powerful influence on the human modern behaviour. Moreover, this points out that individuals do not choose some of the earliest habits, but imitate them, basically following a script which has been handed down through history. Human differences are a consequence of the place of origin of one's recent ancestors (Birch and Hayward, 1994). Several psychological and brain variables are heritable, thus implying a biochemical individuality for every person; however, human brains are similar across the continents (Baars and Gage, 2010). The ancestors' experiences in dealing with various extreme weather conditions, diseases, social situations and nutrients are reflected in the modern individuals' external differences (Baars and Gage, 2010). Furthermore, each culture and group (society, local community, family and friends, work environment etc.) has a certain set of expectations, guidelines, standards. These social norms are also guiding and shaping human behaviour.

An important aspect standing out in the academic literature throughout time has been the terms and conditions under which human behaviour was approached. Depending on the subject of a certain field of study or on theoretical paradigms, the focus can shift from material and neuropsychological substrate (the behaviour as a result of neural chain associated with certain chemical messengers) to psychological mechanisms that support or determine a particular behaviour (the behaviour as a result of a learning process, needs, compliances or avoidances), or to the role of macro-social or cultural determinants in normal, respectively pathological behaviour (the behaviour as a result of social pressures).

Hence, in order to have a unified overview of the individual's behaviour, it is necessary to understand its multidimensional nature and complexity, to examine its relationship with the genetic structure, the psychic structure and the social environment. Acting on the basis of the same genetic structures can lead to different behaviours if being subject to different types of environment. Likewise, genetically different individuals, but subject to the same environmental influences, can lead to different behaviours. Thus, the human behaviour is a combination of the social, psychological and hereditary elements.

From a psychological point of view, human behaviour is a reflection of multiple layers (identity - forming on the basis of a set of beliefs, processes - representing a set of actions pursued taking into account the system of beliefs, desires, knowledge, skills or personal characteristics, and outcomes - the results generated by the set of undergoing actions), so the way to address it is by addressing each characteristic. The identity emerges out of the habits formed (these are the most important factors given their high frequency). Individuals are not born with pre-set beliefs, but each and every belief is learned and conditioned afterwards through experience. The habits' creation process begins with trials and errors. The individual analyses carefully the situation under hand and makes conscious decisions about the proper way to act, the brain accumulating the new pieces of information and learning the most effective course of action under that specific context. The human brain performs like a prediction machine, by evaluating the surroundings and analysing the information it comes across so as to automatically encode the lessons learned through experience. Thus, when facing something recurrently, it begins sorting through the details and highlighting the important cues and their corresponding outcomes, storing the data gathered afterwards for future use. If the situation repeats itself, then the individual may pick up on the cues that he already knows to predict the desired outcome, acting on the basis of his automatic and non-conscious mind. As a consequence, a significant part of the actions undertaken by individuals are shaped by the most obvious option and not by a purposeful drive or choice.

From a financial point of view, the individual's behaviour can be defined as the human behaviour closely related to money management (which involves four different areas: saving, consumption, borrowing and investments). At the same time, behaviour represents the individual's ability to understand and be aware of the overall impact of his financial decisions on individual circumstances and thus, making decisions about cash management, risk management, precautionary measures, or financial opportunities. By combining the two previous definitions, the financial behaviour encompasses the set of financial activities of the economic agent, activities which are based on the analysis of all available information and which seek to maximize his/ her utility, profit or well-being.

The financial behaviour plays a key role in influencing a person's well-being, a household's well-being, a society's well-being, a nation's well-being or even the world's well-being in general. The display of the individual's financial behaviour depends on a series of factors, as previously seen, such as identity, desire, knowledge, performance, personal characteristics or psychological factors (Bergner, 2011; Garcia, 2013). Moreover, this financial behaviour is closely related to the individual's attitude towards risk, time horizon, his perceptions or different forms of cognitive biases that lead him to

bounded rationality (Lusardi and Mitchell, 2011; Meier and Sprenger, 2013). In addition to this, the sensory signals received by each individual's brain generate distinct emotional conditions, under which they may process the information received about likely risks differently, ultimately influencing the economic agent's financial decision (Kuhnen and Knutson, 2011).

3. Investor's behaviour - Homo Economicus versus Homo Sapiens

When addressing the investor's behaviour, two perspectives can be distinguished based on the two approaches within the financial field: the traditional finances and the behavioural finances. On the one hand, the traditional finances' approach is a normative one, explaining the way in which the rational agents make investment decisions aimed at maximizing their utility. On the other hand, the behavioural finance approach is a descriptive one, trying to analyse and understand the psychological phenomenon that exercise an influence over the agents' investment decisions. Thus, it examines the "real world" events by looking at the individuals' behaviour. The investor's behaviour is dependent on the individual's interpretation of the events that are happening to him and not necessarily the objective reality of the situation itself. These assumptions lead to feelings and emotions that help understand what the individuals are sensing, as well as how they are acting through either holding steady in their current state or making a change, ultimately representing an important factor in the decisional process with respect to the best course of action. The impairment of emotions and feelings contributes to a diminution of the ability to reach decisions according to neurologists, as "it is the emotion that allows you to mark things as good, bad or indifferent" (Bechara, et. al., 2000).

Connected to each of these approaches are two concepts that briefly describe the investor's behaviour. Firstly, there is *homo economicus,* a concept which has been intensively used in traditional economic models. Secondly, there is the *homo sapiens* concept (or the *evolved homo economicus*), which is linked to the behavioural approach, highlighting the "normality" of the investors, who are after all human beings that cannot be limited to mathematical policy models or to certain pre-set standard models (such as "money making animals" – Ingram, 1888; individuals "whose activities are determined solely by the desire for wealth" – Keynes, 1890).

The notion of homo economicus has been first introduced by Mill (1848) who described him as an individual who is "determined by the necessity of his nature to prefer a greater portion of wealth to a smaller one," and moreover, he is "able of judging of the comparative efficacy of means of obtaining the possession of wealth" (Pribram, 1983).

The Homo economicus has been created based on the assumptions of rationality, thus he can be shortly defined as the economic man who is able to make rational decisions at all times, pursuing the maximization of his utility. In a broader sense, homo economicus is characterized by self-control in order to pursue his/ her long term goals rather than being satisfied on the short term, designing the optimal consumption plan that would help him/ her maximize his/ her expected utility over his/ her life span. Moreover, he/

she optimizes the decisions related to expenditure or investments, regardless of the source of wealth. Investment wise, homo economicus does not dissociate the investments based on their purpose, but rather sees them as a whole, as a portfolio (taking into account the correlations between assets in order to construct the optimal portfolio).

According to Thaler (2000), homo economicus is distinguished through self-interest, seeking utility maximization, while having precise and consistent preferences, as well as symmetric information (Thaler, 2000). These assumptions about the economic man laid the foundations of the theory of rational choice/expectations. In a similar manner to describing homo economicus through the axioms of expected utility (homo economicus making rational investment decisions under risk conditions), the rational decision maker is characterized by Von Neumann and Morgenstern (1953) through mathematical axioms that encompass "completeness (well-defined preferences), transitivity (consistent preferences), continuity (any separation in preference can be maintained under a sufficiently small deviation in probabilities) and independence (preference is independent of the possibility of another outcome)".

Thaler (2000) questioned the homo economicus standard model which takes into account parameters like full rationality, absolute cognitive capacity, the ability of being a quick study ("the agents who are assumed to solve the relevant problem correctly on trial one") as well as perfect access to information and perfect competition within a static environment.

However, within a constantly developing environment and financial markets facing new challenges and changes, homo economicus has undergone itself an evolutionary process. Thus, Thaler (2000) introduced the notion of homo sapiens to explain the evolution of homo economicus. The homo sapiens conceptual framework takes into account some key characteristics like bounded rationality ("quasi-rationality"), sophistication, allocating a more important role to environmental factors, market interactions between various types of agents, while also including human cognition and emotions.

Given that economic agents do not always act upon following self-interest, nor being fully informed at all times, homo economicus does not stand out as a realistic form of human behaviour. The human nature is confronted with inherent deviations that may prevent the objective of utility maximization (the individuals make judgements and calls under the influence of aspirations and emotions) (Kahneman and Tversky, 1973; 1974; Camerer and Loewenstein, 2004).

Investment wise, homo sapiens tends to design his/ her investment portfolio on several layers based on his/ her objectives (not necessarily taking into account the correlations between assets, or between layers) and safety constraints. Therefore, the optimal investment portfolio is more like a combination between risk-free assets, lower risk assets (in order to finance his/ her most critical objectives) and higher risk assets (in order to finance his/ her aspirational objectives).

Considering an unstable and unpredictable environment, behaviours are also unstable and unpredictable. As a result, the investor's behaviour is subject to behavioural biases, as well as to cognitive biases and emotions, which ultimately impacts the financial

decision-making process. Investors may be: overconfident (Daniel, Hirshleifer and Subrahmanyam, 1998; Barber and Odean, 2000; 2001; Evans, 2006), risk averse (Statman, 1999), loss averse (Kahneman and Tversky, 1979; Kahneman, Knetsch and Thaler, 1990; Shiller, 2000), subject to the anchoring bias (Hvide, 2002), subject to the availability bias (Kahneman and Tversky, 1973), subject to the mental accounting bias (Shiller, 2000; Barberis and Thaler, 2003), subject to the representativeness bias (Kahneman and Tversky, 1974; De Bondt and Thaller, 1985), subject to the herding bias (Allsopp and Hey, 2000), subject to the familiarity bias (Frieder and Subrahmanyam, 2005). Furthermore, a significant effect on the investor's decision-making behaviour can also be attributed, but not limited to social interactions (Shiller, 1990) or mood (Hirshleifer and Shumway, 2003; Kamstra, Kramer and Levi, 2003).

All in all, homo sapiens seems to be better rooted in the current reality than his "predecessor", homo economicus, and provides a more realistic overview of the economic agents and their corresponding behaviour, contributing to a better understanding of the financial markets.

4. Conclusions

Understanding the investor's behaviour and decision-making patterns becomes easier with the integration of psychology into the traditional finance concepts. In an evolving environment and new challenges arising into the financial markets, the limitations of the traditional finance models (the homo economicus model) make it impossible to provide reliable and accurate explanations of the evolving market phenomenon and behaviour only by itself, thus it is important to undergo itself an evolutionary process. Hence, incorporating the behavioural approach into the traditional economic theories and models would help increase the explanatory power of the models. Moreover, the updated version of homo economicus, namely homo sapiens, is better correlated with the reality nowadays, bringing to light a more realistic overview of the economic agents and their corresponding behaviour.

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