

# **BEHAVIORAL FINANCE AND DATA ANALYTICS SERVING FINANCIAL ADVISORY SERVICES: An empirical study regarding investor profile identification**

Inés Lacalle Álvarez<sup>1</sup> and María Coronado Vaca<sup>2</sup>

Universidad Pontificia Comillas-ICADE

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## **ABSTRACT**

Human behavior undeniably plays a dominant role in investor returns. Proof of this is that investors consistently underperform their funds, which has been referred to as the “behavior gap”. Behavioral Finance findings are reflected in the performance of mutual funds in Spain, as can be seen in the empirical analysis conducted in this paper. Though there is extensive literature on the biases affecting investors’ decisions, professional advisors lack the appropriate tools and protocols to detect those biases and integrate them into the investor profile definition process, around which the investment strategy itself will pivot. Hardly will we be able to optimize asset allocation if the investor profile is not accurately determined. This paper gathers several proposals for the introduction of data analytics techniques in financial advisory, benefiting both clients and advisors, the former by enhancing their investment returns, and the latter, by consolidating long-term relationships with their clients.

**KEYWORDS:** Behavioral Finance, investor, bias, profitability, data analytics, big data.

Along with the abstract we can also advance the introductory section and the index of the empirical study. The paper is about to be finished (in two more weeks): It is just a matter of formatting aspects. Thank you.

**PD PARA EL PORTAL DE MOVILIDAD: EL TRABAJO ESTÁ FINALIZADO Y DE HECHO ESTÁ PRESENTADO EN CONVOCATORIA ORDINARIA (TFG ADE) Y SUBIDO A REPOSITORIO. SOLO NOS QUEDA TERMINAR DE “RESUMIRLO” Y DE TRADUCRILLO AL INGLÉS.**

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<sup>1</sup> [ineslacallealvarez@alu.icade.comillas.edu](mailto:ineslacallealvarez@alu.icade.comillas.edu)

<sup>2</sup> [mcoronado@icade.comillas.edu](mailto:mcoronado@icade.comillas.edu)  
Alberto Aguilera 23. Madrid (28015) Spain.

## **1. INTRODUCTION**

### **1.1. Objectives**

It is generally accepted that investors are affected by biases, many of them unconscious, in their decision making, with evident implications on their investment performance. The analysis of these biases in each individual client is of utmost importance in order to determine the risk profile of each investor precisely. This paper aims to bring previous Behavioral Finance contributions to the practice of financial advisory, prompting reflection on the possibility of using data analytics techniques in the process of client profiling.

The empirical analysis conducted is born out of the desire to detect the existence of biases in the behavior of Spanish investors, through Inverco's<sup>3</sup> data on Spanish investment funds, for a period from 2005 to 2020. Accordingly, three main hypotheses related to investor reactions to moments of high volatility and uncertainty in markets will be tested.

Rather than limiting our research to the mere finding of the practical relevance of the subject matter, it seems far more fruitful to go a step further and propose, as is done throughout the paper, considerations that financial advisors could incorporate in the process of determining their clients' profile. A deeper and more detailed insight into the investor profile would enable more personalized investment advice, tailored to client needs, thus enhancing the value proposition offered to them. The Big Data universe remains unexploited, while the adoption of data analytics techniques becomes increasingly attractive for financial institutions and asset managers. Data analysis, together with Behavioral Finance contributions, would allow us to detect and, consequently, correct, client biases when they were to take place.

The columnist Nick Murray (1999) explained that we, as investors, hire a financial advisor not to manage our money, but to manage ourselves. To this idea, we shall add that in order to manage, one must have knowledge, hence insisting on the need to develop the appropriate tools to achieve a better understanding of client behavior, contributing to the progress of financial advisory. Our objective is, thus, to make concrete proposals in

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<sup>3</sup> Inverco is the Collective Investment Undertakings and Pension Funds Association, which brings together almost all Spanish Collective Investment Undertakings (Funds and Investment Firms), Spanish Pension Funds, and foreign Collective Investment Undertakings registered with the CNMV for commercialization purposes in Spain, as well as several Associate Members.

this regard, based on data analytics techniques and following the empirical detection of biases in Spanish investors.

## **1.2. Research justification**

An accurate identification of investor profile is an essential prerequisite for optimal asset allocation, considering the investor's financial situation, needs and investment objectives. For this purpose, asset managers and private bankers use the so-called "Suitability Assessment", a test that clients must undergo before the company can provide its services, which constitutes an imperative requirement in Europe, as set forth in MiFID Regulation<sup>4</sup>. In this test, clients are asked about their capacity to withstand losses, the return they expect to obtain, how they would react to certain market situations, or what they intend to achieve with their investment. The investor profile would be perfectly delimited with these questionnaires, were it not for the fact that clients, in reality, are rarely accurate at predicting their own behavior in the face of market ups and downs.

The renowned economist Benjamin Graham (2009, p.21), considered the father of value investing, argued that "the investor's chief problem, and even his worst enemy, is likely to be himself". This refers to an investor's tendency to impair, through their own behavior, the performance of their investments. In the 1980s, the market efficiency hypothesis began to be questioned, shifting the academic debate away from traditional economic theories and towards the development of models that combined human psychology with economics and the functioning of financial markets. Thus, interest in the analysis of the behavioral biases that affect human beings in decision making arose, opening the way, at the beginning of the 1990s, to the field of Behavioral Finance. This discipline accounts for all those situations in which it becomes evident that investor behavior is not as rational as had been assumed in the past.

Although there is extensive literature on this topic, the business world has not yet embraced its findings in practice, or at least not in a widespread manner. Data analytics, one of whose strengths is detecting trends and behavioral patterns opens up infinite possibilities in relation to the identification and measurement of behavioral biases that influence investment decision-making. In this context, it is of interest to analyze the relevance of Behavioral Finance theories in the financial advisory industry, particularly in our case applied to mutual funds, as well as to propose possible measures to be

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<sup>4</sup> MiFID stands for Markets in Financial Instruments Directive.

undertaken by financial advisors to begin to translate such valuable contributions into business practice.

### **1.3. Methodology**

Given that the paper's first sections are essentially theoretical, while the last one is mostly practical, we shall define the methodology used in each part separately. The theoretical sections entailed an exhaustive literature review of Behavioral Finance contributions, both at a general level and, in particular, referred to the asset management field, in which the paper is framed.

The practical section consists of an empirical analysis, in which the validity of a series of hypotheses related to the rational investor behavior is tested, the rejection of which would support the Behavioral Finance theories. For this purpose, ideally we should have access to the suitability test completed by clients before the company can provide its services for its profile identification, as well as the clients' historic data regarding investment movements, in order to detect possible inconsistencies between what was initially determined in the test and what was subsequently acted upon. Due to the lack of availability of real personalized data, in a sector where client data will be highly confidential, we work with public data from different categories of mutual funds in Spain—Monetary, Euro Short-Term Fixed Income, Euro Mixed Fixed Income, Euro Mixed Equity, Euro Domestic Equity and U.S. International Equity Funds— from the Inverco database.

Although we will refer to section 4.2. for more detail on the methodology used in the empirical analysis, it is worth mentioning here that we will establish an assimilation between the aforementioned categories of mutual funds—with different risk-return ratios—and certain investor profiles—from conservative to aggressive, following the classification used by most financial institutions and asset managers—. Each investor type is assigned the asset class they would most likely include in their portfolio, based on their greater or lesser risk aversion and the return they expect to obtain. This assimilation will allow us to analyze how investors with different profiles react to certain market conditions. Particularly, we examine funds' performance from 2005 to 2020, with particular emphasis on the interactions between the return obtained by the fund and the number of subscriptions and redemptions recorded, paying special attention, as mentioned above, to high volatility periods.

## **1.4. Organization**

This paper is structured in three main sections.

First, we present the theoretical framework regarding investor profiling in financial institutions and asset management firms and, in particular, the obligation imposed by MiFID Regulation to carry out a suitability and/or appropriateness test.

The second section is devoted to investor behavior and is, in turn, divided into three distinct parts: firstly, we dive into some of the main biases and heuristics that the Behavioral Finance theories have been defining since the origin of this field of study; secondly, the most common poor investment decisions caused by the existence of the aforementioned biases are reviewed; lastly, we draw attention to the potential that data analytics offers in the process of investor profile identification.

The third section describes the empirical analysis conducted for mutual funds in Spain, as explained in the previous section, detailing the access to the database, the hypotheses raised and the results obtained.

Finally, we gather the main conclusions obtained, stating at all times the limitations of the study and the future lines of research that may arise from this paper.

## **4. EMPIRICAL ANALYSIS REGARDING MUTUAL FUNDS PERFORMANCE IN SPAIN BETWEEN 2005 AND 2020**

### **4.1. DATABASE**

### **4.2. METHODOLOGY AND MAIN HIPOTHESIS**

#### **4.2.1. Investor profile description**

#### **4.2.2. Data collection methodology**

#### **4.2.3. Hypothesis raised**

### **4.3. RESULTS ANALYSIS**

#### **4.3.1. First hypothesis: Hysteria**

#### **4.3.2. Second hypothesis: Euphoria**

#### **4.3.3. Recap: Chasing the market**

#### **4.3.4. Third hypothesis: diversification effect**

5. CONCLUSIONS

6. REFERENCES