



**Behavioural economics
for investor protection**
Practical recommendations for
investors, entities and regulators

María Eugenia Cadenas Sáez

Working paper
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1 Introduction

Since its beginning, traditional economic theory has addressed how people make their investment, saving and spending decisions. It is also based on the assumptions that people know what they want, use the available information to achieve their objectives and fully understand the risks and rewards of their financial decisions. In recent years, however, numerous discoveries from disciplines such as psychology, neurology or neurophysiology about how the human brain works have revealed that this is not the case. People often do not know what their preferences are, misuse available information and do not adequately understand the risks they take on.

Behavioural economics addresses this issue – real human behaviour in the real world – to develop more precise and practical economic models than those provided by neoclassical economic theory. Behavioural economics takes into account those subtle and not-so-subtle factors that underlie financial decisions. This discipline is an attempt to analyse the patterns and biases of people’s behaviour and use these as a base to predict behavioural models.

Research conducted in the area of behavioural economics shows that most of these patterns or biases are predictable. These findings open up new possibilities for a better understanding of investor behaviour and, therefore, supplement the existing regulation for their protection.

This aim of this working document is to present a series of proposals addressed to investors, entities and regulators that facilitate the practical application of the central premises of this discipline to investor protection. The fundamentals of behavioural economics will be discussed, followed by an analysis of its role in investor protection, and lastly, the main fields of practical application of the discipline in this area.

2 Concept and basic foundations of behavioural economics

Behavioural economics gained particular relevance when the 2017 Nobel Prize in Economics was awarded to economist Richard H. Thaler, following the prize granted in 2002 to Daniel Kahneman, professor of psychology at Princeton University. Both authors highlight that in essence, people are not fully rational beings and that this limited rationality affects the behaviour of the markets.

The idea that people are not fully rational beings has long been known in fields such as psychology or advertising. However, economics has only recently started factoring in sociological, anthropological and psychological aspects to explain the functioning of markets and investor behaviour.

Therefore, behavioural economics has not arisen as a counterpoint to neoclassical economic theory but as a discipline that complements and enriches it by contributing knowledge from the fields of psychology, neuroscience, anthropology and sociology to better understand the economic decision-making process of individuals. In the words of Richard Thaler, behavioural economics *has provided economists with a greater wealth of analytical and experimental tools to understand and predict human behaviour.*

The main nuances that behavioural economics brings to neoclassical economic theory are as follows:

Premises of neoclassical economic theory	Premises of behavioural economics
Subjects are fully rational.	Subjects have limited rationality.
Subjects know what they want.	Subjects frequently do not know their preferences.
Subjects have unlimited cognitive capacity to fully understand the implications of each available option and adopt the one that maximises benefits.	Subjects have limited capacity for mental calculation and aspire only to make the most satisfactory decision and not the one that maximises benefits.
Subjects make their investment, saving and spending decisions using the information available in a way aimed at achieving their objectives.	Subjects usually make decisions considering social norms and expectations and following patterns of cooperation. Their preferences depend on the context they are in and their own mental models.
Their preferences are stable and consistent. They do not change or vary over time.	Individual preferences may change.
Individual preferences are not influenced by the subject's own decision-making history or by external factors such as social conventions, their environment or the media.	Humans are social beings who make decisions within the framework of a social context that has a decisive influence on the final decision.
Subjects are maximisers when making decisions, seeking to obtain maximum utility from their decisions. Maximisers compare all possible options to choose the best one.	Subjects are satisficers. Individuals lack unlimited information processing capacity and choose to make the most satisfactory decision, i.e., one that is good enough, but not necessarily optimal.
The decision-making process is based on careful analysis and calculation of all available options.	Behavioural economics believes that emotions and intuition play a fundamental role in the decision-making process.
The manner or framework in which the options and opportunities are presented should not affect an individual's decision-making. The choice of the best option should not depend on how the options are framed and, therefore, should be independent of the context in which it is made.	The context in which individuals make their decisions affects the way in which the options are considered. If the framework is changed, the choices made by the subject can change.

3 The financial decision-making process

3.1 General considerations

Decision-making is a process by which a person must choose between two or more alternatives. It can take place in any context of everyday life, whether personal or professional. The decision-making process involves both analytical capacity, i.e., the ability to evaluate and understand the context in which a decision is made and its possible repercussions, and emotions, i.e., the psychological state of the person making the decision.

Unlike neoclassical economic theory which contends that the decision-making process is based on careful analysis and calculation of all available options, behavioural economics argues that emotions and intuition play a fundamental role in this process. Therefore, neoclassical economics confers a predominant role on the rationality of the person over their emotional facet, while behavioural economics considers that the latter plays a leading role in decision-making.

In this regard, Daniel Kahneman, in his book *Thinking, Fast and Slow* (2011), distinguishes two thought systems: System 1 (fast thinking) that operates quickly and automatically with little or no effort and no sense of voluntary control, and System 2 (slow thinking) that involves mental activities that require effort (including complex calculations). The two systems interact and are always active. System 1 is constantly making suggestions to System 2 in the form of impressions, intuition, intentions and sensations. If they gain the approval of System 2, impressions and intuition become beliefs, and impulses become voluntary actions. Generally, the systems work together smoothly, so System 2 accepts the suggestions of System 1. Only when System 1 runs into difficulty does it turn to System 2 to suggest a more detailed and precise procedure that can solve the problem. This distribution of work between the two systems minimises effort and optimises execution. System 1 works adequately, its short-term predictions are usually appropriate, and its initial responses are quick and generally fitting. However, this system has biases – systematic errors that it is likely to commit in specific circumstances. System 2, however, is a slow process that consumes a lot of energy.

System 1	System 2
Fast	Slow
Instinctive	Analytical
Emotional	Structured
Automatic	Logical
Unconscious	Aware

This duality in the thought process has been studied and systematised for decades in the field of psychology (for example by Keith Stanovich and Richard West),¹ but it was already known or at least suspected even in ancient times.² In essence, the decision-making process is shaped by one way of thinking based on emotions and intuition that produces fast and automatic responses, and another more rational way of thinking that directs attention to the mental activities that demand it.

Therefore, intuition and reasoning should be considered the two ways of thinking. The first is responsible for quick impressions and judgements and the second is much slower, requires more effort and must be deliberately controlled.

Most daily decisions are made with System 1, with a reasonably good outcome, except for biases or errors that may occur. System 2 acts only to solve difficult questions that require analysis and critical capacity.

Kahneman's research shows that the rational agent model does not accurately depict humans, whose decisions are affected by "the quirks of System 1 and the laziness of System 2". Although intuition (or System 1) is very efficient in making complicated decisions, the outcomes are not always correct. This is due to the existence of biases, i.e., certain tricks or mental shortcuts (also called *heuristics*) that help simplify the multitude of mental processes that are constantly taking place, and make daily life easier.

3.2 Bias in investment decision-making

As mentioned in the previous section, people do not always make rational and careful choices. In fact, they reach most decisions following intuitive and automatic processes instead of analytical and controlled thought. As described in scientific literature, this fast and intuitive way of thinking is open to the influence of biases that lead to possibly erroneous decisions. The most common biases affecting investment decisions are the following:

- **Overconfidence.** The tendency to overestimate subjective knowledge and judgements and consider them to be accurate. When making decisions and forecasts, people overestimate their knowledge and personal experience without taking into account the difference between what they know and they think they know. Overconfidence can lead investors to think the probability of their investment failing is lower than it really is. The overconfident investor underestimates the risks of the investment and overestimates the expected gains.
- **Illusion of control.** The tendency to overestimate the possibility of influencing something over which objectively the investor has no control. This bias can lead investors to accept a higher-than-appropriate level of risk, trusting that

1 Stanovich, K. and West, R. (2000), *Individual Differences in Reasoning. Implications for the Rationality Debate?* Behavioral and Brain Sciences, No. 23, Cambridge: Cambridge University Press, pp. 645-665.

2 The dichotomy between reason and emotion has been analysed by numerous philosophers and thinkers. Examples include Plato's *The Republic*, Aristotle's *Rhetoric*, *Passions of the soul* by René Descartes or *Ethics, demonstrated in geometric order* by Baruch Spinoza.

through their analyses and available information, they can keep market fluctuations under control.

- **Confirmation bias.** Interpreting existing information or seeking new information in a way that supports previously-held beliefs or ideas. This bias causes investors to selectively seek information confirming their opinions instead of seeking contradicting opinions or reports, with the consequent risk of making an unsuitable investment.
- **Anchoring.** The predisposition to give more weight to the first information obtained than to newer, contradicting information. The name derives from the fact that these initial ideas sometimes turn into anchors that are difficult to release. Anchoring is a common bias in the investment world. For example, when the return on an investment product is presented first, investors may not take into account other less favourable information such as the associated risks. Another example is when investors take a former price as a reference for the share's performance.
- **Authority bias.** The tendency to overestimate the opinions of certain people, without judgement, just because of who they are. Investors may make decisions based solely on a recommendation from a family member or friend without any additional analysis and without taking into account their needs and risk profile.
- **Halo effect.** The predisposition to judge a person or institution based on a single positive or negative quality that overshadows all others. This bias is widespread among investors. There is a tendency to classify investment products as good or bad, using a single reference, such as a company's earnings or the popularity of the product's marketer or manager, without considering that this financial product may not be suitable for the investor's intended investment objective or risk profile.
- **Social proof.** The tendency to imitate the actions of others in the belief that theirs is the correct behaviour. This bias occurs in situations where the subject is not sure how to behave and is guided by the behaviour of others, assuming that they have more knowledge. In making investment decisions, the investor could be persuaded by the decisions of other people and choose unfavourable investments, simply because others do so.
- **Hyperbolic discounting.** The propensity to choose smaller and more immediate rewards rather than greater rewards that are more distant in time. This bias occurs because the immediacy of rewards has an enormous power of attraction. Hyperbolic discounting can lead an investor to sell an investment planned for the long term and suitable for their profile, due to expectations of a rise in the market or the appearance of more profitable financial products, therefore altering their initial objectives and resulting in associated costs and risks.
- **Loss aversion.** The tendency to weigh losses more than gains. In other words, the fear of losing something is a greater incentive than the possibility of gaining something of similar value. In order not to realise a loss, an investor might

hold onto a losing investment with minimal prospects for recovery and end up losing the entire investment.

Likewise, this bias may result in temporal myopia, which is especially harmful for long-term investors, leading them to continually evaluate the value of their portfolio and overreact to news and events that occur in the short term. Myopia causes the investor to lose perspective of their investments and the events that affect them .

- **Status quo bias.** The tendency to take the current situation as a reference point and perceive any change with respect to that point as a loss.
- **Optimism bias.** The tendency to overestimate the probability of positive outcomes and underestimate the possibilities of negative outcomes. In short, optimism weighs more than realism.
- **Sunk cost fallacy.** This bias makes an investor hold onto an investment that has fallen or is falling, for fear of losing their initial investment.

Although the biases listed above may affect various domains, they are especially relevant to financial markets for the following reasons:

- Most consumers think financial products are complicated. Making financial decisions can be difficult and time consuming. For this reason, consumers may lack the motivation to devote time and effort to making informed decisions about their financial products. Also, due to the inherent complexity of these products, the little interest they arouse in most people and investors' cognitive limitations, the concepts and traits associated with financial products can be challenging to understand.
- Most financial decisions require taking on a certain degree of risk and uncertainty.
- Many financial decisions are emotional. Financial decision-making can be influenced in many instances by emotions such as anxiety, fear of loss, excess optimism or a state of over excitement.

3.3 Behavioural economics and financial decision-making

Until the emergence of behavioural economics, traditional economic models contended that financial decision-making was a perfectly rational process based on the premise that people behave individually and completely rationally, have perfect information and seek to maximise their utility above any other consideration. With the contribution of behavioural economics, the economy moves away from its traditional, reductionist approach and begins to take into account sociological, anthropological and psychological aspects that influence the workings of the markets.

As described in the previous section, the findings of behavioural economics show that human beings are not as rational as was previously thought and are motivated by unconscious cognitive prejudices and external influences.

This new approach is very useful, not only for investors themselves but also for financial market regulators. Behavioural economics helps to gain a better sense of the financial decision-making process and the various factors involved. It also represents a new multidisciplinary approach to understanding the economy and getting to know financial consumers better. Logically, all of this has consequences for regulatory policy and, in particular, for investor protection.

4 Applicability of behavioural economics to investor protection

4.1 Previous issues

The legal system governing investor protection has several fundamental pillars: i) a set of rules of conduct and intervention in the contractual regime between investors and intermediaries, which affects both the pre-contractual phase – content and form of the contract – and the post-contractual information obligations; ii) the principle of information transparency, which applies to both issuers and intermediaries; iii) a prudential regulation regarding the internal organisation and solvency of investment services companies and other subjects bound by the obligation; iv) a system of authorisation and supervision by an independent regulatory body (CNMV) of the investment services companies, of the issuers and of the remaining subjects the regulation covers – including the exercise of regulatory sanctioning power; and (v) a procedural system, both arbitral and judicial, that allows investors to file claims or lawsuits in those cases in which they feel they have been harmed by any conduct of the issuers or intermediaries. In addition, this investor protection system is complemented by the Investment Guarantee Fund (FOGAIN).³

One of the basic premises on which the whole system is articulated is the ability of investors to make fully informed and rational decisions, based on the information provided, among other things. However, as observed, this premise does not fit exactly with the reality of human psychology: that people are only partially rational, act according to emotional impulses and are subject to certain cognitive limitations.

Consequently, the traditional analysis of the behaviour of individuals has its limitations. For this reason, the broader and more realistic vision of human behaviour provided by behavioural economics can facilitate the design of policies that are more effective for investor protection. In fact, experiments have shown that behavioural biases of agents exist and that these have not been clearly addressed by financial market regulations. For this reason, behavioural insights must be incorporated into regulatory processes to formulate more effective regulations.

3 Fernández de Aroz Gómez-Acebo, Alejandro. Rethink investor protection: basis for a new movable contracting regime. *La Ley Newspaper*, No. 8549, Doctrine Section, 28 May 2015, Ref. D-212, LA LEY Editorial.

4.2 Key aspects in the application of behavioural economics to investor protection

The application of the findings of behavioural economics to investor protection is necessarily subject to a process of observing a series of issues that can be divided into two stages:

- i) Stage 1: Identify and prioritise investor biases. Phases of investment decision-making.
- ii) Stage 2: Specify effective interventions to avoid these biases.

Stage 1: Identify and prioritise investor biases. Phases of investment decision-making.

Investment decision-making is a dynamic and complex process. It can be broken down into three phases or moments, not necessarily linear, in which the investor comes into contact with some aspect of the investment product or the entity that markets it, creating a first impression on both. In these three moments, an investor's emotions, thoughts and language play a vital role, as these are the key elements for decision-making of any kind. Also, in each phase, certain behavioural biases can influence investors, who need to be aware of them to lessen their consequences. These three moments are:

- i) **Search for information.** The first moment of contact with an investment product or the firm that markets it occurs when the investor actively seeks information about them. This moment might be an internet search, a visit to the firm, an advertisement, advice or conversation with someone; aspects such as comments on forums, social networks, client services or advertising, among others, can influence investors.

The most common biases in this phase are confirmation bias, anchoring, authority bias, hyperbolic discounting, overconfidence, the halo effect and social proof. The main risk during this phase is that these biases may influence the way investors process the information they receive on the product or firm, so they come to a decision without taking into account other data that could be relevant.

- ii) **Selection and purchase of the product.** In this phase, the investor deals with the product or firm. The investor continues to be conditioned by the biases mentioned in the previous stage, in addition to loss aversion and the illusion of control.

And because human behaviour is conditioned by loss aversion and hyperbolic discounting, the way information is presented is very important at this stage. Investors will make decisions based on how the options are framed. For example, they will not respond the same to the probability of making money as to losing it. Numerous studies show that when given a choice between a 100% probability of earning 500 euros and a 50% probability of earning 1000 euros, most subjects will choose the option of 500 euros. However, if the options are a

100% probability of losing 500 euros or a 50% probability of losing 1000 euros, subjects prefer to run the risk of losing an additional 500 euros. The expected outcome is the same in both scenarios, but the investor's inclination changes depending on whether profit or loss is at stake.

iii) **Investment tracking.** After purchasing the product, the next phase is monitoring its performance. In this phase, the main biases that condition investors are the hyperbolic discounting, status quo bias and the sunk cost fallacy.

For example, hyperbolic discounting can lead the investor to unwind an investment planned for the long term and suitable for their profile, due to expectations of a bull market or the appearance of more profitable financial products, therefore altering the initial objectives and resulting in associated costs and risks. Likewise, the investor may succumb the sunk cost fallacy and hold onto a failed investment with no possibility of recovery, to avoid the sensation of having lost the money, instead of closing the position to prevent further losses.

The following table shows a summary of the most common biases in each of these stages:

Investment moment	Bias
Search for information	Confirmation bias Anchoring Authority bias Hyperbolic discounting Overconfidence bias Halo effect Social proof
Selection and purchase of the product	Confirmation bias Authority bias Hyperbolic discounting Overconfidence bias Halo effect Social proof Loss aversion Illusion of control
Product tracking	Hyperbolic discounting Status quo bias Sunk cost fallacy

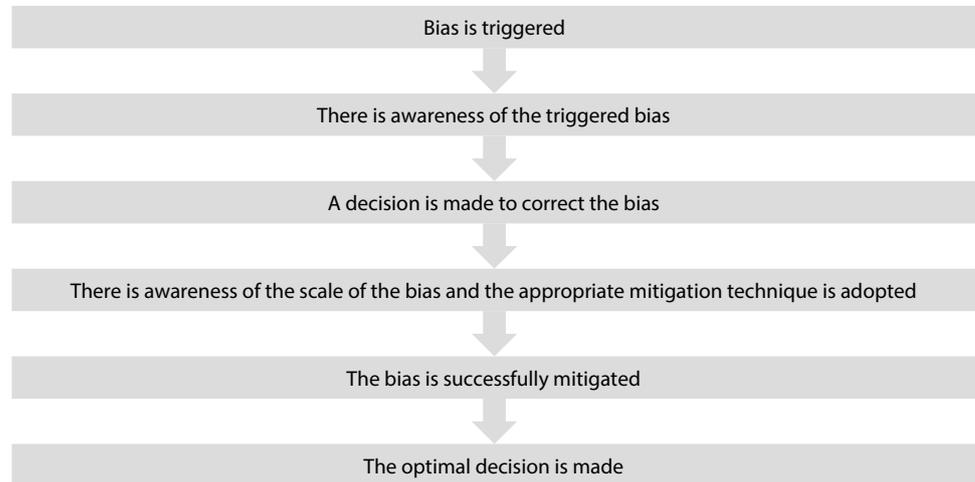
Stage 2: Specify effective interventions to avoid these biases.

The biases that influence investment decisions and the consequent risks associated with them cannot be eliminated, but they can be greatly mitigated (*debiasing*).

Bias mitigation encompasses a wide variety of techniques, procedures and interventions which can be implemented on a personal and institutional level, designed to eliminate or reduce errors, distortions or other misconceptions that are generated in the thinking process and decision-making.

The brain's configuration can produce systematic judgement errors. The leading causes of these errors lie in the interaction of the two previously mentioned thought systems which produce a narrow vision, framed within a specific context, and give rise to decisions based on incomplete and biased information. These errors cause a gap between the way we think and what would be the desirable way of thinking. Bias mitigation can go a long way to help reduce this gap.

The debiasing process is developed as follows:⁴



The next section describes the debiasing strategies that we can adopt to reduce the effects of cognitive bias.

4 See *Mental contamination and mental correction: unwanted influences on judgments and evaluations*. Wilson TD, Brekke N. *Psychol Bull.* 1994;116:117–42

5 Mitigation strategies for behavioural bias

Debiasing techniques are varied and, according to the intended objective, can be classified as follows:

- Techniques focused on improving decision-making skills through training.
- Techniques focused on shaping and framing the context in which a decision is made.
- Cognitive techniques designed to interpret differently the factors involved in decision-making.

According to the technique in question, these strategies can be developed by the investor, the firm or the regulator.

5.1 Techniques focused on improving decision-making skills through training

One way to avoid biases in decision-making is to provide the person concerned with the appropriate rules and guidelines. In this sense, education affects decision-making. People with extensive knowledge of economics are likely to apply this knowledge when making a financial decision, thus mitigating any biases.

However, in addition to having this knowledge, we need to know how to identify the situations in which it should be applied and have sufficient motivation to do so. For example, proper training to make a particular decision may not be enough in the face of very strong intuition that prevents deeper reflection.

The most effective type of training focuses on building specialised skills for making quick and repeated decisions. Both of these factors lead to experience and mastery in the adoption of specific decisions. The main challenge in this area is retaining the skills learned and applying them correctly when the situation so demands, something which requires a great deal of training.

A solid financial education, acquired from an early age and throughout one's life, is critical for financial decision-making. In this regard, as defined by the OECD, financial education should be understood as the process by which financial consumers/investors improve their understanding of financial products, concepts and risks, and through information, instruction and/or objective advice, develop skills and confidence to be more aware of financial risks and opportunities, make informed decisions, know where to go for help and take any effective action to improve their economic well-being.

Regarding financial education, knowledge of cognitive biases, which ones are most likely to occur and when, and ways to reduce them can be most beneficial to investors. Sometimes, the mere awareness that these biases exist can help lessen them.⁵ In other cases, mitigation requires deep self-knowledge that must go hand in hand with continuous observation and training. Some of the cognitive techniques used to perform this training are described below.

As a result, getting the appropriate training is an essential technique for mitigating biases. The training must include continual practice, the identification of situations in which this training must be applied and the reasons for doing so. For financial matters, such learning includes not only acquiring knowledge related to this domain and instruction in the skills necessary to make informed financial decisions. It should also include awareness of cognitive biases, the moments in which they are more likely to arise and ways to avoid them.

5.2 Techniques focused on shaping and framing the context in which a decision is made: the presentation of the information required to make a decision, the use of nudges and the creation of frames of reference

Another way to mitigate biases is to modify the environment in which people make decisions. The decision-making context can be altered to align better with a person's natural thought process when offered guidance, or to encourage the choice that is considered desirable. If the framing is changed, the choices made by the subject can change. This is especially relevant because framing can skew preferences or distort the perspective of the subjects, leading them to make misguided decisions.

In general, there are two very different ways of modifying the environment. We can change something in the context to encourage people to process information more appropriately or adapt it to the typical biases that most people have – so that they use these biases to their benefit.

The main techniques for altering decision-making contexts are presented below. Some of these are framed within one of the two approaches mentioned above and others combine the two approaches:

Presentation of the information required to make a decision

The way information is presented can affect how the subject processes it. The same information presented in two different manners to the same person can produce

5 This is the case of the transparency illusion bias according to which people often believe that their internal state is more evident to others than it really is. In the area of public speaking, for example, people who get nervous when giving a speech believe that their nervousness is more evident to their audience than it really is. However, it has been demonstrated that being aware of this bias can improve the quality of the speaker's performance, both from the speaker's perspective and from the viewpoint of the observers. See *The illusion of transparency and the alleviation of speech anxiety*. Kenneth Savitsky and Thomas Gilovich. *Journal of Experimental Social Psychology*. Volume 39, November 2003, pp. 618-625.

very different results. Consequently, the way information is presented influences the mitigation or intensification of certain cognitive biases.

For this reason, a technique that can help mitigate biases is to provide the correct information for making a decision within a reliable, intuitive and understandable framework that makes it easier to comprehend.

Particularly, in the area of financial decision-making, when marketing their products, firms should provide information in compliance with the following precepts:⁶

- Emphasise relevant information by using design features such as tables, different font sizes, etc.
- Consider whether any information should be accompanied by hyperlinks (for example, using design features such as pop-up descriptions) or other means intended to provide additional details for customers requesting more information (e.g., using an FAQ section).
- Design the questionnaires for collecting information about customers paying particular attention to clarity, completeness and intelligibility and avoiding the use of deceptive, confusing, inaccurate and excessively technical language.
- Prepare the information carefully and avoid directing the decisions of investors toward a specific outcome.
- Adopt mechanisms to deal with the risk that customers tend to overestimate their knowledge and experience, e.g., including questions that help them assess the general understanding of the characteristics and risks of different types of financial instruments.
- Prioritise simple explanations over complex texts, given the tendency of customers to reject arguments they consider to be complicated in favour of those that are easier to process.

These measures may be particularly important when decision-making is assisted by automated procedures. The risk of investors overestimating their knowledge may be greater when information is provided through an automated (or semi-automated) system, especially when human interaction between customers and company employees is expected to be very limited or non-existent.

In conclusion, the way information is presented has a crucial impact on how it is processed. Presenting information optimally, so that it encourages reflection and not intuitive reaction, can significantly contribute to the mitigation of cognitive biases.

6 See guidelines on certain aspects of MIFID II eligibility requirements. https://www.esma.europa.eu/sites/default/files/library/esma35-43-163_guidelines_on_certain_aspects_of_mifid_ii_suitability_requirements_en.pdf

Use of nudges

One of the best-known techniques for modifying the environment is the use of nudges, i.e., strategies that *push* people to make beneficial long-term decisions. A nudge is any aspect of the choice architecture that alters people's behavior in a predictable way without forbidding any options or significantly changing their economic incentives. To count as a mere nudge, the intervention must be easy and cheap to avoid. Nudges are not mandates.⁷

Consequently, nudges are simple modifications to the environment that lead to changes in people's decision-making process. They require a deliberate design of the choice architecture as a tool to improve decisions and minimise errors derived from cognitive biases.

Some of the most commonly used and effective nudges are:

Nudges based on the default options

Individuals have a strong tendency towards inertia or the status quo bias. This trend can be exploited in the design of default options, so that these options are the most beneficial for the subject. Default options can help people who repeatedly procrastinate or are careless.

An example used in some countries, such as England, is the automatic enrolment of employees to a retirement savings plan, to which the employee contributes a percentage of their salary. The aim is to reduce the impact of procrastination and hyperbolic discounting, and take advantage of the subject's inertia. The employee is periodically offered the possibility of opting out of this savings scheme but is enrolled by default.

Nudges based on the strength of social norms

Social norms are a determining behavioural factor due in part to the concurrence of the herd mentality and the need for social proof. Therefore, these biases can be used to encourage individuals to act in a certain way. The aim is to highlight what constitutes normal behaviour among most people in the subject's immediate environment, with the expectation that this message will encourage people to behave in the same way to comply with social norms.

An example of this type of nudge would be to inform citizens that the majority of people pay their taxes on time.

Nudges based on the visibility of incentives or the risk of loss

Occasionally, cognitive biases may arise due to insufficient motivation for desirable behaviour. One way to change this environment is to encourage people to make smarter decisions.

⁷ See *Nudge: improving decisions about health, wealth and happiness*. CASS R. SUNSTEIN; RICHARD H. THALER, 2017

To this end, choice architects use nudges that factor in the right incentives and focus on making them visible.

One frequently used nudge is to highlight the risk of suffering losses and the consequent financial setback people could face if they do not change their behaviour. For example, subjects may be informed of the approximate loss they would incur if they do not change their habits, or conversely, of the amount of money they could make if they do. Examples of this are the numerous personal finance management applications (Fintonic, Money Wise, etc.) that encourage users to modify their financial habits by presenting information framed around the advantages or disadvantages of doing so.

Nudges based on the understanding of correlations: between choice and well-being

Another frequently used type of nudging helps people improve their ability to establish a correlation between choice and well-being, and therefore select the options that are most beneficial to them. One way to help improve this ability is to make the information available on the different alternatives easier to understand.

An example in finance is credit cards. Understanding the cost of using these cards can sometimes prove challenging, due to the different applicable fees and interest and the way this information is presented to consumers. Therefore, it is difficult for the consumer to establish the right correlation between choice and well-being. Using the RECAP system (register, evaluate and compare alternative prices) could mitigate this difficulty, whereby the different service providers inform customers of the applicable rates or fees in a clear and transparent manner, allowing them to easily compare the prices of these services.

Nudges based on the structure of complex decisions

People adopt different decision-making strategies, depending on the variety and complexity of the options available. When there are few alternatives, people tend to examine and weigh up each one before making a final decision.

However, when there are numerous options, they tend to use strategies that simplify the decision, which can cause problems. So, as the alternatives become more diverse and complex, the choice architecture has to take into account more factors and is likely to have a greater influence on the consumer's final decision. An example would be the multitude of applications⁸ available to simplify financial decision-making. These apps structure the decision process through the progressive inclusion of options that are closer to the user's preferences and the exclusion of those that are less aligned.

Creation of frameworks

Another way to mitigate cognitive biases is to incorporate the findings of behavioural economics into regulatory policies. For this purpose, regulators rely on the

8 See the application developed by the Australian Securities & Investment Commission: <https://www.moneysmart.gov.au/investing/financial-advice/financial-advice-toolkit>

creation of frameworks as a practical way of developing policies that promote effective behavioural change without a detailed understanding of behavioural economics.

Researchers in the field of behavioural economics have developed a considerable number of frameworks that can be applied in areas as diverse as public health, the environment or marketing. IOSCO and the OECD⁹ have also advanced in this area and have established specific frameworks for improving the financial literacy and competencies of investors and, in general, their protection. The premise underlying these frameworks is that investor competence can potentially be enhanced not only through education but also by directly influencing attitudes and behaviours. In this sense, IOSCO has recognised that changing the attitudes and behaviour of retail investors is more effective than providing information to improve their knowledge. This organisation is currently working hard to identify approaches that will help to improve people's financial capability.

The selection of an appropriate framework for the design of effective behaviour changing techniques must factor in a broad set of contextual considerations and should be linked to a coherent behavioural system capable of conceptualising causal associations between its components. The purpose of these frameworks is to configure a simple and practical instrument to help public policy makers to reflect on behavioural changes and put them into practice.

There are many diverse frameworks of this type,¹⁰ although most of them have aspects in common. When designing effective policy interventions aimed at reducing the effects of biases on human behaviour, these common aspects should be taken into account. Using these models as a reference, the following key points should be included:

- The design of more effective interventions should be based on a better understanding of why people act as they do. The limits and systematic prejudices that affect human attention, decision-making and self-regulating capacities must be taken into account.
- The design entails breaking down the issue to be addressed with regulation into clearly identifiable behaviours.
- Likewise, the desirable behaviours for people to adopt when confronted with an issue like the one to be addressed with regulation should be specified.
- These behaviours should be simple, attractive, timely and stand out for their social character.
- The influence of default options must be taken into account. Subjects have a strong tendency to choose the default option, which is the simplest because it does not require any effort or analysis. Making an alternative the default option increases the probability of people selecting it.

9 See the joint document prepared by the IOSCO and OECD: *The Application of Behavioural Insights to Financial Literacy and Investor Education Programs Initiatives* (2018).

10 For example, Com-B, The behavior change wheel, Mindspace, East, Test, Design for behavior change (create) or the most recent model, Basic, developed by the OECD.

- It is also advisable to minimise the trouble or inconvenience of a particular choice. The effort required for selecting specific alternatives often discourages people. Therefore, making it easier to do something can increase the likelihood of that option being chosen or improve the response rate of citizens.
- Simplifying messages to ensure their clarity often results in a significant increase in the recipient response rate.
- It is recommended to take advantage of *prominence*, i.e., people’s tendency to respond better to stimuli that are new, simple and accessible.

5.3 Cognitive techniques designed to interpret differently the factors involved in making a decision: create alternatives, curb optimism or take the opposite view, and standardise the investment process and identify the appropriate conditions for the decision-making process

Cognitive techniques are the activities and mental processes that people perform consciously to understand the world around them, learn from their experience, solve problems or adopt solutions. In short, these are internally organised actions that the individual uses to process information, remember it, transform it, retain it and transfer it to new situations.¹¹

Although these techniques require some effort, they create a greater awareness of the person’s own thinking process, emphasising their role as protagonists in this process, encouraging them to rely on conscious reasoning rather than subconscious intuition, and helping them to identify errors in the logic used.

Some of the techniques that may be most useful in making investment decisions are described below.

Create alternatives

Although the benefits of analysing problems from multiple perspectives are well established, we seldom use this technique when making decisions.

Much of the research on decision-making has focused on whether people make optimal decisions when faced with a fixed set of options, but having a good set of alternatives from which to choose is just as important as choosing correctly.

For financial decisions, investors need to look for alternatives to the intended investment and weigh up the pros and cons of the different options.

11 Derry, S. and Murphy, D. (1986) Designing systems that train learning ability: From theory to practice. Review of Educational Research.

Curb optimism or take the opposite view. *Premortem* analysis

The predisposition to optimism is a common tendency in people. This optimism comes from the way we think positively of ourselves, of the consequences of our decisions or of the future that lies ahead. It is another cognitive bias that causes people to underestimate the possibility of a negative event.

The tendency towards optimism plays a very important role in financial decisions. An excess of optimism can alter the capacity for critical thinking when choosing an investment product, causing one to ignore unfavourable information about that product or the possibility of losing the investment.

One solution to the recurrence of this bias is simply to “take the opposite view” by articulating a series of reasons why an initial decision could be wrong or fail.

A further step is prospective hindsight or *premortem* analysis, whereby the person is mentally situated in the future and thinks that their decision has failed. Faced with past failure, even if only imaginary, people tend to identify the possible causes more easily than if they try to do this from the present moment. This is because human beings find it easier to explain what has happened once it has already happened than to make a forecast of what may happen.

Likewise, the *premortem* analysis technique can be useful in reducing another cognitive bias, called hindsight bias. Hindsight bias is the tendency, once we know what has happened, to change our memory of what we believed before the event occurred so that it matches the outcome.¹² This false memory makes us think we could have predicted the outcome before it happened.

Standardise the decision process. Investment process and checklists

One way to make decisions is with a standardised method by setting up a suitable procedure. By incorporating the most convenient bias mitigation techniques into this procedure, an optimal decision-making process can be developed.

Regarding financial decisions and based on the phases of the decision-making process mentioned earlier and the biases that most frequently influence investors, it is possible to design an individualised investment process that leads to unbiased decisions.

A simple way to design this process is to apply, with certain modifications, the classic five Ws¹³ of journalism: what you want to invest in, why you want to invest, how you want to invest, how much you want to invest, when you want to invest and for how long. This simple exercise necessarily encourages reflection before making a decision and therefore helps to reduce the influence of biases.

12 Bandrés Moya, Fernando; Delgado Bueno, Santiago (2010). *Biomedicina y derecho sanitario*.

13 The 5Ws of journalism are Who, What, When, Where and Why.

Another way to standardise the decision-making process, also applicable to finance, is to use checklists. This technique includes the minimum steps necessary to perform a specific task, defines the steps and avoids errors. Checklists not only offer the possibility of verification but also instil a certain discipline to achieve the best performance while reducing errors. Although this technique originated in the field of aviation, given its simplicity and effectiveness, it has spread to other areas such as medicine and construction.

A checklist helps us to be as rational as possible during each phase of the process and guarantees that the necessary information is available at the right time and that our decisions are methodical.

For investing, a checklist can be a list of points needing verification in the form of questions relating to the investment product under study. The answers will help clarify whether or not said product should be purchased. These lists are very personal and should take into account mistakes made in the past. They should be very brief. Likewise, they should not be static but open to improvements from experience and practice. The following is an example of a simple checklist:

- Have I read all the product information carefully?
- Is the information complete?
- Do I understand the basic characteristics of the product?
- Do I know what I am investing in?
- Do I know the risks?
- Does the product fit my investor profile?
- Is the time horizon of the investment consistent with my investment profile?

In short, given the complexity of certain decisions, the systematisation of the process is a good option. The advantage is that it is possible to mitigate the errors that systematically occur in the process and which, therefore, are predictable. Like the rest of cognitive techniques, perfecting the systematisation of the decision-making process requires training and time.

Identify the appropriate conditions for the decision-making process

To avoid biased decisions, it is important to improve the personal conditions in which they are made, so that the individual is prepared to make a choice.

As mentioned earlier, System 2 plays a critical role in decision-making: it monitors intuitive judgement and, when necessary, corrects it. An individual will be prepared to make decisions when their system 2 can perform these functions.

The factors that determine whether or not a person is prepared to make a decision range from their chronotype¹⁴ to how tired or distracted, angry, hungry or sleepy they are. These conditions, among others, temporarily limit a person's ability to

14 Internal circadian rhythm of an individual that influences their sleep pattern and activity in a 24-hour period.

monitor decisions and notice possible errors, which means that attention is directed to a search for quick solutions and greater confidence is placed in intuition. It is essential to be aware that these are factors that limit cognitive ability and, therefore, important decisions should be avoided when under their influence.

This section contains a summary table showing the debiasing strategies described in this section:

Type of debiasing strategy	Debiasing strategy	Executor
Techniques focused on improving decision-making skills through training.	Education.	Investor
		Entity
		Regulator
Techniques focused on shaping and framing the context in which a decision is made.	Presentation of the information required to make a decision.	Entity
	Use of nudges.	Regulator
	Creation of frameworks.	Regulator
Cognitive techniques designed to interpret differently the factors involved in decision-making.	Create alternatives.	Investor
	Curb optimism or take the opposite view. <i>Premortem</i> analysis.	Investor
	Standardise the decision-making process. Investment process and checklists.	Investor
	Identify the appropriate conditions for the decision-making process.	Investor

6 Final recommendations

Final recommendations for the investor

- A solid financial education acquired from a very early age and throughout life is essential. In this specific context, in addition to having the appropriate financial literacy, investors will benefit from knowing what behavioural biases are, when they occur and the techniques to avoid them
- Before making a decision, investors should think about alternative options and weigh up the pros and cons of each one.
- Human beings have a strong tendency towards optimism, so before making decisions, investors should think about the possibility that the investment may not achieve the desired result
- Systematising the investment process is advisable. One way is to use checklists.
- Investment decisions should be made under optimal conditions. Investors should be aware of the factors that can limit their ability to monitor these decisions, such as physical or mental fatigue.

Final recommendations for entities

- It is necessary to design the questionnaires for collecting information about customers paying special attention to their clarity, completeness and intelligibility and avoiding the use of deceptive, confusing, inaccurate or excessively technical language.
- The information should be prepared carefully and avoid directing the decisions of investors toward a specific outcome.
- It is advisable to adopt mechanisms to address the risk of customers overestimating their knowledge and experience, e.g., including questions that help them assess their general understanding of the characteristics and risks of different types of financial instruments.
- It is critical to prioritise simple explanations over complicated texts, given the tendency of customers to reject arguments they consider complicated in favour of those that are easier to process.

Final recommendations for regulators

- Regulators should continue their efforts to promote adequate financial literacy among citizens, which should include not only education in personal finance but also how financial decisions are made and how behavioural biases influence them.
- Nudging may be used as a public policy tool that supplements those already in use and is especially useful to address specific social, environmental and economic challenges.
- Nudging is particularly effective due to the individual behaviour changes it promotes. The flexibility and simplicity of this tool allow its use in different contexts.

7 Conclusions

In the previous sections, it has been pointed out that although the hypothesis of market efficiency and the consequent perfect rationality of individuals has been dominant for years, the emergence of new economic disciplines has raised reasonable doubts about the veracity of this theory. Research on the human brain carried out mainly in the areas of neurology, psychology and anthropology has shown that people's behaviour and the way they make decisions are the result of multiple components that act together. It is necessary to understand these components in depth to obtain a full picture of the decision-making process.

The human brain is the result of millions of years of evolution and natural selection during which it has been adapting to its environment and modelling different behaviours. In this process of evolution, human beings have acquired language, abstract thinking and predictive capacity based on memory, among other traits, that have played a fundamental role in our successful adaptation to the environment. Heuristics, cognitive shortcuts and behavioural biases are the result of this evolutionary process, i.e., a series of adaptations in brain functions over time and under various circumstances, which have given rise to behaviours that improve the possibility of survival.

Behavioural economics has therefore emerged as a response to the challenges posed by various psychologists and economists, to address the shortcomings of the neo-classical economic model, specifically in regard to establishing a real decision-making model. Humans do not have unlimited rationality, nor do we always act in our best interests. In contrast, fear or happiness, context or the behaviour of others, among many other factors, have a much stronger influence on these decisions than was previously thought.

Behavioural economics has brought to light the cognitive biases that typically influence people's decisions and has led to the development of behavioural strategies or models to avoid these decision errors.

The application of the findings of behavioural economics to investor protection must be subject to an observation process in which it is necessary to identify and prioritise the biases that influence investors and specify effective interventions to avoid them. These biases cannot be eliminated, but they can be notably mitigated.

Bias mitigation encompasses a wide variety of techniques, procedures and interventions, designed to eliminate or reduce errors, distortions or other misconceptions generated in the thought process and decision-making. These debiasing techniques are varied and can be implemented by the investor, the entity or the regulator. However, we should keep in mind that the effectiveness of the different debiasing strategies can vary and that their impact differs depending on the scenario.

Behavioural economics faces two key challenges. First, to continue its development, which is still incipient and will necessarily go hand in hand with advances in the sciences that it builds on – particularly those from the fields of neuroscience and psychology. Economics has the opportunity to take advantage of the discoveries from these disciplines and the objective research on brain function when making decisions, and thus gain insight into human behaviour.

The second and perhaps most important challenge is the need for an even broader practical application and consequent incorporation of behavioural economics into regulatory policies, as well as for a better understanding of the discipline on the part of entities and investors. The knowledge of human behaviour acquired to date, and notably that contributed by behavioural economics, can aid the development of regulatory policies that are more focused on the subjects they address and, therefore, potentially highly effectual.

Lastly, the increasing salience of behavioural disciplines, in particular behavioural economics, is already a clear trend since a deep understanding of human behaviour contributes to the design and development of more focused and effective regulatory policies.

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