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STUDY ON BEHAVIOURAL ECONOMICS FOR EFFICIENT REGULATION AND SUPERVISION

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SUMMARY

Behavioural economics has great potential to enhance the effectiveness and efficiency of regulations, public policies, and supervision, thereby benefiting the proper functioning of markets, consumers, and the economy. These instruments are flexible, respect freedom of choice, and are very low-cost. Therefore, many countries use these instruments systematically. To promote their use in Spain, the CNMC recommends creating a regulatory framework on the subject, including behavioural units, networks of experts, human capital, and integration into international forums. Second, adopting behavioural economics in the design and evaluation of regulations and public policies, promoting guidance documents, transparency, experimentation, and a sandbox. Third, introducing a behavioural approach into the work of supervisors, also promoting prevention and awareness-raising measures, and fostering collaboration between institutions.

KEY WORDS: regulation; supervision; competition; behavioural economics; cognitive biases; heuristics; nudges.

JEL CODES: C9; D9; K23; L4; L51.

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EXECUTIVE SUMMARY

Achieving more efficient and effective public policies and regulations is a fundamental pillar for the progress of our economy and society. This goal, shared by both institutional decision-makers and citizens, becomes even more urgent in contexts with limited resources and growing economic and social complexity. It is therefore unsurprising that behavioural economics has gained importance in the last decade, a discipline with considerable potential to contribute to the aim of enhancing public policies at very low cost while respecting individual freedom.

Through behavioural tools, public decision-makers worldwide aim to create better-designed, more effective, and more efficient rules and policies. This aims to promote better-functioning markets and institutions, benefiting consumers and citizens, especially those most reliant on public regulations and policies, who are often the most vulnerable and have the fewest resources.

This study begins by examining the usefulness of behavioural economics tools and their level of international adoption. **These instruments are widely incorporated into the design of regulations and public policies in advanced economies**, typically within specific institutional frameworks that include behavioural economics units (or *nudge units*). These units consider the limitations of rationality and systematic biases of individuals when making decisions. To enhance public actions, they recommend behavioural interventions such as default options, reminders, process simplification, framing techniques, comparisons, and social norms.

Behavioural tools are also relevant in supervisory work. This study documents that economic operators, including private companies, are also familiar with and use behavioural tools. Their use may be reasonable in many contexts. However, misused tools can lead consumers to make choices that are detrimental to their own interests. Therefore, numerous supervisory authorities worldwide are incorporating behavioural considerations into their work, to prevent and combat the use of these tools to protect against unlawful conduct.

This analysis has identified areas where public administrations and regulations have room for improvement. In particular, Spain lacks a specific institutional framework for behavioural economics, which may explain the limited and fragmented use of behavioural tools in the country. Second, behavioural considerations are rarely included in the deliberation, decision-making, and implementation of regulations or public policies. This could lead to the underutilization of the potential of these tools, resulting in a decrease in the effectiveness and efficiency of regulations and public interventions. Third, it is essential to incorporate a behavioural approach in supervision to prevent and address any use that may breach regulations.

Thus, **incorporating behavioural economics into the regulation, design, implementation, and evaluation of public policies, as well as in supervisory areas, offers great potential to boost effectiveness and efficiency**, benefiting the proper functioning of markets, consumers, and the economy. All this, moreover, while respecting citizens' freedom of choice and incurring very low intervention costs.

To this end, **the CNMC makes the following recommendations:**

FIRST. CREATE AN INSTITUTIONAL FRAMEWORK FOR BEHAVIOURAL ECONOMICS

I. Establish behavioural economics units

It is recommended to create an institutional framework that would encourage the systematic integration of behavioural insights. Following international examples, this framework could be based on behavioural economics units (*nudge units)*.

II. Establish a network of behavioural experts within public administrations

It is recommended to create a network of experts in this area to help disseminate knowledge and best practices.

III. Enhancing the human capital of public administrations in behavioural economics

It is recommended to strengthen the human capital of public administrations through training, recruitment, and collaboration with experts.

IV. Participation in international forums on behavioural economics and the adoption of best practices

It is proposed to incorporate Spain into international forums on the subject.

SECOND. INCORPORATE BEHAVIOURAL ECONOMICS IN REGULATION AND PUBLIC POLICIES

V. Integrating behavioural economics into regulatory and public policy design processes

It is recommended that behavioural science be rigorously and systematically incorporated into the policy and regulatory design process in order to harness its potential and adopt the most effective and proportionate measures in each case.

VI. Including behavioural assessment in regulations, procedures, and guides for public policy evaluation

The proposal is to systematically introduce behavioural economics into the evaluation of regulation and public policies, through its inclusion in procedures, regulations, and all phases of these assessments.

VII. Developing guidance and support tools for public administrations, such as guidelines, manuals and self-assessment tools

It is recommended that guidelines, manuals, self-assessment tools, and other guidance and support materials be developed to promote the adoption of behavioural economics in public administration work.

VIII. *Encouraging experimentation and developing test environments (regulatory sandboxes)*

It is recommended to encourage experimentation to strengthen the design and evaluation of behavioural interventions. This could be achieved by creating a behavioural sandbox.

IX. Preventing and eliminating sludge

It is proposed to introduce structured methods to prevent behavioural barriers and to implement audits to identify and eliminate existing ones.

X. Keep promoting transparency and data availability to support the assessment of public policies

It is proposed to continue promoting a proactive transparency policy and enhancing accessible and open behavioural data, in order to foster research and investigation.

THIRD. INCLUDE BEHAVIOURAL ECONOMICS INTO MARKET SUPERVISION

XI. Incorporating the behavioural approach into the work of supervisory authorities

It is recommended that behavioural considerations be systematically incorporated into market supervision activities.

XII. Reinforcing prevention and awareness of regulatory compliance in behavioural economics

It is recommended to promote prevention and awareness-raising in the field of behavioural economics to improve compliance with regulations.

XIII. Enhancing collaboration and coordination on behavioural issues between supervisory and regulatory authorities

It is recommended to strengthen collaboration and coordination on behavioural issues among supervisory and regulatory bodies in order to achieve a coherent and robust approach that provides certainty.

1. INTRODUCTION

Improving the efficiency of regulations and public policies is a constant aspiration of institutional decision-makers and society, especially in contexts of increasing economic and social complexity and limited resources. Finding formulas that effectively achieve this goal presents a complex challenge, as it requires a thorough understanding of both the regulatory environment and citizen behaviour.

In recent years, significant progress has been made in this area, which has proven useful and beneficial to society. These advances have led to improvements in terms of more precise and tailored policies, boosting their effectiveness and efficiency for the benefit of citizens. These benefits can be especially valuable for those groups most affected by and dependent on public action, such as vulnerable people or those with limited resources.

Many foundations have their origins in the 1980s, when the so-called "behavioural economics" began to develop. Its objective is to analyse the functioning of the economy based on a realistic description of individual behaviour[1]. This discipline seeks to overcome the limitations of traditional economic thought, based on the premise that individuals are perfectly rational agents who act in their own interest (*homo œconomicus*) and possess unlimited cognitive capacities to choose, from among all possible alternatives, those that maximise their well-being. To this end, behavioural economics adopts contributions from psychology, neuroscience, and sociology.

These premises have been gaining weight in the theoretical and academic debate, and, in the last two decades, this new area of knowledge has also begun to be embedded more systematically in the development of public policies, often through the creation of behavioural analysis units (*nudge units*). By their very nature, in most cases, nudges have zero or very low implementation costs: they simply require a slight change in the way things are done. This makes them very flexible and relatively easy to implement. Another defining characteristic of nudges is that they do not significantly alter economic incentives. Consequently, by definition, they do not restrict individuals' freedom of action or generate significant costs if they deviate from the behaviour desired by the "choice architect".

Public policies have greater potential for effectiveness if they are designed with this behavioural knowledge in mind and aligned with a thorough understanding of the decision-making process of the target audience. For this reason, in recent years, a large number of public administrations have shown interest in using these

[1] Economic theory is often based on simplifying assumptions about reality that facilitate analysis. One of the conclusions of behavioural economics is that these simplifying assumptions are not a reasonable approximation of the actual behaviour of agents in some situations and can lead to erroneous conclusions.

behavioural instruments as a potential complement or alternative to other more restrictive or costly regulatory instruments, such as obligations and prohibitions, or subsidies and taxes, and also as a complement to the design and implementation of traditional regulatory tools.

In addition to the design of regulations and policies, another area where their application may be relevant is market supervision—whether in financial, healthcare, digital or antitrust matters—and consumer protection. This is because cognitive biases can influence the decisions made by economic operators in markets, and, like public administrations, other agents, including private companies, can employ behavioural tools to achieve their objectives. This may be reasonable in many cases, but if misused, these tools can induce consumers to opt for alternatives that are contrary to their interests or even lead to behaviours that violate regulations.

Given all that has been mentioned, and considering its potential, a study that thoroughly analyses the implications of behavioural economics and its ability to contribute to more efficient and effective regulation, supervision, and public policies becomes increasingly important. Thus, the objective of this study is to identify areas for improvement and present recommendations that promote the use of these tools by Spanish public administrations. This will improve the efficiency of regulations and public policies, strengthen compliance with the principles of efficient regulation, and facilitate better functioning markets, benefiting consumers and the general public.

The study is structured as follows. The second section presents general considerations, characteristics, and criticisms of behavioural tools. The third section presents the uses of behavioural tools to strengthen regulation and public policies. The fourth section reviews the potential of behavioural economics for supervisory purposes. Finally, the fifth section presents the main conclusions and recommendations arising from the analysis conducted throughout the study.

2. GENERAL CONSIDERATIONS

2.1. Development of the discipline

2.1.1. Origins of behavioural economics

Behavioural economics can be defined as the branch of economics that aims to analyse the social and cognitive aspects of decision-making[2]. While economists have always studied human behaviour, it was not until the second half of the 20th century, following the growing contributions of social and cognitive psychology, sociology, and neuroscience[3], that they began to integrate these ideas more systematically, often questioning some of the assumptions of traditional economic analysis.

It is often argued (Ashraf, Camerer, & Loewenstein, 2005) that the importance of psychological and sociological factors in economics was recognised by early economic thinkers in the 18th century, such as David Hume (1777) and Adam Smith (1759), who discussed concepts such as loss aversion, willpower, and the psychological principles of individual behaviour. Jeremy Bentham (1781) wrote extensively on the foundations of utility. Later economists recognised that human behaviour often does not follow the path that rational analysis would predict.

In the 19th century there was a certain distancing between economics and psychology (Cortiñas, 2022) with the adoption in economics of the a priori method of John Stuart Mill (1843), who established the basic axioms for economic laws. This separation was enhanced by the development of neoclassical economics and its successive contributions, such as the theory of marginal utility, the indifference curve and the theory of revealed preference, as well as the theory of rational choice. As the discipline was sought to be redefined as a science, simplifying assumptions were adopted regarding the nature of economic agents to model their economic behaviour and thus facilitate analysis, and in this way the basic assumption of *homo œconomicus*, whose psychology was fundamentally rational, was accepted.

The term behavioural economics was first used in the 1950s and appears to have its roots in the early work of psychologists such as B.F. Skinner (1953), who

[2] Section 2. *General Considerations* is based broadly on the findings of the Committee on Future Directions for Applying Behavioural Economics to Policy *of* the *National Academies of Sciences, Engineering and Medicine* (NASEM) in the USA (2023). They have been supplemented by descriptions and classifications of biases and methodologies by NASEM and Costas-Perez and Tucat (2021).

[3] The last forty years have seen the rise of neuroscience, which, thanks to new techniques such as functional magnetic resonance imaging (fMRI), allows the observation and measurement of various brain processes. It has questioned the existence of a centralized brain process (reason) that produces what is called a decision, being observed that what happens in the brain is a complex process of competition between various neuronal processes, intending to produce a decision.

raised the possibility of a science of human behaviour after studying the role of conditioning and reinforcement in behaviour. However, arguably the main precursor to behavioural economics was the work of Herbert Simon, who led the critique of the standard rational choice model in the 1950s and 1960s by introducing the concept of *bounded rationality* (1957).

Concepts associated with behavioural economics have since emerged from a variety of disciplines. But, without a doubt, research in psychology has traditionally been the main source of ideas, with special mention to cognitive psychologists, such as Daniel Kahneman and Amos Tversky (1972, 1973, 1974), who extensively documented the heuristics and biases in people's perceptions and how these influence their decisions. Equally influential was their "Prospect Theory" (Kahneman and Tversky, 1979), which proposes an explanation of individual decision-making that deviates from traditional assumptions. Under this behavioural model, agents make comparative valuations based on a reference point, are averse to losses[4], and confuse probabilities associated with uncertain events.

2.1.2. Development of behavioural economics

Prospect Theory laid the groundwork for collaboration between psychologists and economists. Economist Richard H. Thaler, who eventually co-authored the concept of nudge, worked with Kahneman, Tversky, and other psychologists at the time to incorporate insights from cognitive and social psychology into economics. In 1981 he already analysed temporal inconsistencies in consumption decisions (Thaler and Shefrin, 1981)[5]. Thaler also studied the possible biases in the perception of individuals regarding price and wage setting, or the implications of Prospect Theory on agents' buying and selling decisions (Kahneman, Knetsch, & Thaler, 1986), suggesting the existence of an endowment effect, according to which people attribute more value to things simply by owning them, making them reluctant to lose them. That is, we value things more when we perceive them as "ours".

In parallel, multiple investigations and theories emerged to explain how people make decisions under conditions of uncertainty and how biases, or the way in which the available options are framed (*framing*), affect individual decisions, which served to incorporate some of these concepts and findings from

[4] This is a bias that leads to a disproportionate assessment of the risk of loss over the opportunity of gain in uncertain situations. People weigh negative or harmful aspects more heavily and will make decisions to avoid them.

[5] Which led them to publish in 1998 "*the behavioural life-cycle hypothesis"*, which incorporates framing biases and self-control to develop a theory in which households treat the different components of their wealth as non-fungible.

psychology into formal theoretical models of decision-making, and to contrast them, using observational and experimental methods. Other research stream focused on field data and extended the work on behavioural biases to two main areas: the study of financial markets (Thaler, 1993, 2005; Shleifer, 2000; Shiller, 2005) and the research on consumption and savings (Laibson, 2001).

Another significant source emerged from the work of experimental economists (NASEM, 2023). Various studies (Camerer and Thaler, 1995; Dawes and Thaler, 1988; Thaler, 1988) addressed different issues, such as non-market decision-making and the development of institutions to solve collective action problems (Grether and Plott, 1979). They also highlighted the importance of observing patterns in subjects' behaviour in laboratory settings to modify theoretical models (Selten, 1998), how problems related to the provision of public goods and common goods are influenced by cultural context and the development of local institutions (Ostrom, 1990), or in demonstrating that the key to understanding human behaviour is understanding the institutional environment.

These contributions found that "rational" behaviours arise in suitable contexts. For example, when individuals face market discipline and other competitive situations, cooperation is encouraged when it increases the size of the available resource pie (Smith V. L., 1989). The contribution of these scholars, therefore, lies in their focus on experimentally analysing how individual behaviour adapts in institutional settings to produce specific outcomes.

Experimental economists, in their attempts to test game theory in laboratory experiments, often encountered the complexity of human motivation. Unexpected findings repeatedly emerged where subjects' responses systematically diverged from the theory's predictions (Güth, Schmittberger, & Schwarze, 1982; Isaac, McCue, & Plott, 1985). Individuals systematically considered not only their own benefit but also the benefit of others[6]. Contrary to what would be rationally expected, people were generous, trusting, trustworthy, and considered their income in relation to others. Thus, a growing body of evidence has accumulated showing that economic agents respond differently to incentives and information than traditional economic models would usually predict.

The union of all these experimental works and the psychological work discussed above led to modelling exercises on aspects such as “social preferences” (other-regarding preferences), which refer to the way people consider the utility of others through, for example, a sense of justice or aversion to inequity (Bolton and

[6] In the ultimatum game, a player is given a sum of money and asked to divide it between himself and an anonymous player. The taker can either accept the dealer's proposal or reject it, in which case neither player will receive anything. From a traditional game-theory perspective, the allocator should only offer an insignificant amount, and the taker should accept it. However, the results showed that most allocators offered a non-negligible payment, and many went so far as to offer an equal split. Some takers rejected some offers, suggesting that they were willing to make a sacrifice when they felt the offer was unfair.

Ockenfels, 2000; Charness and Rabin, 2002; Fehr and Schmidt, 1999). This research resulted in the formal development of behavioural game theory, or the study of how emotions, biases, and social norms influence decision-making in strategic situations like business negotiations or political elections (Camerer, 2003). Behavioural game theory thus incorporates the idea that individuals often make decisions based on factors aside from economic self-interest, such as fairness, trust, and reciprocity. This has led to investigations of alternative mechanisms for addressing public goods problems and other market failures, as well as the creation of new behavioural models and empirical testing methods using observational and experimental approaches.

In short, behavioural economics has developed through research in two areas: the analysis of heuristics and biases, on the one hand, and the experimental analysis of behaviour in specific contexts of interest to policymakers, on the other. These two branches have thus led to behavioural economics attaining considerable success and influence, as evidenced by the awarding of multiple Nobel Prizes[7].

2.1.3. The influence of context

The psychological discoveries that have shaped the development of behavioural economics focus on human emotions, cognitive and behavioural processes, and the intricacy of social interactions. Specifically, cognitive psychologists and neuroscientists have expanded our understanding of the human mind's complex functions, while social psychologists and sociologists have illuminated the intricate ways in which environment and context influence thought, emotions, and behaviour.

Neuroscience has found (Arellano and Barreto, 2016) that the frontal part of the brain houses complex processes related to emotions, not just reasoning. In this way, emotions are automatically involved in decision-making and help us decide without our full awareness. The reason is that the conscious part is a fundamental brain element, but it does not seem to be the central component of the system. Thus, the brain manages high-speed unconscious processes where emotions and impulses are systematically mixed with calculation and decision-making. This

[7] Herbert Simon, who won the Nobel Prize in Economics in 1978, focused his research, as we have mentioned, on the "*decision-making process*", attempting to assess the limitations of people's ability to make decisions with incomplete or, at times, overwhelming information. In 2002, Daniel Kahneman also received the Nobel Prize for integrating research in psychology with economics and linking it to the analysis of personal judgments and decision-making under conditions of uncertainty. Other award-winning academics were Akerlof and Shiller (the former, earning the Nobel Prize in Economics in 2001 and the latter in 2013), who in "*Animal Spirits: How Human Psychology Drives the Economy, and Why It Matters for Global Capitalism*" (2009) point out that non-economic and irrational motivations intervene in the economy. Richard H. Thaler, co-author of *Nudge*, also received the Nobel Prize in 2017, for his pioneering work in establishing that people are predictably irrational and behave in ways that often defy economic theory.

duality is similar to the metaphor of the rider and the elephant[8], proposed by Jonathan Haidt (2012), or the two systems of thought proposed by Kahneman (2011): System 1 is fast, automatic, frequent, emotional, stereotyped, and subconscious, and its role is to generate intuitions that often serve us well but not always. System 2, on the other hand, is slow, infrequent, logical, calculating, conscious, and requires effort. Its role is to make final decisions after observing and controlling the intuitions of System 1.

Research in **cognitive psychology and neuroscience has**, in short, **shown that human decision-making is influenced by fundamental cognitive processes, such as perception, attention, and memory,** and their significant limitations. For its part, research in **social psychology and sociology has contributed to understanding that decisions are highly contextual**, shaped by multiple aspects of the circumstances in which a decision is made and by past experiences that affect how each individual perceives the world.

These two core sets of ideas -the multiple cognitive influences on decision making and the influence of context on how decisions are made[9]- have laid the **foundations for studying the design of the framework in which decisions are made, known as "the choice architecture**" (Thaler, Sunstein and Balz, 2010).

2.2. Heuristics, biases, and choice architecture

2.2.1. Biases and heuristics: classification and implications

Research on learning shows that cultural and social contexts interact with cognitive and biological processes throughout life to influence thinking, memory, and learning, all of which affect decision-making. Therefore, recognising how cognitive and non-cognitive forces interact with the surrounding environment, as well as the attention individuals pay to the specific context in which they are making decisions, makes behavioural economics models different from those of other disciplines.

Among the cognitive processes we can highlight:

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8 It is used to illustrate the relationship between our rational mind (the rider) and our emotional side (the elephant). In this analogy, the rider controls the reins and, in theory, should guide the elephant; however, in practice, the elephant, with its great size and strength, often determines the course.

9 In Danziger, Levav, and Avnaim-Pesso, (2011) an experiment was conducted by recording the judges' daily deliberations in three different decision sessions, separated by two daily lunch breaks. It was observed that the percentage of favourable rulings gradually decreased from approximately 65% to almost zero in each decision session and abruptly returned to 65% after a break. These findings suggest that judicial decisions can be affected by external variables that should not influence rational legal decisions.

i. **Perception:** individuals interpret information through their mental frameworks, shaped by their prior knowledge and experiences, leading to notable differences among people. These perceptions can be distorted because the mental framework influences those mental representations, which, in turn, affect decisions.

ii. **Attention:** the capacity to pay attention is constrained by contextual factors and the costs involved in gathering information. Consequently, people often overlook relevant options.

iii. **Memory:** people often recall events selectively or influenced by their emotional state, which can affect decisions.

Given the inherent limitations of the aforementioned cognitive processes, people resort to heuristics: mental shortcuts that simplify decision-making in situations of uncertainty or information overload, and that avoid having to deal with the complexity or uncertainty associated with decision-making[10]. Although these shortcuts enable people to act swiftly and with less mental effort, they can also lead to systematic deviations from a rational behaviour model, known as cognitive biases, which often operate unconsciously. The behavioural economics literature has dedicated special attention to their identification, understanding, and potential control or modulation of their effects (DellaVigna and Linos, 2020; Dhami, 2016; Hummel and Maedche, 2019; Samson, 2020), with hundreds of different cognitive biases documented and multiple classifications existing for grouping them (BIT, 2017; IRS, 2017; NASEM, 2023; OECD, 2019b; Peón and Antelo, 2021).

This study will follow the NASEM proposal (2023), which categorises **biases across five fundamental axes**:

1. Limited attention and cognition

The degree to which people understand, pay attention to, and process information is crucial in any decision. However, individuals have a limited capacity to focus on important aspects of their environment, and they often struggle to process and

[10] Heuristics relate to the fact that we have limited cognitive resources to process and analyse all the stimuli we are exposed to. The concept was introduced by Herbert Simon, who proposed that, as a result of the systematic use of heuristics, individuals do not seek "optimal" outcomes but rather "satisficing" outcomes (Simon, 1956). That is, we settle when something is "good enough". Tversky and Kahneman (1974) popularized the concept of heuristics, identifying several main categories and showing situations in which the use of heuristics leads to significant errors in judgment. For example, they identified the "availability heuristic", by which we tend to estimate the probability or frequency of events in a specific category based on how easily we can mentally represent examples of that category. The availability heuristic causes, among other things, that we tend to overestimate the importance of highly “visible” events (e.g., a plane crash) compared to more probable but less striking events (e.g., cardiovascular disease).

comprehend information. They can become overwhelmed by complex information and make mistakes even when faced with simple problems.

Box 1. Common biases related to limited attention and cognition

- ***Statu quo* bias**. People tend to stick with the *statu quo* unless there are strong reasons to change. This occurs even when the costs of changing the current situation are very low (Samuelson, 1988). This bias explains, for example, why we keep subscriptions to services that are no longer useful. It is exploited in strategies such as default options, which are effective because most people choose the preselected option, even if it is not the most beneficial.
- **Cognitive overload**. Our attention, processing, and memory abilities are limited, so we cannot process all the information (Mullainathan & Shafir, 2013). Therefore, an overload of options exhausts us, leading to poor decisions or indefinite postponement (Iyengar & Lepper, 2001).
- **Saliency bias**. It makes us more attracted to things that stand out and are more striking (for example, products placed at eye level in a supermarket).
- ***Hassle factors***. Small friction or inconvenience prevent us from making the best decisions. For example, submitting information to apply for public aid on a long and complex form, or the fact that we must take additional actions or go through extra instances, causes us not to apply (Bettinger et al., 2012).

2. Inaccurate beliefs

Erroneous or biased beliefs or perceptions about situations, incentives, or personal abilities are common. These biases are often systematic, as they often originate from overoptimism, overconfidence, or memory biases that favour a more positive perception of memories than they actually were.

Box 2. Common biases related to inaccurate beliefs

- **Optimism bias**. People tend to overestimate the chances of positive events happening and underestimate the chances of negative events occurring in the future (Sharot, 2011). For instance, we might underestimate our risk of developing cancer and overestimate our future success in the job market**.**
- **Overconfidence effect** (Pallier et al., 2002)**.** It occurs when people's subjective confidence in their own ability exceeds their actual performance. A variety of problems have been linked to overconfidence, including the high number of entrepreneurs entering a market despite low chances of success (Moore and Healy, 2008). Among investors, overconfidence has been associated with excessive risk-taking (Hirshleifer and Luo, 2001), concentrated portfolios (Odean, 1998), and excessive trading (Grinblatt and Keloharju, 2009). This bias is also connected to phenomena such as the "planning fallacy", which is the tendency to underestimate the time needed to complete a task (Buehler, Griffin, and Ross, 1994), a factor relevant to various aspects of public administration work, such as public procurement procedures**.**

- **The halo effect**. This is a cognitive bias where positive impressions of people, brands, and products in one domain positively influence our feelings in another area. This idea originated in social psychology and initially described how an overall evaluation of a person can influence our perception of their unrelated traits. For instance, a friendly person is more likely to be seen as having a pleasant appearance, while a cold person might be perceived as less attractive (Nisbett & Wilson, 1977).
- **Confirmation bias** (Wason, 1960). It occurs when people seek or evaluate information in a way that fits with their existing thinking and preconceptions. The field of science, where theories should be advanced based on both disconfirming and supporting evidence, has not been immune to this bias, which is often associated with people processing hypotheses in ways that end up confirming them (Oswald & Grosjean, 2004).
- **Availability heuristic**. This is a heuristic where people judge the likelihood of an event based on how easily an example, instance, or case comes to mind. For instance, investors might assess the quality of an investment based on recent news reports, ignoring other relevant facts (Tversky and Kahneman, 1974).
- **Representativeness heuristic**. It is used when we estimate the likelihood that an object or event A belongs to class B by examining how much A resembles B, while disregarding information about the overall probability of B occurring. (Kahneman and Tversky, 1972)[11].
- **Loss aversion**. It is a cognitive bias that describes a person's tendency to prefer avoiding losses rather than making equivalent gains (Kahneman and Tversky, 1979).

3. Present bias

People tend to focus disproportionately on immediate problems, paying less attention to future benefits and consequences. This preference for instant gratification, as we value present events more than future ones, can lead to **present bias or hyperbolic discounting**[12], if it leads to dynamically inconsistent preferences: that is, at the initial moment we choose action plans that are very difficult or impossible to implement when the time comes. Present bias can help

[11] So, for example, if someone is known to be an opera enthusiast who enjoys visiting art museums, and a group of people is asked which of their most likely jobs is: a trumpet player in a symphony orchestra (option A) or a farmer (option B), a large proportion of people are likely to choose option A, because the description of the person fits the stereotype we might have about classical musicians rather than farmers. However, in reality, the probability of B being true is much higher because farmers make up a larger proportion of the population.

[12] Hyperbolic discounting represents present bias analytically. This means that, for example, a person usually prefers to receive €100 today rather than €101 in a week. Conversely, if both payments are delayed by a year, most individuals would rather wait longer and receive €101 in a week and in a year, rather than €100 in a year. The issue in the second case is that, as the payment date nears, the preference for immediate benefits intensifies, making most individuals opt for the former choice instead.

explain the difficulty in quitting smoking (Giné, Karlan and Zinman, 2010) or in saving enough to cover future expenses (Hershfield et al., 2011).

Present bias is also linked to other issues, such as people's usual difficulty in accurately identifying their future preferences (Ariely and Loewenstein, 2006) or in learning from past experiences (Kahneman, 1994).

4. Reference dependence and framing

People compare decisions using reference points (such as the current *statu quo*), especially when they involve trade-offs or probability estimates. They are also highly sensitive to how information is presented (framing).

Box 3. Common biases related to reference dependence and framing

- **Framing**: it can influence how attractive an option appears depending on how the alternatives are presented. For instance, the same information can be shown with a loss or gain based perspective (a bet with a 90% chance of losing vs. a bet with a 10% chance of winning). Although the outcome remains the same, the loss-based framing tends to trigger loss aversion, leading to higher rejection (Kahneman and Tversky, 1979).
- **Anchoring bias**. The tendency to place greater emphasis on the first piece of information received about a topic, even if that information is irrelevant or incorrect, is known as anchoring bias. This bias can influence financial decisions, for instance, by using stocks past price as a reference to judge its future performance. Likewise, if we are initially shown the inflated original price of a product before seeing its discounted price, we are more inclined to see the discount as a bargain, even if the final price remains high. The original price acts as an anchor that skews our perception of the product's true value.

5. Social preferences and norms

Decisions are strongly shaped by social norms and comparisons with others. People try to conform to implicit rules and socially accepted behaviours (values, actions, and expectations) and assess their actions against those of their peers.

For example, household energy consumption is influenced by social norms. Sending information to households about their energy use compared to their neighbours can lead to decreased consumption (Allcott, 2011; Kuehnhanss, 2019). Information about what others are doing creates an implicit social norm that shapes individual behaviour. This example demonstrates how social norms can be utilised to encourage more sustainable behaviour.

Box 4. Common biases related to social preferences and norms

- **Reciprocity bias**: our behaviour is frequently shaped by our subjective perceptions of fairness or justice. Consequently, we tend to mirror others' actions with corresponding responses, whether positive (rewards) or negative (punishments) (Fehr & Gächter, 2000b).
- **Social norms**: we tend to simply copy the behaviour we observe in others or act in ways we believe others expect of us, especially when there is uncertainty about the most appropriate behaviour in a situation.
- **Halo effect**: *see Box 2*.

All these dynamics interact with the environment and cognitive processes, such as perception, attention, and memory, showing that human decision-making is far from purely rational.

As understanding of heuristics and biases grew, a key question arose: should public policies assist individuals in making better decisions, and if so, how? This sparked a debate about the legitimacy of public intervention influencing personal choices to steer them towards more beneficial options. The debate marked a turning point by shifting the focus from describing and categorising heuristics and biases to emphasising **choice architecture** and designing tools to influence the choices individuals make in these environments, such as **nudges**.

2.2.2. The choice architecture

Thaler and Sunstein (2003) introduced the idea of "libertarian paternalism," which suggests that individuals' limited rationality can lead to poor choices. Therefore, it is justified to offer small advice to help improve their decisions in areas such as pensions, savings, investment, or consumption, without restricting or altering the range of options available.

Later (2008), they clarified that "a choice architect is responsible for organising the context in which people make decisions", emphasising that, in the presence of biases and heuristics, and aware of the multiple cognitive and contextual influences on decision-making, the design of the framework in which decisions are taken will systematically influence the choice, even if the content remains the same. This "choice architecture" is therefore unavoidable, since some form of design will always exist, even if it has not been consciously devised.

The choice architect can implement various types of interventions in different ways, including manipulative or obstructive methods (such as dark patterns or sludge), as well as interventions aimed at enhancing individuals' competence or autonomy to make better decisions (“boosts”, proposed by Hertwig and Grüne-Yanoff, 2017), or designing decision contexts that encourage behaviours that improve “health, wealth and happiness” (nudge).

2.2.3. Nudges

From these ideas, the concept of nudge, developed by Thaler and Sunstein (2008), was established. According to these authors, a nudge can be defined as "any aspect of the choice architecture that alters people's behaviour in a predictable way without forbidding any options or significantly changing their economic incentives". Furthermore, it is noted that the intervention must be cheap to avoid.

Nudge design should follow two fundamental principles:

- First, "libertarian paternalism" implies that these interventions should seek to influence behaviour only to improve people's quality of life (*nudge for good*), without limiting their freedom of choice, even if some decisions might be harmful, which is why nudges should be easily avoidable.
- Second, nudges must ensure compatibility between stimulus and response (*altering behaviour in a predictable way*), so that the instrument is consistent with the desired action or response.

To achieve this, it is vital to understand how cognitive processes —perception, attention, memory— shape the way people process information and make decisions. Systematic limitations and biases can be exploited or countered through nudges (Sunstein, 2018). For instance:

- Some nudges **offer information** to aid people in making better choices, such as calorie labels on foods, which encourage healthier selections.
- Others make certain **choices easier or more difficult**, with the goal of guiding behaviour, such as highlighting healthy foods in cafeterias and making them more accessible or convenient.
- Nudges can also **mitigate cognitive biases** by promoting long-term reflection or by increasing the visibility of information about risks or benefits of certain actions. For instance, pointing out the future effects of smoking can counteract the present bias, which causes people to favour immediate rewards over future advantages.
- In other cases, nudges succeed precisely because they **exploit biases**. One example is default rules, which leverage inertia and procrastination, such as automatic enrolment in savings plans, where people tend to stay with the default option.

The relationship between nudges, processes, and cognitive biases is intricate, but their effectiveness depends on designing decision-making environments that respect individual freedom while promoting beneficial choices. It is essential to emphasise that nudges do not aim to manipulate or deceive, but rather to assist

individuals in making better decisions ethically and transparently. Understanding how cognitive processes and biases interact with the environment enables the creation of more effective interventions tailored to people's needs.

To choose the appropriate type of intervention, it is crucial to understand the key biases that affect the decision-making process being examined. This will enable behavioural intervention strategies to be tailored to promote the desired behaviours. NASEM (2023) proposes several particularly effective strategies for altering individual behaviour.

Table 1. Intervention strategies Mapped to the Five Foundational Principles

Strategies	Foundational Principle and Everyday Meaning				
	Limited attention and cognition	Inaccurate beliefs	Present bias	Reference Dependence and Framing	Social Preferences and Social Norms
	"I don't know what I want"	"I think I know what I want"	"I want it now"	"I want this more than I want that"	" I want to do what others are doing "
Default options	X		X	X	
Choice sets and active choice	X	X		X	
Simplification	X		X	X	
Framing	X	X		X	
Hassle factors		X	X		X
Behaviourally informed incentives	X		X	X	
Commitment devices			X		
Reminders	X		X		
Fresh Start Effects			X	X	
Foot-in-the-door			X	X	
Social proof	X	X	X	X	X
Social comparison	X	X		X	X
Mental models		X	X	X	
Feedback	X			X	X
Altruism primes			X		X
Reciprocity primes					X
Salience primes	X				

Source: NASEM, 2023. Note: the table shows the relationship between various behavioural intervention strategies, or nudges, and categories of cognitive biases. An "X" indicates that a strategy is particularly effective for addressing a specific bias category.

If there are different types of nudges that might be suitable for changing a particular behaviour, the final decision on which nudge to use could depend on other factors, such as the ease of implementation, the specific context or situation in which it is applied, and so on.

Below, the different types of nudges are explained in detail, along with practical examples of how they might be suitable for each behavioural intervention.

a) Default options

Default options are effective at aiding decision-making and have a notable influence. In fact, several systematic reviews and meta-analyses have demonstrated that they generally exert a stronger effect than other intervention methods. They are especially useful when people are unable or unwilling to spend time evaluating options and making fully informed choices (Johnson & Goldstein, 2003).

Some examples of effective default options in the US include voluntary enrolment in employee retirement plans (Madrian and Shea, 2001), generic drug prescriptions (Patel et al., 2016), and default menu options to promote healthy food choices (Vecchio and Cavallo, 2019).

Box 5. Examples of default options (OECD, 2017)

- **Retirement Savings (United States)**: the "Save More Tomorrow" programme leverages individuals' inertia and loss aversion to boost retirement savings. Employees are encouraged to commit to increasing their pension plan contributions whenever they receive a pay rise. By linking the increase in savings to a future event, the sense of immediate loss is reduced, making the decision to save more easier.
- **Organ donation (Spain)**: some countries, including Spain, have adopted a presumed consent system for organ donation, where individuals are assumed to be willing to donate unless they specify otherwise. This measure has helped increase organ donation rates.
- **Setting up double-sided printers**: making double-sided printing the default option can reduce paper usage, saving resources and lowering environmental impact.
- **Donations to charities**: on certain platforms, the option to make a small donation to a charity is pre-selected when making a purchase.
- **Automatic pension enrolment (UK)**: this measure has significantly improved retirement savings rates. Switching from the default option to automatic enrolment removed the inertia barrier and exploited the *statu quo* bias.

b) Active choice

When it is not feasible (or desirable) to implement a default choice, requiring active selection can also be effective. These interventions establish a stopping

point in a process, prompting a person to make a decision before proceeding, thereby encouraging conscious consideration of alternative options.

Box 6. Examples of active choice

- **Travel insurance choice**: when purchasing a plane or train ticket, the system prompts the customer to actively select whether to add travel insurance, rather than automatically including it or leaving it unchecked. This ensures the buyer considers the option before completing the purchase.
- **Carbon offsetting on flights**: when purchasing a plane ticket, some airlines offer the option to add an additional fee to counteract the flight's carbon emissions. Instead of automatically including the fee, the customer is asked to decide whether they wish to contribute, which encourages environmental awareness and lets individuals participate voluntarily.
- **Consent to commercial communications**: when subscribing to a service or purchasing a product online, many companies ask users to make an explicit choice about whether they wish to receive commercial offers or marketing information.

c) Choice sets

Organising and restricting options can enhance decision-making, reduce cognitive overload, and prevent hassle factors. For instance, studies on health insurance plan choices have shown how the way options are described and presented can significantly influence decisions, often leading to suboptimal selections (Bhargava, Loewenstein, & Sydnor, 2017). The presentation of alternatives can be designed to lessen the cognitive burden of comparing multiple attributes without enough information (Bhargava & Manoli, 2015; Kling et al., 2012).

Generally, simplifying choice sets can assist people in better understanding available options and making more informed decisions. This can be achieved (OECD, 2017):

1. Limiting the number of available options.
2. Presenting information clearly and succinctly.
3. Using straightforward and easy-to-understand language.
4. Grouping options into meaningful categories.
5. Emphasising the most relevant or popular options.

By streamlining choices and easing decision-making, public policies can be more effective and deliver improved results.

Box 7. Example of choice sets (OECD, 2017)

- **Retirement plan lesson (UK)**: UK's Financial Conduct Authority (FCA) conducted an experiment to see how the way retirement income options were presented influenced consumers' choice between different pension alternatives plans.

  The researchers presented participants with different decision frames, including a consumption frame (which emphasised the amount of money consumers could spend in retirement) and an investment frame (which highlighted the profitability of different options). The results showed that the way options were presented had a significant impact on consumers' decisions, suggesting that simplifying the choice set and presenting information clearly and concisely can lead to better decision-making.

d) Framing

When lack of attention and cognitive load create barriers to behaviour change, emphasising crucial information or features of a choice can be effective. One specific strategy is loss framing, which exploits loss aversion and the endowment effect to highlight the negative consequences of inaction, which can sometimes be more motivating than a profit framing (i.e., emphasising the positive outcomes that will occur if action is taken).

Box 8. Examples of *framing*

- **Reducing food waste (France)** (OECD, 2017): a study examined how message framing can influence consumers' willingness to purchase “imperfect” food (fruits and vegetables with cosmetic flaws —ugly food). Researchers discovered that authenticity framing (“imperfect foods are just as good as perfect ones”) and anti-food waste framing (“buying imperfect foods helps reduce food waste”) were more effective at boosting willingness to buy these products than simply emphasising price discount.
- **Text added to a form’s signature field (Denmark)** (Ponce, 2022): in an effort to increase the inclusion of the correct attachments in a form, two sentences were added to the signature field. The first sentence readed: “AVOID DOING IT AGAIN: Please be aware that if you do not make sure attaching the correct and appropriate documents you will be asked to complete this form a second time”. The second sentence readed: “Not sure which attachments to include? Then call 7220 0030.” The first sentence invoked loss aversion, while the second provided help by highlighting the importance of attaching the correct files.

e) Behaviourally informed incentives

Financial or material incentives can motivate people to adopt desired behaviours, such as quitting smoking or enrolling in pension plans. A specific example would be tax policies, which aim to stimulate, incentivise, or encourage behaviours that enhance the functioning of the tax system.

Box 9. Example of behavioural incentives in tax policies

- **Tax lotteries** (Ponce, 2022): to reduce the informal economy, citizens are encouraged to pay or collect electronically, with rewards such as a fixed prize or the chance to win a substantial lottery prize. These schemes, with various nuances or linked to VAT, are found in Portugal, Uruguay, Colombia, Greece, the Netherlands, China, and Korea.
- **Information letters and system certification (Spain)**: sending effective, proportionate, and dissuasive letters. The State Tax Administration Agency in Spain (AEAT) has been sending information letters, which do not initiate any proceedings, politely communicating the surprising discrepancies with the figures for its sector. Other measures include the implementation of a public certification system for accounting software.

f) Commitment devices

These are tools that enable people to pre-commit to a future decision, which can be useful in addressing a lack of self-control. For instance, providing options for individuals to pre-commit to saving a portion of their future salary can help boost long-term savings. Likewise, time management or digital wellbeing apps can be used to set usage limits for certain apps and block access once the allocated time is exceeded. This promotes a healthier relationship with technology and effectively reduces screen time.

g) Reminders

Reminders, especially those that mention future goals, can be useful for helping people stay focused on their long-term aims. Their effectiveness seems to increase when sent at key moments or when individuals are most motivated to make decisions, such as the start of the year or on their birthday. In the healthcare sector, this kind of nudges are often employed. These includes sending text messages or emails to remind people of their medical appointments.

Box 10. Example of reminders

Reminder notices (UK) (OECD, 2017): the National Health Service (NHS) in the United Kingdom conducted two randomised controlled trials (RCT) to evaluate the impact of persuasive messages in SMS appointment reminders. Different framings were tested, including references to the specific cost of missed appointments, social norms, and empathy. The results showed that reminders that mentioned the specific cost of missed appointments were more effective in reducing the no-show rate.

h) "Foot-in-the-door" strategy

This type of nudge employs the strategy of requesting a small action followed by a larger commitment, thereby gradually shifting the frame of reference. It is an effective method for progressively altering behaviour. This approach is often utilised in fundraising campaigns or for public health objectives. For instance,

asking people to sign a petition supporting an environmental cause before requesting a donation. By securing a small initial commitment, the chances of people accepting larger requests in the future are increased.

i) Social proof

These interventions utilise this bias to provide descriptive data about targeted social choices and behaviours, using it to reduce risky or harmful behaviours (such as excessive alcohol consumption) or to promote positive behaviours (such as energy saving). This can be helpful in addressing the challenge of inaccurate beliefs, for example, by reporting statistics on the population's actual behaviour.

Box 11. Example of social proof (OECD, 2017)

- **Promoting compliance with tax-free savings account limits (Canada)**: the Canada Revenue Agency (CRA) employed behavioural insights to enhance compliance with tax-free savings account (TFSA) regulations. Letters were sent to account holders who had exceeded the contribution limit, featuring messages that appealed to social norms and simplified reporting. The findings demonstrated that these letters were more successful than traditional compliance notices in encouraging account holders to withdraw their excess contributions.
- **Increasing business survey response rates (Ireland)**: the Office of the Revenue Commissioners in Ireland used behavioural insights to boost the response rate to business surveys among SMEs. Letters were sent to companies emphasising the importance of the survey for policymaking and appealing to a sense of civic duty. The results showed that these letters significantly raised the response rate.

j) Social comparison

This approach aims to explicitly compare an individual's performance with a specific group or relevant reference. There are very effective examples when the comparison is not anonymous and individuals can openly compare themselves with those references. Altruism or reciprocity bias can be utilised.

Box 12. Example of social comparison (OECD, 2017)

- **Water saving (Costa Rica)**: in an experiment carried out in Belén, Costa Rica, households received information about their water usage compared to the local average. Households that used more than average received a "sad face" sticker, while those that used less received a "happy face". This straightforward feedback, which leveraged the social norm of comparing oneself with neighbours, reduced water consumption by 3.5% to 5.6%.
- **Payment of contributions for foreign domestic workers (Singapore):** Singapore's Ministry of Manpower (MOM) also leveraged social norms to encourage timely payment of contributions by foreign domestic workers. Reminder letters sent to delinquent employers included the message "96% of employers of foreign domestic workers pay their contributions on time".

k) Taking advantage of social influence or the halo effect

Engage celebrities or respected opinion leaders to endorse or demonstrate the desired behaviour.

Box 13. Examples of halo effect

- **Environmental awareness through public figures associated with environmental causes**. Public figures can participate in campaigns to influence consumer habits, for example, by encouraging people to reduce plastics, leveraging the "halo effect" of their public image to encourage environmentally friendly behaviour.
- **Reducing alcohol consumption among young people**. Public figures, such as musicians or athletes, may endorse moderate alcohol consumption or "responsible drinking". By observing influential individuals they admire advocating moderation, young people might be more inclined to emulate them behaviour.

l) Modification of mental models

To challenge inaccurate beliefs using techniques such as visualisations, analogies, simulations, or critical reflections.

Box 14. Examples of mental models

- **Use visualisations to demonstrate the long-term effects of climate change**: presenting complex information in an engaging and clear way can help people better understand the issue and alter their perceptions.
- **Financial health analogy**: to better understand financial management, compare saving and investing to caring for a plant or garden (just as a plant grows with consistent care and patience, savings grow with small, regular contributions). This analogy helps change the mindset that saving requires immediate, large sacrifices, encouraging a long-term view of growth.

m) Hassle factors

Minimising administrative obstacles or barriers, such as reducing bureaucracy by making options accessible digitally, boosts the success and effectiveness of an initiative. Many countries, including Spain, have adopted digital platforms to facilitate access to government information and services[13]. Lowering administrative barriers promotes increased citizen participation and can enhance satisfaction with public services.

n) Simplification

[13] For Spain, the "*General Electronic Access Point*", a web portal, offers a single point of access for citizens to information about Public Administrations and their administrative procedures (https://administracion.gob.es/).

Simplifying information reduces cognitive load and hassle factors, facilitating decision-making. This involves streamlining forms and using checklists.

Box 15. Example of simplification (Ponce, 2022)

- Madrid City Council handles approximately three million traffic violations each year. However, citizens have been struggling to pay quickly, even though a 50% discount on the total fine is offered. Once this issue was identified, an assessment of the linguistic and communicative quality of the violation notification document was carried out, and a new document was developed. The city council ensured that citizens could clearly identify the responsible authority, the person filing the complaint, the reported incident, and the steps to follow upon receiving the notification. Simultaneously, the relevant administrative procedure was simplified, and the notification's graphic design was improved.

2.2.4. Sludge

Behavioural economics has recently integrated the concept of sludge, a term introduced by Sunstein (2022)[14]. It refers to excessive and unjustified friction that hinders people from completing administrative processes or accessing public services. These include barriers such as complicated forms or unclear instructions, long wait times without updates on the process status, or redundant or insufficient requirements to prove eligibility.

According to the OECD (2024b), sludge wastes unnecessary time and resources, such as in responding to queries caused by a lack of clarity. It erodes the perception of fairness and accessibility in public services and raises dropout rates in programmes aimed at vulnerable groups, thereby reducing the efficiency and effectiveness of public policies. Added to this are the psychological, financial, and time costs that damage citizens' trust, increase frustration, and worsen inequalities.

Although these dynamics have been studied for years, especially in public management, the introduction of a common term has allowed it to be systematised, giving professionals a shared language and making it easier to identify, measure, and eventually eliminate them. In this context, ***sludge audits*** have emerged. These are structured methodologies, still in their early stages but increasingly used, that enable the identification, quantification, prevention, or elimination of these barriers in public procedures and services.

Although there is no standard methodology yet, the typical sequence of a sludge audit would be as follows:

[14] While Thaler previously wrote an article titled "*Nudge, not sludge"* (Thaler, 2018) in which he used the term *sludge* to describe activities that were essentially "nudging for evil", Sunstein, however, uses it instead as regards to a process that makes a specific decision harder to reach. The term is often used in this latter sense, but both appear in the literature.

1. **Behavioural journey mapping**. The micro-actions a user performs from the start to the end of their interaction with a service are documented. For instance, to receive financial assistance, users must first search for information, then collect documents, and finally submit their application.
2. **Data collection**. It is essential to collect both quantitative and qualitative information about the times, experiences, and obstacles faced. This involves interviews, analysis of existing data, and surveys.
3. **Cost assessment (time and effort)**. Determine how long users take at each stage and identify points of dropout or frustration.
4. **Inclusion and equity analysis**. Examine how sludge disproportionately impacts particular groups, such as older people or people with disabilities.
5. **Prioritising frictions**. Critical areas where improvements will have the greatest impact are identified, taking into account both the effort required and the potential benefits.
6. **Design and implementation of solutions**. Using behavioural approaches, we aim to simplify the process (e.g., restructuring forms to be clearer and more concise, automating redundant processes, or providing interactive and dynamic guides on digital platforms), and then assess their impact.

Box 16. Practical example: death registration in New South Wales

An audit was conducted in Australia to enhance death registration, which is a stressful process for families. Key findings included:

1. A three-day delay in 20% of cases due to errors in documentation.
2. A confusing process that generated 7,000 calls and 14,000 emails annually to technical support.

Solutions adopted:

- Simplification of instructions.
- Automatic alerts to prevent errors.
- Real-time updates on the status of the application.

Results: significant improvements in the perception of ease of the process, which increased from 69% to 74%.

To prevent these audits from becoming one-off interventions and to encourage their consolidation as standard practice in public administrations, the OECD (2024b) proposes nine guiding principles for their design and implementation:

1. **Assess whether conducting a sludge audit is suitable**. Before starting an audit, it is vital to consider the institutional context and available resources. Using decision matrices can assist in determining whether it is practical and beneficial for a specific service**.**

2. **Apply a step-by-step approach to identify and measure sludge**. Predefined methodologies, tested in various contexts, provide rigour, consistency, and the ability to compare results across different services or jurisdictions.
3. **Adapt the audit methodology to match available capacity**. Teams with different levels of experience can carry out audits. While knowledge of behavioural science or customer experience practices is useful, it is not mandatory. Teams lacking this experience can benefit from mentors or guides.
4. **Utilise tools to systematically gather, organise, and analyse data**. Audit tools, such as the Sludge Finder developed by New South Wales, are valuable for guiding the process, organising data, calculating load metrics, and prioritising identified issues frictions.
5. **Accommodate non-linear and varied behavioural journeys**. Behavioural journeys are not always straightforward and can differ greatly between users. Mapping these paths ensures that different trajectories and experiences are taken into account when engaging with a service.
6. **Apply an equity perspective throughout the audit process.** Using an equity approach helps identify how *sludge* disproportionately affects vulnerable communities. This includes incorporating equity checklists or frameworks to guide each step of the process.
7. **Incorporate feedback to challenge assumptions about sludge**. Collecting and analysing information before, during, and after the audit is crucial. This may include interviews, surveys, and site visits to gain a better understanding of user experience and to validate proposed solutions.
8. **Take action to reduce sludge and assess progress**. Audit results should be translated into tangible interventions to decrease friction, considering both potential positive and negative impacts, as well as the institutional context. It is important to measure the impact of these actions with subsequent assessments audits.
9. **Enable a sludge prevention programme**. This involves establishing clear commitments to user-centred services, designing institutional arrangements that promote friction reduction, and integrating user opinions and data throughout the service system.

Driven by its 2024 Recommendation on Human-Centred Public Administrative Services, the OECD has announced that it will soon publish an International **Sludge Audit Methodology**, drawing on international experience and collaboration from the *International Sludge Academy* and the *Fixing Frictions report* (OECD, 2024b).

2.3. Applicability

Jia and Mustafa carried out a bibliometric analysis of (2023) nudge studies published up to 2021, using a repository of 1,706 publications identified in Web of Science. The results show that nudge studies have gone beyond the field of behavioural economics, expanding into multiple disciplines, and that the number of publications on nudge has risen significantly since 2012, particularly since 2018. The studies were primarily conducted by American academics[15], followed by European countries such as England, Germany, and the Netherlands, while no relevant contributions have yet been observed from other countries with a research tradition.

Table 2. Countries with the most publications on *nudges* in the period 2012-2021

Country	Number of publications	% of the total
USA	631	41%
England	260	17%
Germany	159	10%
Netherlands	116	7%
Australia	79	5%
Canada	73	5%
France	73	5%
Italy	71	5%
Denmark	54	3%
Sweden	32	2%

Source: Jia and Mustafa (2023).

They also conclude that, while economics is the discipline most associated with nudging, its prominence is not as high given the increasing search for applications in medical sciences, ethics, political science, business, and communications. However, the search for applications in public administration, healthcare, and sustainable consumption remains particularly significant, in line with the goal of nudges to enable the public to make the best decisions regarding their health, wealth, and well-being. Finally, it highlights the digital environment as a major

[15] The 1,706 publications were distributed across 79 countries, but the top 10 countries with the highest number of publications accounted for 90.7% of the total. The United States ranked first with 631 publications, representing 37% of all publications, well ahead of the United Kingdom, which ranked second (15.2%), followed by Germany (9.3%).

area of study, especially after the introduction of the concept of digital nudging[16] (Weinmann, Schneider and vom Brocke, 2016), and the necessity for transparency and ethics in the design and implementation process to prevent misuse of technology.

Table 3. Main research categories of *nudge publications* between 2012 and 2021

***Web of Science* Categories**	**Number of publications**	**% of the total**
Economics	226	13.3%
Public, Environmental Occupational Health	116	6.8%
Ethics	102	6.0%
Psychology Multidisciplinary	94	5.5%
Political Science	78	4.6%
Public Administration	77	4.5%
Law	74	4.3%
Social Sciences Biomedical	72	4.2%
Multidisciplinary Sciences	70	4.1%
Business	69	4.1%
Environmental Sciences	69	4.1%
Nutrition Dietetics	69	4.1%
Computer Science Theory methods	67	3.9%
Health Care Science Services	67	3.9%
Environmental Studies	65	3.8%
Social Issues	65	3.8%
Medical ethics	63	3.7%
Management	60	3.5%
Computer Science Information Systems	59	3.5%
Meteorology Atmospheric Sciences	52	3.1%

Source: Jia and Mustafa (2023).

[16] Which refers to the use of user interface design elements to guide people's behaviour in digital choice environments or architectures (for example, in long online forms, to reduce abandonment, progress bars are incorporated that advance as the user completes sections, thus reformulating the task into manageable and visible steps).

2.4. Effectiveness

Evidence indicates that the results of nudges are mixed[17]. However, in many cases, it is observed that even very low-cost interventions can yield high benefits for both individuals and society as a whole[18]. This emphasises the fundamental idea that a behavioural approach can offer a starting point for designing and evaluating public policies from a more comprehensive perspective, by incorporating factors beyond economic rationality that affect citizens' decisions, potentially increasing their effectiveness.

Of particular interest is the work of DellaVigna and Linos (2020), which carried out a meta-analysis of 165 evaluations affecting over 24 million people. Specifically, the article examines projects undertaken by two of the leading behavioural economics units, the Behavioural Insights Team (BIT) in the United Kingdom and the Office of Evaluation Sciences (OES) in the United States. These projects involved 345 public interventions from different levels of government, in areas such as health, education, and taxation. All studies from these two institutions were included, both published and unpublished. The analysis found a clear positive impact of nudges, estimating that the projects resulted in an average behavioural improvement of more than 8%.

2.5. Criticisms and challenges

2.5.1. Critique of “libertarian paternalism” and the lack of transparency

A common criticism of behavioural instruments is that they can undermine individual autonomy or involve a certain degree of manipulation of individual decisions themselves. (Gigerenzer, 2015; McMahon, 2015; Wright and Ginsburg, 2015). This is especially true because these interventions subtly influence

17 Hummel and Maedche (2019) report that 62% of the nudges were statistically significant.

18 The academic literature on nudges is abundant with examples of nudges that have proven effective in different contexts. For illustrative purposes only:

- Thaler and Benartzi (2004) showed that changing the default option to automatic enrolment in pension plans (*opt-out* vs. *opt-in*) significantly increased participation in savings plans.
- Bettinger et al. (2012) found that simplifying student financial aid application forms (FAFSA in the U.S.) increased college enrolment by 8%.
- Alcott (2011) showed that letters sent comparing a home's energy use with that of efficient neighbours reduced energy consumption by 2-5%.
- By rearranging healthy foods in cafeterias to make them more visible, Wansink, Just, and Payne (2009) observed a 25–30% increase in fruit and vegetable consumption.
- Milkman et al. (2011) discovered that requesting people to schedule specific vaccination times increased vaccination rates by 4%.

behaviour and often take advantage of cognitive processes that are not necessarily conscious. As a result, individuals are less likely to recognize a behavioural intervention than one based on conventional instruments, eroding the principle of accountability that should govern the actions of public authorities.

A typical response to these observations is that many public policies are already paternalistic to some extent (NASEM, 2023)[19]. Thus, they reflect the regulator's preferences regarding behaviours that are considered desirable or not (for example, as with the so-called "merit goods"), meaning behavioural instruments are nothing new in this context. In fact, as "soft" instruments, the level of intervention can be reduced compared to alternative policy approaches. Additionally, they are compatible with transparency and public scrutiny[20]. Studies, such as Bruns et al. (2018), demonstrate that increased transparency does not substantially affect the impact of interventions.

2.5.2. Estimating the costs associated with behavioural instruments

Individual behaviour is not driven solely by economic incentives, and we often rely on heuristics that enable quick decision-making without thoroughly evaluating different options. Some behavioural interventions aim to counteract the effects of heuristics by encouraging rational and reflective deliberation, which can introduce evaluation and decision-making costs. Additionally, when interventions are based on social norms, they may carry significant psychological costs, sometimes referred to as the "moral tax" to explain the emotional cost associated with violating a social norm[21]. These costs should also be included in the assessment of such interventions (Tor, 2023).

2.5.3. Scalability and replicability

The effectiveness of alternative interventions can differ significantly, sometimes to an extent that is difficult to foresee during the planning stage. It may even be

19 According to "choice architecture theory", no context is neutral, and inaction also has its effects. From this perspective, the goal is to establish a choice architecture that maximises social well-being, does not limit available options, and remains transparent.

20 According to Ponce (2023) most nudges are not manipulative: labels, warnings, and reminders are clear and familiar messages. Default rules should be transparent; they could only be considered manipulative if the nudge in question is opaque or makes it more difficult for people to make a different decision. To prevent this, nudges should be governed by the principle of publicity.

21 For example, Damgaard and Gravert (2018) examine sending email reminders to potential donors for charitable causes (a relatively non-invasive intervention), estimating the cost of the inconvenience of receiving the reminders at approximately $2.

the case that successful interventions in one context or for one group do not apply to other situations[22].

NASEM (2023) concludes that "*the field of behavioural economics has made significant advances over the past 20 years, producing evidence about both general principles and specific intervention approaches that address policy challenges in many domains. However, the field has not yet produced generalizable and implementable practice guidance and intervention design strategies for determining what works, when, and for whom. Whether the goal of providing such specific guidance can be achieved, given the importance of context and the unique characteristics of many targets of behaviour change, is not clear*".

More specifically, the report (NASEM, 2023) notes that, despite compelling evidence across all settings and contexts that behavioural economics-based intervention strategies can have significant effects, it remains challenging to apply this evidence beyond the scale and scope of a focused research study. Specifically, it notes that *"a substantial number of individual studies of interventions have been carried out across the six domains we explored, but far fewer studies have followed up promising results with replication studies and systematic efforts at scale*".

2.5.4. Heterogeneity of effects

There are criticisms that behavioural economists do not pay enough attention to the effects of the tools they design on economic and social inequalities. One concern is that behavioural biases may tend to influence populations with varying levels of education differently, leading to interventions having unintended unequal impacts or indirectly harming those who are not targeted[23].

There is also criticism that they have not paid adequate attention to ensuring that their research is representative of diverse populations. Although a significant amount of notable behavioural research has been conducted in developing country contexts over the past twenty years (Duflo & Banerjee, 2009; Duflo, Glennerster, & Kremer, 2007), most behavioural economics research has taken place in developed countries. Consequently, the body of evidence on many

[22] For example, Brown et al. (2013) analysed the effect of changing the default temperature at one OECD headquarters, finding that a 1°C reduction resulted in a decrease in the average temperature recorded throughout the day, while larger temperature reductions had no effect because employees actively adjusted the temperature back to a level similar to the initial temperature.

[23] The individuals most receptive to a nudge may be those who make less biased decisions, or vice versa, leading to inefficient results at the aggregate level (Allcott et al., 2022).

behavioural challenges and intervention approaches so far is mainly based on data collected in Western countries.

2.5.5. Effect size

Another common criticism is that, although behavioural interventions can be applied in a wide range of settings and often have low implementation costs, their positive effects, measured by their ability to alter behaviour, are typically modest[24]. This result suggests that a nudge may not be the optimal tool in every situation.

Some research suggests that the effects of different interventions might be cumulative[25], thereby increasing the overall results (NASEM, 2023).

2.5.6. Duration of effects

Besides effect sizes, duration is also crucial. Often, results are desired not only in the short term but also in the long term. Some studies indicate that nudges can become less effective over time (Allcott and Rogers, 2014), or that, in the case of repeated and transparent nudges, their effectiveness may diminish as people perceive they are being influenced (Loewenstein and Chater, 2017).

[24] Furthermore, it is possible that the estimated effects in academic publications are significantly larger than those of actual large-scale interventions. The meta-analysis conducted by DellaVigna and Linos (2020) compares average effects in academic journals with those in interventions carried out by two *nudge units* in the United States. Although both samples show positive results, the average effects in academic publications are much larger, which the authors attribute to a mix of publication bias and low statistical significance of the results published in journals.

[25] Thaler and Sunstein already argued that nudges can be useful but are not a cure-all, and they do not rule out the possibility of combining them with orders, prohibitions and economic incentives.

3. BEHAVIOURAL ECONOMICS AS A TOOL FOR PUBLIC ADMINISTRATION

Behavioural sciences offer governments a novel array of tools —from integrating behavioural insights into the legislative process, particularly in the design, assessment, and execution of public policies, to employing nudges and sludge reduction techniques— capable of shaping citizen behaviour without resorting to coercion. Considering and integrating these approaches into the normative and regulatory frameworks may be advantageous for numerous reasons:

- **Positive impact at low cost**. Compared to traditional policies, which often require substantial investments in infrastructure or human resources, behavioural interventions generally offer a lower-cost alternative (Lourenço et al., 2016). A simple text message reminder to decrease absenteeism at medical appointments, a modification in the wording and presentation of a communication to boost voluntary tax payments, or a change in the placement of certain foods in a school cafeteria are some examples of very low-cost measures that can produce significant benefits.
- **Flexibility and adaptability**. Behavioural interventions can be easily adapted to suit different cultural, social, and economic contexts, enabling them to tackle a wide range of issues within diverse populations (OECD, 2017). Therefore, a nudge aimed at increasing public transport use in an urban setting can be adapted to promote the same behaviour in rural areas by modifying the message, channel, or incentive to suit local specifics. This flexibility enables public authorities to respond swiftly to the evolving needs of the area population.
- **Complementarity and enhancing effect of traditional instruments**. Behavioural interventions can complement established regulatory tools and, by integrating them, enhance the effectiveness of their outcomes (Dupoux et al., 2025). For example, combining monetary incentives with reminders, streamlined procedures, or social norm-based messages can boost the adoption rates of public programmes without substantially increasing costs.

In Spain, this toolkit can help to soften the conventional regulatory approach to administrative law (INAP, 2021) by offering less intrusive and restrictive alternatives, while also enhancing communication between the Administration and citizens through simpler and more accessible language. Additionally, its systematic inclusion in the ex-ante verification of proportionality during the drafting of new regulations should be considered: before choosing more burdensome options, it should be demonstrated that "lightweight" alternatives based on behavioural economics have been evaluated, which could achieve the same objectives in a less restrictive manner (Ponce, 2023). Therefore, public

administrations have a unique opportunity to strategically use these interventions, maximising the impact of policies with moderate cost and high social return.

However, their success relies on being specific, adapted to the context and needs of the population, and rigorously evaluated, both in terms of their effectiveness and their ethical acceptance. Only through careful design and robust outcome measurement can we ensure that behavioural interventions are not only effective but also legitimate and aligned with the values of transparency and collaboration that should underpin all public action. Ultimately, although they are not a silver bullet for all social problems, behavioural interventions have the potential to complement other public policies, maximising their impact at a relatively low cost.

3.1. National and international precedents

In Spain, the contributions of behavioural economics are still applied to a limited extent in the public sector, although there are relevant experiences that anticipate its potential[26]. An example would be the State Tax Administration Agency's (AEAT) gradual integration of the behavioural insights approach into its institutional strategy. Although it had been implementing actions aligned with this approach since 2017, it was not until the 2020-2023 Strategic Plan (and its addenda) that it explicitly referenced nudges, launching specific projects such as predicting errors in tax returns, simplifying documents and running preventative campaigns to enhance tax awareness. The 2024-2027 Strategic Plan reaffirms this commitment, planning the development of preventative campaigns aimed at preventing tax non-compliance, with particular focus on groups at greatest risk of non-compliance.

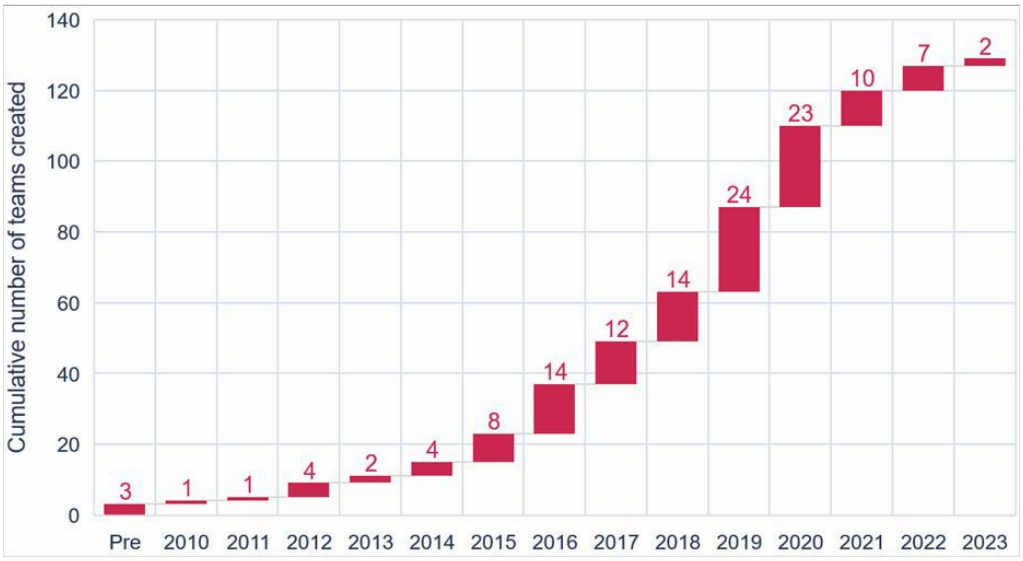
On the international stage, over the past 15 years, various governments and international organisations have published discussion papers, guidelines, and/or established bodies or departments within administrations (sometimes called "nudge units"), dedicated to applying knowledge from behavioural economics and designing and evaluating public policies and actions based on insights from behavioural sciences.

[26] In its report, *Behavioural Insights and Public Policy: Lessons from Around the World* (OECD, 2017), the OECD cites several initiatives undertaken by public institutions in Spain. These include the Spanish National Securities Market Commission (CNMV), which develops informative guides to educate investors about cognitive biases influencing financial decisions; the former Ministry of Industry Energy and Tourism, which implemented various diverse "soft" incentive programmes based on nudges within its scope of authority; and the Ministry of Finance, which designed a programme to enhance digital communication channels with citizens. In the case of the former Ministry of Industry Energy and Tourism, the programme to improve response rates in the Industrial Outlook Survey successfully increased the rate from 30% to 50%.

3.1.1. Beginnings and evolution

The deliberate integration of behavioural economics into the public sphere has occurred in various phases, usually in response to political opportunities or crises (e.g., the 2020 pandemic).

Figure 1. Age of government teams applying behavioural science



Source: OECD, 2024a.

Its rise to prominence started in the 2000s. In 2007, the Australian government held the first roundtable on the potential of behavioural instruments[27]. A year later, the United Kingdom, through its Department for Environment, Food and Rural Affairs (2008), conducted a pioneering study on the foundations of behaviour change applied to public policy.

At the European level, the 2011 Consumer Rights Directive is considered as the first EU regulation influenced by behavioural economics, as it highlights how default options in contracts influence consumers' final decisions[28].

In the United States, the application of this discipline gained momentum between 2009 and 2012 under the leadership of Cass Sunstein from the Office of Information and Regulatory Affairs (OIRA), focused on reviewing regulatory

[27] Productivity Commission, Australian Government. *Behavioural economics and public policy.* Melbourne, August 8-9, 2007. https://www.pc.gov.au/research/supporting/behavioural-economics .

[28] Directive 2011/83/EU of the European Parliament and of the Council on consumer rights. Article 22 states that traders must obtain the customer's explicit consent for any payment beyond the amount agreed for the trader's primary obligation and declares void any consent obtained through default options that the customer must reject to avoid payment.

changes from this perspective[29]. Later, in 2015, the White House Office of Science and Technology Policy (OSTP) created a Social and Behavioural Sciences Team (SBST), whose work was continued by the Office of Evaluation Sciences (OES) during the Trump administration.

The leading authority in this field emerged in 2010 with the British Behavioural Insights Team (BIT), part of the Cabinet Office, which advised other government departments. They specialised in working with models that more realistically addressed human behaviour, introducing methods similar to those used in medical studies, such as randomised controlled trials (RCTs). From being a government-owned unit comprising seven people, BIT has evolved into a global social-purpose organisation with 220 professionals and seven offices worldwide. According to its website, it has completed more than 1,700 projects in dozens of countries. This model has inspired countries such as France, Germany, and Australia.

Although these initiatives experienced a decline in popularity in the late 2010s, with some units or initiatives being abandoned or reorganised, behavioural units were revitalised during the COVID-19 pandemic due to the great potential for applying behavioural tools to public health issues (such as vaccination and mask use).

Since then, interest has expanded, as evidenced by the creation of units in other parts of Europe, the Middle East or South America (such as Chile in 2019, Finland in 2020, Oman in 2020, Argentina between 2021 and 2023 or Brazil in 2023). These initiatives have sometimes been supported by behavioural units established within international organisations, such as the World Bank or the BIT itself. These units serve as knowledge exchange platforms between established and emerging international working groups, in addition to promoting and supporting developing countries that seek to utilise behavioural economics in policy design.

3.1.2. Key features of *nudge units*

The work of any behavioural economics unit is typically organised around four main functions that support each other.

1. **Pre-emptive diagnosis and planning**. As an initial step in any regulatory action, the unit performs an ex-ante analysis of the behavioural factors related to the intervention, drawing on academic literature, administrative data, and/or fieldwork and experimentation. This analysis informs the development of recommendations tailored to the specific context, such as

[29] Through the Executive Order of US President Barack Obama of September 15, 2015, entitled: *Using Behavioural Science Insights To Better Serve the American People*, which is a clear argument in favour of behavioural economics.

behavioural evidence-based policies or behaviourally-informed policies. For instance, the U.S. OES collaborates with more than 30 federal agencies (including the Departments of Defence, Health, Education, Treasury, and Agriculture) to enhance public policies through evidence and experimental methods (including nudges). Examples of projects they have participated in include initiatives to increase health insurance renewal rates, boost participation in educational programmes, raise retirement savings for public employees, or reduce student loan delinquencies through personalised approaches messages.

2. **Ex-post impact assessment and dissemination of outcomes**. Once the intervention is designed, the unit rigorously assesses it and publishes the findings, including those where the results were null or insignificant. For example, the Behavioural Economics Team of the Australian Government (BETA) maintains a repository containing reports on its interventions, regardless of the outcome, which mitigates the risk of "publication bias", i.e., the systematic tendency to publish only successful results. Another example is BIN NL (the Behavioural Insights Network Netherlands), which produces reports and other materials on the use of behavioural insights in government, including the biannual publication "*A Wealth of Behavioural Insights*". This publication is a compilation of all behavioural sciences applications conducted within government and presented to the public and the Dutch House of Representatives, aiming to maximise transparency. By making this data publicly accessible, the risk of overestimating the effectiveness of certain interventions is reduced, and evidence necessary for designing and replicating rigorous public initiatives in similar contexts is spread[30].

3. **Training (capacity building) and sharing of experiences**. The accumulated knowledge facilitates the creation of training programmes, practical guides, and exchange networks that link stakeholders interested in applying behavioural economics, both with one another and with experts and academics. For example, in the Netherlands, BIN NL is an inter-ministerial network that connects all ministries and state agencies, promoting coordination and information sharing on behavioural economics interventions.

4. **R&D and continuous experimentation**. Some units are also dedicated to exploring new methodologies or testing pilot solutions for emerging problems. For example, in the United States, many city governments have innovation teams where behavioural scientists play a leading role. One of

[30] The most recent publication from 2023 includes 34 use cases of behavioural economics across different areas of government, a description of the scientific basis for the intervention, and an assessment of the final impact on citizens.

these is the Lab@DC, which employs behavioural tools and big data to tackle specific urban issues. Concentrating on concerns relevant to Washington, D.C., the Lab develops interventions related to transportation access, homelessness and housing support, education advancement, and more.

3.1.3. Organizational structure

The diversity of existing units shows that nudge units follow no closed solutions but rather have components adapted to each country, depending on its administrative capacity, public aims, and institutional tradition. Moreover, several modalities can coexist within the same country over time.

These units typically emerge organically, often due to increasing interest from public administrations which can lead to the formation of a nudge team or network, or they may be politically directed, with a centralised structure or as part of a collaborative network. There is also the possibility for certain administrations, particularly smaller ones such as city councils, to establish ongoing collaborations with actors specialising in behavioural economics, including consulting firms, NGOs, and academics, who either support their own units or manage the administrative behavioural interventions.

1. Centralised unit

They are established within a ministerial department or even linked to the Ministry of the Presidency, and are sometimes connected with or incorporated into public innovation teams. Some relevant examples are the OES in the US, the French *Direction Interministérielle de la Transformation Publique* (DITP), the Canadian Impact and Innovation Unit (IIU), BETA in Australia, or the British BIT in its early days. They tend to possess cross-cutting ambitions and strong coordination mechanisms.

They carry out their work by designing policies in collaboration with other ministries or agencies and providing guides and courses for the entire public administration.

Table 4. Behavioural units in central administration in different countries

	Behavioural Insights Team	**Office of Evaluation Sciences**	**Behavioural Economics Team of the Australian Government**	**Impact and Innovation Unit**	***Laboratoire sciences comportementales***
	BIT	OES	BETA	IIU	DITP
	United Kingdom	**USA**	**Australia**	**Canada**	**France**
Year	2010	2015	2016	2017	2017
Organisation Dependency	It was part of the Cabinet Office, now private (Nesta)	General Services Administration (GSA)	Dept of the Prime Minister and Cabinet	Privy Council Office	Ministry of Transformation and Public Function
Main topics	Education, environment, employment, health, digital	Health, taxes, savings, education, employment, housing	Health, education, social services, digital, climate	Sustainability, social services, health, housing	Sustainability, health, economy, inclusion, consumption
Nature	Private: owned by Nesta	Public	Public	Public	Public
Disclosure of results	Open	Open	Open,	Open	Open
Available information	Manuals, methodologies, academic articles, policy proposals	Reports, manuals, methodologies, academic articles, evaluation resources	Training hub, blog, podcasts	Limited	Training pills for transformation projects

Source: prepared by the authors. Note: this is not an exhaustive list.

2. **Interministerial network** consisting of different areas of government

This structure is often established following a spontaneous emergence of initiatives across various levels of a country's administration, universities, and so forth. Additionally, knowledge-sharing networks can be encouraged by the central government. The most notable example of decentralisation is in the Netherlands (BIN NL), where significant progress has been made in integrating behavioural economics into public policymaking, with multiple specialised units and teams across different ministries and public entities.

3. Nudge units with a sector-specific focus

In areas where behavioural science is more widely applied, many independent agencies have chosen to establish small nudge units or to use behavioural tools deliberately and systematically in policy development in specific sectors such as taxation, consumer protection, and health. Some examples are provided in the following table.

Table 5. Sector-specific behavioural units in different countries

Sector	Authority applying BI [1]	BI Department [1] (if it exists)
Taxation	Australia: Australian Taxation Office	
	United States: Internal Revenue Service	Taxpayer Behaviour Lab, within the Research, Applied Analytics and Statistics Division
	Singapore: Inland Revenue Authority	
Financial markets	United Kingdom: Financial Conduct Authority	Behavioural Economics and Data Science
	Australia: Australian Securities and Investments Commission (ASIC)	Behavioural Research and Policy Unit
	Chile: National Consumer Service (SERNAC)	Coordinación de Economía del Comportamiento en la Subdirección de Consumo Financiero
Competition and consumer protection	Australia: Australian Consumer and Competition Commission United States: Consumer Financial Protection Bureau	Decision-Making and Behavioural Studies Section
Health	United Kingdom: Health Security Agency	Behavioural Science and Insights Unit (BSIU) (see more)
	Canada: Public Health Agency	BeSciO
Education	Peru: Ministry of Education	MineduLAB
Environment	Peru: Environmental Assessment Agency	Grupo de Economía del Comportamiento

Source: prepared by the authors. Note: this is not an exhaustive list. [1] Behavioural Insights.

4. **Non-profit foundations** established by or led by an administration

By fostering a conducive environment and encouraging innovation, this kind of semi-public organisation enables the nudge unit to function as a consulting firm, collaborating with both the public and private sectors, as well as with other countries. It is mainly found in English-speaking nations, usually in the form of non-profit entities (charities). Examples include the British BIT (currently part of Nesta) or the Irish Behavioural Research Unit (BRU).

5. Regional and local units

Behavioural economics has broad applicability in policies that are more directly related to citizens. In this context, subnational governments have embraced behavioural sciences and established their own units focused on general or regionally specific issues and problems. For example, the NSW Behavioural Insights Unit in the New South Wales state government in Canada (NSW), a world leader in anti-sludge action, or the Lab@DC of the District of Columbia government in the US, which uses behavioural tools and big data to address specific urban problems.

6. Collaborations with third parties

Administrations with limited resources or aiming for quick results without creating permanent structures choose collaborative agreements with expert specialists.

Thus, the city council of New York works regularly with an external consultancy: the so-called “embedded behavioural design team” is established in collaboration with ideas42, one of the first behavioural insights consultancies established in 2008 as a non-profit project and was already involved in setting up the Social and Behavioural Sciences Team at the White House.

7. Teams in international organisations

Some international organisations have established their own nudge units to assist governments or institutions lacking internal capabilities. They focus on knowledge dissemination, technical assistance, capacity building, multinational experiments, and funding pilot projects. These include:

- **European Commission**. The Competence Centre on Behavioural Insights conducts research, advises other Commission departments, designs experiments in several Member States, and provides training to civil servants and public authorities, acting as a link between Brussels and national governments in this area.
- **United Nations**. The behavioural approach is used in various agencies within the United Nations ecosystem, emphasising scalability and the

potential to support developing countries. Among these is the World Bank, which has established the Mind, Behaviour and Development Unit. (eMBeD), UNICEF's Behavioural Insights Research and Design Laboratory (BIRDLab) or Behavioural and Cultural Insights (BCI) of the World Health Organisation.

- **OECD**. The Behavioural Science Team collaborates with public administrations in various countries, including Canada, Mexico, Ireland, Oman and Colombia, publishes guides and other materials and coordinates the OECD's Behavioural Research in Action International Network (BRAIN), which involves more than 100 government officials working on behavioural analysis initiatives in over 50 countries. Its recent report LOGIC (OECD, 2024a) codifies good practices and results from a 2023 workshop involving 35 government behavioural experts from 14 countries, as well as surveys of 200 teams[31].

Regardless of the governance structure chosen, international experience demonstrates that it is not necessary to begin with a large staff. According to the OECD report (2024a), **57% of units operate with fewer than four people.**

Figure 2. Size of government teams applying behavioural science

Source: OECD, 2024a.

Typically, it starts with a small team and resources are expanded as the integration of the behavioural approach into administration and political support is consolidated. To address the limited initial resources, collaborative repositories such as the Behavioural Evidence Hub (B-Hub) facilitate open access to validated behavioural tools and interventions[32].

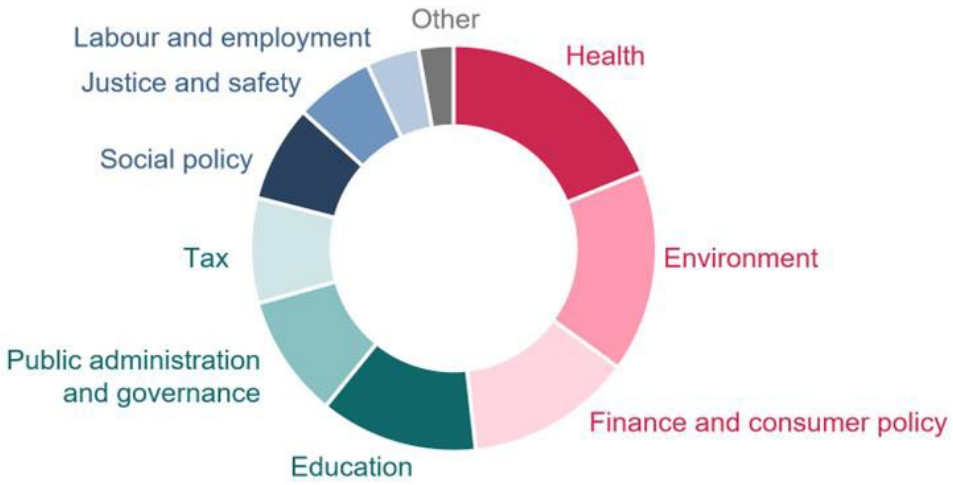
31 The countries most represented in the surveys were Australia, the Netherlands, the United Kingdom, and the United States, each contributing more than 10 teams and collectively accounting for over 39% of the survey.

32 The Behavioural Evidence Hub (B-Hub) is an open repository launched in 2017 by ideas42 and the Behavioural Science & Policy Association. It currently collaborates with the OECD, BIT, and the European Commission's Competence Centre on Behavioural Insights, among others. Its mission is to support public-sector teams, especially small ones, by disseminating knowledge about validated interventions, checklists, and technical resources that can be quickly reused or adapted.

3.1.4. Areas of intervention

The issues at the core of these units' work can be diverse, but patterns emerge that show a certain thematic convergence regarding the most common areas of intervention. These themes align with both the strategic priorities of the administrations leading this field and the accumulation of empirical evidence and related academic literature. It is no coincidence that much of the initial work of the nudge units has focused on the three broad areas identified in the foundational work of Thaler and Sunstein (*Nudge: Improving Decisions About Health, Wealth, and Happiness*), which also reflect the dominant focuses in academic literature, as seen in Jia and Mustafa (2023). The following figure illustrates the main areas of action, according to the classification provided by the OECD (2024a):

Figure 3. Policy topics to which behavioural science is applied



Source: OECD, 2024a.

Health-related initiatives, particularly those focused on treatment adherence, promoting preventive and healthier behaviours, and raising awareness during health emergencies like the COVID-19 pandemic, come in first place. Some notable interventions aim to increase vaccination rates, encourage healthier food choices, reduce the unnecessary use of certain medications, decrease absenteeism from scheduled appointments, and enhance participation in screening programmes (such as colonoscopies, mammograms, etc.) and follow-up appointments for chronic conditions.

Secondly, the field of **environment and sustainability** has been one of the most productive areas for applying behavioural approaches. Interventions have been designed to promote and facilitate recycling, encourage energy savings, and reduce the use of fertilisers and pesticides, using tools such as decision simplification and appealing to social norms.

Finance and **savings** remain key areas of focus. Interventions are aimed at encouraging active comparison of financial products without the need for switching, increasing retirement savings, and reducing over-indebtedness and defaults across various contexts, with promising results.

There are also other areas of action that are expanding. In the fields of the labour market and education, **gender equality** has become a significant focus, with initiatives aimed at increasing female participation in the labour market and reducing bias in hiring and education. Furthermore, given the rise of deceptive commercial practices and dark patterns, especially in the digital environment, **consumer protection** becomes a key component of these units' strategies.

Finally, **interaction with public administrations** is one of the areas that have seen the greatest progress in recent years. In this area, nudge units have concentrated on simplifying administrative procedures, enhancing institutional communication, increasing participation rates in social programmes, and redesigning forms.

The work of nudge units is gradually expanding into traditionally less-explored areas. International networks focused on the exchange of good practices and mutual learning, created by international organisations such as the OECD's BRAIN network, are addressing the needs of national units in the face of emerging challenges by forming working groups covering topics such as anti-sludge, competition policy, behavioural public administration, and artificial intelligence.

Ultimately, nudge units are not rigid structures applying universal prescriptions but as flexible institutional elements capable of adapting to the context, needs, challenges, and priorities of each administration. Their true value lies in their ability to incorporate a behavioural approach, based on evidence and experimentation, into the entire public decision-making cycle, tailoring solutions to the specificities of each country or region. This versatility, combined with a practical and empirical focus, explains their international expansion and their transformative potential for public action.

3.2. A methodology for incorporating the behavioural approach into regulation and public policies

Just as there is no universal nudge unit structure, there is no single standard for integrating a behavioural approach into regulations and public policies. The guidelines published by the OECD (2019b, 2023a, 2024a), the BIT (2014 (rev 2024), 2022), the European Commission (2021, 2023), and other institutions, as well as methodologies developed in academia (Costas-Pérez & Tucat, 2021), share the same philosophy and core principles (experimental and user-centred approach, continuous and iterative evaluation, etc.), but each incorporates its own nuances in the sequence of steps and the tools employed.

The methodology outlined below summarises some of these contributions, aiming to provide a flexible framework that can be adapted to the context, resources, and institutional culture of each administration, without in any way replacing the creativity and critical judgment of each team. Its value lies in the combination of robust conceptual foundations (behavioural theory, ethical component, clear goal setting) and a pragmatic approach based on experimentation and learning.

The methodology is divided into three sequential phases, each aimed at ensuring that interventions are effective, ethical, and tailored to the specific needs of the population, thus guaranteeing maximum success and social acceptance of these policies.

Table 6. Methodology for the design of behavioural interventions in public policies

PHASE 1: PROBLEM IDENTIFICATION AND DEFINITION OF OBJECTIVES
1. Define the problem and the behaviour to modify
2. **SMART Goals** (**S**pecific, ***M****easurable*, Achievable, ***R****elevant,* ***Ti****me-bound*)
3. Understanding the context - Understanding the environment - Analysis of existing policies - Qualitative and quantitative analysis of the target audience - Ethical implications

PHASE 2: DESIGN AND EXPERIMENTATION
1. Choosing the type of intervention
2. Intervention design following the EAST framework - ***Easy***: default options, remove obstacles and streamline processes - ***Attractive***: grab attention and encourage action - ***Social***: Harnessing the power of social influence - ***Timely***: The optimal moment to maximise impact
3. Choice of communication channel
***4. Ex ante* evaluation**

PHASE 3: IMPLEMENTATION, SCALING AND ONGOING LEARNING
1. Dynamic scalability strategy
2. Transparency
3. Continuous monitoring
***4. Ex post* impact evaluation**

Source: own elaboration.

3.2.1. PHASE 1: Problem identification and definition of objectives

Phase 1 establishes the groundwork for the success of the whole intervention and involves a detailed and accurate analysis of the behaviour to be modified and the objectives to be met. The steps to follow are:

1. Clearly define the problem

a) **What behaviour do you want to change?** First, it is needed to accurately identify the behaviour to change. It should be defined clearly and concisely, avoiding ambiguity.

Box 17. Examples of behaviours to modify

- **Increase tax payments**: specify the type of taxes, which taxpayer group the intervention targets, and the expected timeframe for a change.
- **Promote recycling**: clearly specify whether the change concerns plastics, organic waste, or another particular type, along with the target region or community and the anticipated timeframe for achievement results.

b) **Quantify the problem**: it is crucial to quantify the issue to understand its true scale. To do this, it is necessary to collect and analyse data that determine the frequency of the current behaviour, the number of people affected, and the impact this behaviour has on overall well-being. Quantification enables an objective assessment of the effectiveness of the intervention through measurable and comparable indicators, supporting an ex-post analysis to evaluate the intervention.

Box 18. Examples of quantification

- **Reducing plastic waste in public areas**. Let's consider the aim of decreasing plastic waste in an urban park. To measure the problem, an initial assessment of the waste collected in urban spaces at a specific site would be carried out. This could involve an audit over a set period, such as a week, during which both the total waste and the proportion of plastics collected in that area are documented. If it is found that 60% of the waste is plastic and an average of 500 kg of waste is collected weekly, we can estimate that about 300 kg of plastic are discarded each week in public spaces at that site. This quantification offers a benchmark for evaluating the effectiveness of measures taken to reduce plastic waste.
- **Increasing the vaccination rate in a specific child population.** If the goal is to raise the vaccination rate among children under 5 years in a region, it is essential to first determine the current rate within that population. Public health data may show that, in the region, only 70% of children under five are vaccinated. It is also known that this group consists of 10,000 children. Therefore, 3,000 children are currently unvaccinated. Quantifying this helps establish a baseline, set a clear objective for increasing the vaccination rate (for example, from 70% to 90% within the next year), and measure the success of the intervention aimed at improving vaccination coverage.

c) **Define the problem**: it is important to define the geographic and demographic scope of the issue. Is the problem limited to a particular region? Does it impact a specific age group or socioeconomic class? This information will help you target your intervention and maximise its effectiveness resources.

Box 19. Examples of delimitation

- **Promoting physical activity among older adults**: in the case of a campaign to encourage physical activity, the problem could be defined by focusing on adults over 65 years of age living in rural areas where access to physical activity centres is limited. Instead of implementing a general intervention for the entire population, the campaign could be tailored to this specific group and designed to consider their particular limitations and needs, such as the installation of accessible outdoor spaces or the development of low-impact physical activities programs.
- **Reducing food waste in supermarkets**: if the aim is to cut down on food waste, the issue could be refined by focusing on medium-sized supermarkets in urban areas where waste is highest due to lower turnover of fresh produce. By targeting a specific type of premises and geographic location, the intervention could incorporate strategies like donating produce to local organisations and launching campaigns to promote responsible consumption purchasing.

2. Set “SMART” goals

Once the problem has been identified, specific objectives must be established that reflect the desired change and offer clear guidance for designing and implementing the intervention. These objectives should be:

- Specific: clearly and unambiguously defined. Vague or general terms should not be used.
- Measurable: quantifiable to assess the progress and impact of the intervention. Specific indicators should be established to measure the change in behaviour.
- Achievable: realistic and achievable with the available resources. Goals that are too ambitious and impossible to reach should not be set.
- Relevant: aligned with political and social priorities. The objective must be meaningful and significantly impact public welfare.
- Time-bound: a specific timeframe must be set for achieving the objective. This enables the assessment of the intervention's progress and effectiveness over time.

Box 20. Examples of SMART goals

- **Raise the measles vaccination rate** for children under 2 in the Community of Madrid by 10% 2025.
- **Enhancing oral health in school-aged children**: raising the percentage of children aged 6 to 12 attending annual dental check-ups in Alicante from 50% to 75% by 2027.
- **Boost physical activity among overweight adults**: increase participation in physical activity programmes among overweight adults in the province of Malaga by 20% by 2028.

3. Understanding the context

Understanding the context in which the behaviour to be changed occurs is vital for a successful intervention. Therefore, it is important to understand the environment —such as social norms, barriers, and facilitators that influence the behaviour— as well as existing policies that may be addressing the issue and the data available on the target audience. With this contextual analysis, interventions can be tailored to the specific features of the environment, increasing the chances that the behaviour will be adopted voluntarily and naturally by the population.

a) Understanding the environment

This involves analysing:

- Social norms: what behaviours are deemed acceptable or desirable within the target group? For instance, posting messages in public restrooms indicating that most people wash their hands, such as "85% of people wash their hands before going out. Will you join them?" can promote adherence to this social norm of hygiene, encouraging individuals to adopt practices that help prevent the spread of disease. These behaviours are viewed as expected within society, and failing to follow them may be regarded as disrespectful others.
- Barriers: what factors (economic, social, cultural, psychological) hinder people from adopting the desired behaviour? For example, a lack of information, the complexity of the process, overly technical language, or a lack of trust in institutions can be obstacles to paying taxes.
- Facilitators: what factors might encourage the adoption of the desired behaviour? For example, the availability of clear and concise information, ease of access to services, or trust in institutions can encourage tax payment.

b) Policy analysis

An analysis of existing policies is essential: what policies are already in place to tackle the problem? Have they been effective? What lessons can we learn from them?

Box 21. Example of analysis of existing policies

- **Affordable housing policy analysis**. This analysis would focus on existing policies aimed at promoting affordable housing, such as rental subsidies, social housing, or tax breaks for homeowners. It would assess whether these policies are successfully providing affordable housing for low-income people, using indicators like the number of affordable housing units available, the proportion of income spent on housing among different socioeconomic groups, and the decrease in the homeless population. Additionally, the analysis could examine secondary effects, such as the influence on the housing market and potential displacement of residents caused by gentrification.

c) Analyse available qualitative and quantitative data from the target audience

Who is the intervention aimed at? It is crucial to clearly identify the target audience for the intervention. This involves segmenting the population based on demographic, socioeconomic, geographic, or behavioural traits. Understanding the characteristics of the target audience will enable the creation of a more tailored and effective intervention.

An analysis of the needs and motivations of the target audience should also be carried out: What drives individuals to act in a certain way? What needs or desires do they have? Gaining insight into the target audience's motivations will help design an intervention that is relevant to them.

Box 22. Example of target audience identification

Initiative to promote the use of public transport in metropolitan areas

- **Define the target audience**: the intervention could focus on "workers between 20 and 50 years old who live in suburban areas and commute daily to the city centre". This group might be chosen because they have consistent commuting routines and encounter similar challenges related to traffic and travel costs.
- **Additional segmentation**: within this group, we can identify those who occasionally use public transport and those who only travel by car. We can also segment based on the distance from their home to the nearest public transport station.
- **Needs and motivation analysis**: using surveys or other qualitative information, the needs and motivations of each segment can be assessed. For example, while many of these workers might be willing to use public transportation to reduce traffic stress and costs, they often face barriers such as a lack of direct connections, infrequent services, or the perception that it is less comfortable and reliable.

Similarly, the touchpoints for this target audience should be mapped, identifying the times and locations where people engage with public administration or with information related to the behaviour to change.

In this sense, a common technique used during the diagnostic phase for designing interventions is **User journey mapping** (Costas-Pérez and Tucat, 2021). It involves schematically illustrating all the decision points and actions individuals must go through before, during, and after performing a specific behaviour. Its aim is to pinpoint key areas where behavioural interventions can be applied to enhance decision-making. This type of analysis helps to understand how the environment, psychological barriers, and contextual factors influence user behaviour. Using user journey mapping, it is possible to identify obstacles such as lack of information, cognitive overload, or other elements of the process and environment that can either hinder or facilitate the desired outcomes behaviours.

Box 23. Example of data analysis and touchpoint mapping

Initiative to minimise plastic use in supermarkets

- **Qualitative and quantitative data**: quantitative data may include statistics on plastic bag usage per customer, the average quantity of plastic used during purchases, and the frequency of reusable bag use. Qualitative data would relate to understanding the motivations for using plastic bags, such as convenience or cost, and the barriers to using them, such as the lack of accessibility to reusable options bags.
- **Touchpoint mapping**: key touchpoints include reusable bag outlets, checkouts (where the decision to use a plastic bag is made), and the supermarket app or the supermarket entrance itself (where customers could be reminded to bring their own bags before shopping).

d) Consider ethical implications

Does the intervention respect people's autonomy and freedom of choice? It is essential to evaluate the ethical implications of the intervention. Behavioural interventions should be designed to uphold these principles. To achieve this:

- Transparency: policymakers must be transparent with the public about the use of behavioural interventions and the objectives pursued with the intervention.
- Proportionality: the intervention must be proportionate to the objectives pursued and must not impose an excessive burden on the people.
- Ethical assessment: there must always be an ethical safeguard proportional to the risk to protect rights and credibility. This mechanism can —but should not always— take the form of a formal Ethics Committee. One option is to adopt a tiered model (*checklist*→internal committee →external committee) in line with OECD guidelines (2022c).

Box 24. Example of an ethical analysis for an intervention designed to boost retirement savings

1. **Freedom of choice**: respecting workers' autonomy, allowing them to decide whether to participate in the savings plan, without imposing it as an obligation.
2. **Transparency and avoidance of manipulation**: clearly communicate information about the savings plan and, if automatic enrolment is used, ensure that employees understand it and can opt out of the plan at any time.
3. **Financial education**: offer free resources and workshops so workers can make informed decisions about their finances, without promoting specific financial products.
4. **Avoid social pressure**: avoid messages that generate guilt or pressure on those who cannot save, focusing on a positive approach that respects each worker's situation.
5. **Equity and inclusion**: design flexible savings plans accessible to workers at all income levels, with incentives for those with low incomes.
6. **Privacy and data protection**: protect the privacy of employees' financial data and use it only with their informed consent.
7. **Financial balance**: ensure that retirement savings do not jeopardise workers' current financial needs by guiding them on how to balance their goals.

This ethical approach ensures that the intervention is respectful, inclusive, and sensitive to the individual needs of workers.

In brief, Phase 1 of the methodology for applying a behavioural lens to regulation and public policies is an iterative process that involves a careful analysis of the problem, objectives, context, target audience, and ethical considerations. Conducting this phase properly is crucial for the success of the intervention.

3.2.2. PHASE 2: Design and experimentation

While Phase 1 focuses on a deep understanding of the problem, Phase 2 concentrates on designing the intervention and conducting experiments or pilot projects to assess its effectiveness.

In this stage, it is vital to establish the intervention strategy that will be used to change the behaviour identified in Phase 1. This involves:

1. Choosing the type of intervention: based on the principles of good regulation (necessity, effectiveness, proportionality, legal certainty, transparency and efficiency), this decision should be made through a thorough comparison of the available options: behavioural interventions, "traditional" instruments (such as prohibitions, obligations, or economic incentives), and even the choice of maintaining the status quo —that is, not intervening. It should be recognised that, even when selecting a traditional instrument, incorporating a behavioural approach into its design

—by taking into account the actual behaviour of recipients and the factors that influence it— can enhance its effectiveness.

2. Design the intervention: behavioural instruments, such as a nudges, require a creative approach based on a deep understanding of both the behaviour to be changed and the context in which it occurs. The BIT "EAST" framework offers a clear structure for developing ideas and designing effective interventions. The EAST framework is founded on four key principles: make it Easy, make it Attractive, make it Social, make it Timely.
3. Choice of communication channel: it is important to choose the most appropriate communication channel to reach your target audience. It is possible to use traditional channels, such as letters, brochures, or advertisements, or digital channels, including email, websites, text messages, and social media.
4. Ex-ante or pilot tests: to assess the effectiveness of the intervention and adjust or modify it based on the results.

1. Choosing the type of intervention

Choosing the most suitable type of intervention requires a comprehensive assessment based on empirical evidence and the principles that guide public action.

Sunstein (2013), drawing on his experience leading OIRA during the Obama administration, points out that there are specific contexts in which behavioural interventions are particularly effective. When citizens face complex decisions or cognitive overload, make choices in environments where inertia or procrastination occur, are strongly influenced by social norms, or are confronted with decisions involving long-term benefits and immediate costs, specific behavioural interventions such as default options, reminders, or changes in the decision environment can bring about decisive changes in individuals' behaviour at very low cost. Similarly, Sunstein suggests that behavioural interventions are especially relevant in situations where there is a desire to respect individual autonomy, a key aspect in democratic societies. However, he does not view behavioural interventions as substitutes for traditional regulatory tools, but rather as complementary instruments which are more suitable in some cases than in others.

In this context, the effectiveness of behavioural interventions should not be taken for granted. Evidence demonstrates, as the OECD consistently highlights in its reports (2017, 2019b, 2020a), that behavioural interventions are not a "silver bullet" capable of solving all public policy issues. In situations involving deep structural or material barriers (such as economic inequality, energy poverty, or

financial exclusion), when economic incentives are misaligned (e.g., overprescription of certain medications by doctors), when fundamental rights are at risk (e.g., personal data protection), when decisions are highly technical or rational (like legal decisions or complex medical treatments), or when structural reform is required (e.g., reform of the education system), traditional interventions may not only be more effective but also necessary. Even if this is the case, behavioural insights can still aid in enhancing the effectiveness of conventional approaches, for instance, by helping to resolve “last mile problems” (Soman, 2015) related to the implementation of public policies in general, such as compliance monitoring[33].

Finally, the option of not intervening should not be dismissed by default. The literature on effective regulation highlights that any intervention must be justified based on the principles of efficiency, including necessity and proportionality. If there are no circumstances that justify intervention, or if the costs outweigh the expected benefits, then inaction may be the most appropriate choice. When there are no clear behavioural biases, the potential benefits do not exceed the costs of intervention, and there is a risk of unnecessarily curbing citizen autonomy, "doing nothing may be the most prudent option" (Oliver, 2017). In this sense, behavioural sciences not only expand the available tools but also enable the refinement of problem diagnosis, thus allowing for a more accurate assessment of whether intervention is justified.

In fact, both in its guidelines (2021) and in its manual (2023) for the application of the principles of *better regulation*, the European Commission advises that an appropriate and proportionate assessment must be carried out at each stage of the regulatory cycle to determine whether less intrusive measures, such as behavioural interventions, are more efficient, transparent, and proportionate than those based on a legal mandate or a system of sanctions.

Ultimately, behavioural interventions should be empirically assessed and systematically compared with other types of intervention before being selected.

2. Intervention design

Once the type of intervention has been chosen, its design must commence. The process of "constructing the intervention" is a vital step in the methodology

[33] The concept of "last-mile problems" refers to the difficulties encountered in the final phase of a public policy, which is when it needs to be translated into concrete actions by the recipients, often arise from the gap between the technical design and the actual behaviour of the population. For example, a subsidy that requires annual renewal may not be renewed by citizens because they do not understand the form or miss the deadline. Behavioural interventions such as automated reminders, simplification of forms, automatic registration, or adjustments in the timing of the process could enhance the effectiveness of the traditional approach (in this case, the subsidy).

for integrating behavioural considerations into public policymaking. It goes beyond selecting the intervention instrument and can significantly affect its effectiveness. In this context, the EAST framework acts as a guide for generating ideas and designing high-impact interventions.

EAST is a simple and practical framework, based on four straightforward principles: **Easy, Attractive, Social,** and **Timely**. To encourage a behaviour, it must be made **easy**, for example, by harnessing the power of default options or simplifying messages and procedures. The action has also to be **attractive,** capturing attention through images, colours, or personalisation, and appropriately designing rewards and sanctions for maximum effect. The **social** aspect is also crucial, as it shows that most people perform the desired behaviour or use the power of social media to encourage collective action. Finally, **timing** is key, as it is needed to consider when people are most receptive to messages, considering immediate costs and benefits.

Make it Easy*:* remove obstacles and streamline processes

- Harnessing the power of default options: human inertia causes us to stick with the default choice. Changing the default to encourage the desired behaviour can lead to its acceptance. Automatic enrolment in pension schemes or organ donation are clear examples of this principle at work. In the United Kingdom, the pension participation rate increased from 61% to 83% following the introduction of automatic enrolment.
- Reduce the "hassle factor": any obstacle, no matter how small, can discourage action. Simplifying procedures, digitalising processes, reducing paperwork, or guiding users directly to the form they need to complete are examples of how to minimise friction and boost engagement. Simplifying processes, such as paying taxes, also increases user engagement.
- Simplify messages: clear, concise, and easily understandable communications enhance response rates. It is important to present key information early, use simple language, avoid jargon, and remove any irrelevant details. The message conveying the intervention should be clear and brief for the target audience. The language, tone, and format of the message should be carefully considered to ensure its effectiveness. For example, streamlining medical forms and developing clear self-care plans for patients reduced prescription errors and hospital readmissions rates.

Make it Attractive: grab attention and encourage action

- Grab attention: in a world flooded with information, the intervention needs to stand out. Using images, vivid colours, personalised messages, or elements that evoke an emotional response can draw in the user. An example of an intervention aimed at grabbing attention in a public health

context would be an anti-smoking campaign that features striking images on cigarette packs.

- Design rewards and sanctions to maximise their effect: financial incentives are a powerful tool, but they are not the only option. Lotteries, which exploit our tendency to overestimate the chances of winning, can be more attractive and lucrative than fixed rewards. Using appeals to scarcity, personal image, or gamification[34] techniques are other strategies to motivate behavioural change. For example, employing a lottery to encourage voter registration has proven to be more effective than traditional methods.

Make It Social: harnessing the power of social influence

- Demonstrate that most people engage in the desired behaviour: social norms are a powerful influence on behaviour. Showing that most people perform the desired action can motivate others to do the same. Campaigns that highlight the high percentage of people who pay their taxes on time serve as examples of this principle.
- Using the power of networks: people are influenced by their social environment. Leveraging existing networks to disseminate information, facilitate mutual support, and foster collective action can amplify the impact of an intervention. Online product comparison platforms, recommendation systems, and collective purchasing initiatives are examples of how networks can be used.
- Encourage people to commit to others: public commitments or commitments to people we respect make us more accountable. "Commitment devices" that involve others can increase the likelihood of achieving goals. Some fitness apps allow users to set physical activity goals and share them with friends or training groups. Committing to meeting the goal in a group makes people feel more motivated and responsible, as they do not want to let their teammates or friends down.

Make it Timely: the optimal moment to maximise impact

- Intervene at the optimal moment: receptiveness to an intervention depends on when it is introduced. Recognising transitional moments, such as moving house, births, or job changes, can boost the chances of success. During these times, people are more receptive to change and find it easier to detach from established routines.

[34] Gamification techniques are strategies that use typical game elements (such as points, rewards, levels, or challenges) in non-game contexts to motivate people and encourage their engagement in activities that might otherwise seem less engaging.

- Consider immediate costs and benefits: people generally prioritise immediate consequences over future ones. Developing interventions that provide immediate advantages or highlight short-term costs can succeed.
- Helping people plan: facilitating planning and identifying barriers can support individuals in achieving their goals. Creating a smoking cessation action plan exemplifies how planning can boost adherence.

3. Choice of communication channel

Once an intervention has been chosen and designed, the next crucial step is to determine the most appropriate communication channel to reach the target audience. This step is crucial to ensure the intervention achieves its desired impact. Therefore, it is advised to adhere to these steps:

- Target audience analysis: this can be achieved by using the information gathered during the problem identification and objective-setting phase. An appropriate communication strategy may be affected by the recipients' characteristics, their habits (what content and channels they use to consume information), their preferences, or their motivations. Similarly, the recipients of the communication may not be the same as the recipients of the intervention (e.g., initiatives aimed at children).
- Communication Channel Assessment: next, an assessment of the communication channels used by the target audience should be conducted to assess their suitability.

Box 25. Communication channels

Traditional Channels:

- **Letters**: allow for formal and personalised communication but can be expensive and take a long time to deliver.
- **Brochures**: useful for providing detailed information but their scope may be limited.
- **Ads**: enable a wide reach but can be costly and effectiveness depends on targeting.

Digital Channels:

- **Email**: enable direct, personalised communication, but can be ignored or labelled as spam.
- **Websites**: ideal for providing detailed and accessible information but require an attractive design and a good SEO (Search Engine Optimisation) strategy.
- **Text messages**: provide instant and direct communication but are limited in the amount of information they can convey.
- **Social media**: enable wide reach and direct interaction with the public but demand an engaging content strategy and consistent management.

Omnichannel, that is, combining multiple channels for a single intervention, can increase the likelihood of impact at the right time.

The choice of communication channel should depend on data gathered during the target audience analysis and an assessment of available channels. It is crucial to consider factors such as reach, segmentation ability, cost, and the expected effectiveness of the channel in delivering the message clearly and persuasively. Additionally, consistency between the channel format and the intervention design is essential. For instance, an engaging, visual message might have a greater impact on social media, while a nudge that encourages reflection or more detailed decision-making could be better suited to channels like email or websites.

4. Ex-ante evaluation

Carrying out an ex-ante evaluation between the design and mass implementation stages, using a rigorous and suitable experimental method, ensures that the intervention is grounded in solid evidence before scaling up, reduces risks, and enhances institutional learning.

a) From design to pilot phase

Once the objective has been established and the type of intervention, its design, and the communication channel to be used have been selected, it is advisable to conduct a pilot test to assess its effectiveness before implementation.

Table 7. Pilot test objectives, key questions and standard metrics

Purpose	Key question	Common metrics
Measuring the impact	Does the intervention produce the desired behaviour change?	Effect size, conversion/adoption rates, average treatment effect, relative risk, and other relevant metrics.
Optimise the design	Which version of the message/channel maximises the effect?	Average engagement, open rate, response rate differences, and other metrics.
Ensure viability	Are there any logistical, legal or ethical issues?	Average implementation time, unit cost, persistence of the effect over time, churn rate, and other relevant factors.

Source: own elaboration.

b) Experimental methods

The OECD (2023a) identifies seven experimental pathways or models that governments can employ to gather evidence prior to the large-scale implementation of an intervention. The following table summarises each approach:

Table 8. Seven routes to experimentation in policymaking

Method	Goal	Priority	Challenges
Randomized Controlled Trials (RCTs)	Investigate the effects of one or more policy solutions against a control group	Reliable test of the cause-effect relationship	- High costs (research funds, time, experienced personnel, creation of a control group) - Does not consider change over time - Does not explain why this relationship exists
A/B Testing	Compare the effect of two policy solutions	Fast(er) and cheap(er) comparison of two solutions effects	- Not as reliable as RCT (no control group) - Does not consider change over time - Does not explain why this relationship exists
Differences in Differences (*Dif-in-dif*)	Investigate the effects of policy solutions over a period of time	Estimate a candidate cause-effect relationship between a solution and its effects over time	- Not very reliable in assessing a cause-effect relationship unless randomisation - High costs (research funds, time, experienced personnel, creation of a control group) - Not explaining why this relationship exists
Before/after controlled tests	Compare the effect of a policy solution between two points in time	Fast(er) and cheap(er) comparison of the effect of a solution over time	- Not as reliable as *diff-in-diff* - Does not investigate more than one treatment - Does not explain why this relationship exists
Longitudinal studies	Understanding the behaviour over time of variables related to a policy	Broad quantitative overview on how different variables associated with a policy challenge develop over extended periods of time	- High costs (research funds, time, expert knowledge) - Does not explain why this relationship exists - Does not test cause-effect relationships
Correlational studies	Better understand which of the variables involved in a policy challenge are related to each other	Broad quantitative overview of how different variables associated with a policy challenge are related to each other	- Requires access to a large database - Does not explain why this relationship exists - Does not test cause-effect relationships

Method	Goal	Priority	Challenges
Qualitative studies	Investigate which/how variables are involved in a policy challenge and/or the starting point for solution designs	A rich and deep account of the factors behind a policy challenge, ideally formulating a testable hypothesis	- It is not as broad as longitudinal or correlational studies - Does not test cause-effect relationships

Source: OECD (2023a).

- ***RCTs*** as the "gold standard". among the various approaches, RCTs are regarded as the gold standard. When resources and logistics allow, they provide the strongest evidence. By randomly assigning participants to treatment and control groups, they reduce bias and unobservable factors. Therefore, any differences in outcomes can be confidently attributed to the treatment effect, reducing problems of endogeneity and selection bias. The key steps of an RCT are*:*

  1. Definition of the hypothesis: the causal relationship to be evaluated is established.
  2. Experiment design: treatments and optimal sample size are determined.
  3. Randomisation: participants are assigned to treatment and control groups strictly at random.
  4. Data collection: the behaviour or variable of interest is measured in both groups.
  5. Outcome analysis: groups are compared to identify significant effects and to estimate the magnitude of the impact.

- ***Alternative methods****.* However, RCTs can be expensive, time-consuming, and even unfeasible in some contexts. Under these circumstances, it is advisable to resort to more flexible methods. Field experiments allow interventions to be assessed in real-life settings without the need for strict randomisation[35], while quasi-experimental designs (such as difference-in-differences[36], regression discontinuity[37], and propensity score matching[38])

[35] For example, sending letters with persuasive messages using social norms to improve tax payment ("85% of people have already paid their taxes").

[36] It involves comparing the changes in a treated group and a control group (without the random distribution typical of RCTs) before and after an intervention.

[37] It is used when a policy has an eligibility threshold (for example, social benefits for people with incomes below a certain level). It enables comparison between individuals near this threshold to estimate the causal effect of the intervention.

[38] It is used to construct comparison groups similar in observable characteristics when randomisation is not possible.

leverage existing data to infer causality. Methods such as discrete choice experiments (DCE) help analyse individual preferences[39], and A/B testing[40], widely used in digital environments, facilitates the optimisation of messages and administrative processes. Longitudinal and correlational studies enable the mapping of trends, measurement of persistence and potential side effects, or the generation of new hypotheses when there is no experimental scope. Qualitative studies, through focus groups, interviews, or direct observation of participants, can serve as a starting point for detecting biases and frictions. Big data analysis and machine learning enable segmentation of populations and prediction of behaviours.

- ***The role of surveys and how to improve them.*** It should be noted that surveys are a widely used tool for collecting information on perceptions and preferences, mainly because they are easier to administer than other empirical methods. However, they have significant limitations, such as the possibility that reported responses may not accurately predict observed behaviour (e.g., voting intention) or that their external validity could be undermined if the sample is not representative of the target population. In this way, insights from behavioural sciences can help identify risks and enhance survey design for empirical analysis[41]. Some examples include: i) neutral question formulation and randomisation of order to avoid anchoring; ii) attention-seeking questions and response time control to detect satisficing (where instead of choosing the optimal answer, the first one that is "good enough" is selected to minimise cognitive effort); and iii) hypothetical incentives calibrated to bring responses closer to actual action.

In conclusion, although RCTs remain the most reliable method for assessing interventions, combining them with other methodological approaches offers greater flexibility and enables quicker decision-making, ensuring that interventions are grounded in empirical and relevant evidence.

c) Continuous monitoring and adjustment

During the experiment or pilot test, ongoing monitoring of the intervention's results is vital to spot areas for improvement and make adjustments to optimise its impact. Adjustments can be applied to various elements:

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39 Different options with diverse characteristics are presented, and individuals' preferences regarding these are assessed.

40 It consists of comparing the results of two versions of a message, interface or process.

41 In 2018, the CMA published its Guidance on good practice in the design and presentation of customer survey evidence in merger cases, which explains how to incorporate behavioural principles to improve the reliability and presentation of results.

- Message: the content, format, or tone of the message can be altered to make it more persuasive or to suit the target audience's preferences (Tor, 2023). For example, Madrid City Council modified the wording of traffic violation fines to emphasize the early payment discount, resulting in increased revenue collection (INAP, 2021).
- Communication channel: the communication channel can be changed if the desired reach or effectiveness is not being achieved (INAP, 2021). For example, the Spanish National Health System tested sending personalised SMS messages to inform recipients about the location and time of the COVID-19 vaccination, thereby promoting preventive behaviours among the population. Using SMS messages as an alternative approach proved effective, as it enabled more direct communication with the population.
- Implementation strategy: details of the intervention implementation, such as the frequency or timing of communications, can be adjusted. (Haynes et al., 2012). For example, sending reminders during times when more people are on their phones or computers.

Tracking each modification and its effect ensures traceability and helps inform future internal decisions and meta-analyses.

In summary, Phase 2 concentrates on selecting and designing the initiative, crafting the message, choosing the communication channel, defining the implementation process, and conducting pilot tests to assess effectiveness and refine the intervention.

3.2.3. PHASE 3: Implementation, scaling and ongoing learning

The implementation of the intervention is the final stage after a successful experiment or pilot test. Its main aspects include:

1. Dynamic scalability strategy

When scaling up a behavioural intervention, it is crucial to adapt the design, logistics, and communication to keep it effective and efficient. Moving from a pilot project (such as a town with fewer than 5,000 residents) to national public policy increases the heterogeneity of the population: the recipients, how they receive the message, and prevailing biases all change. If the “one-size-fits-all” approach is kept, the intervention may fail despite promising results in the pilot. Similarly, diagnostics are necessary to identify or anticipate where the ”voltage effect” may occur, that is, the systematic reduction in effect when scaling up.

It is also advised to organise the deployment of the intervention in stages, so that groups or territories are gradually included, each temporarily acting as a control for the next expansion, enabling learning as the intervention progresses expands.

Both in the *Scale* chapter of the *TESTS Handbook* (2022) and in a recent contribution (2025b), the BIT offers practical advice for addressing the challenges of this phase.

2. Transparency

Transparency serves as the foundation for the legitimacy of any behavioural intervention. This involves clearly explaining how the behavioural intervention functions and why it was implemented, thereby strengthening trust between citizens and the institutions that endorse it.

One of the main arguments in favour of behavioural interventions is that many of them, such as warning labels and reminders, are explicit in their operation. These examples demonstrate that not all behavioural interventions are covert and that, in many cases, their effectiveness does not rely on remaining hidden, contrary to the idea that behavioural interventions "work best in the dark". Transparency and ongoing scrutiny legitimise behavioural interventions, promote their ethical use, and enhance public perception (Sunstein, 2018). When citizens understand the purpose and benefits of a behavioural intervention, they are more likely to accept and support its implementation, thereby reinforcing the intervention's effectiveness and sustainability (Bruns et al., 2018).

Pre-registering behavioural initiative projects on an open-access portal and then publishing the results, whether positive, negative, or null, with aggregated data promotes transparency and contributes to the learning cycle (OECD, 2017).

3. Continuous monitoring

It is crucial to continue monitoring outcomes and any changes during the implementation phase. This enables the detection of unintended effects, the making of necessary adjustments, and ensures the intervention remains effective in the long term (OECD, 2017). Combining activity indicators to quickly monitor intervention scaling —such as emails sent, URL visits or QR code scans included in communications, and form abandonment rates— with intermediate behavioural metrics that verify the intervention's real effect —like link clicks, logins, programme enrolment, percentage remaining in default, and changes in the abandonment rate— enables issues to be corrected before they diminish the intervention's impact. In *Big shifts for behavioural science: getting more flexible and adaptive* (BIT, 2025a), the significance of monitoring (and the methods for implementing it) is examined in depth to enable continuous adaptation of interventions.

4. Ex-post impact evaluation

Monitoring should not be mistaken for the ex-post evaluation of interventions. Monitoring is ongoing, helps to determine whether implementation is proceeding as planned and provides real-time alerts for minor adjustments. Ex-post evaluation aims to perform a causal analysis of results and long-term impacts to verify if the intervention is truly effective and whether it is sensible to continue it in the long term.

Ex-post evaluation must address five fundamental questions*:*

1. Persistence of effect: does the change last after 12-28 months or does it disappear once it is no longer novel (OECD, 2019b)?
2. Equity and coverage: who changes their behaviour? Are there population segments where the effect is zero or negative (OECD, 2017)?
3. Cost-effectiveness of the intervention.
4. *Spill-overs* and risks: do they generate adverse distributional effects, substitute behaviours, or cognitive fatigue?
5. Lessons: are there adjustments that need to be made to increase effectiveness or reduce “voltage effect”? Has anything been learned that can be applied to other interventions?

To find the answers, evaluation designs with counterfactuals (which recreate an "alternative world" in which the intervention did not take place and allow the impact of the intervention to be estimated) and data that enable results to be compared over time are necessary.

Given the importance of this step, it is crucial to allocate resources and responsibilities for this analysis to prevent the evaluation from becoming a mere token exercise.

In short, an appropriate implementation strategy is vital to ensuring that behavioural interventions lead to large-scale positive changes. Careful planning, ongoing monitoring, and a willingness to make adjustments are essential for successful and ethical implementation.

3.3. Main challenges in incorporating behavioural instruments

3.3.1. Limits imposed by administrative law

If the administration takes action without citizens' knowledge of their influence, the principle of transparency for administrative rules and decisions is weakened. Moreover, if nudges are used without adequate empirical evidence, the principles of administrative effectiveness and efficiency are compromised, and public trust

is damaged if it feels that citizens are being experimented on without their awareness. Therefore, the use of nudges should be guided by:

- Principles of legality, transparency and responsibility.
- Ex-ante and ex-post evaluation mechanisms.
- Respect for the autonomy and freedom of citizens.
- Ensure these are complementary tools, not substitutes for administrative procedures and rights.

3.3.2. Conditions for effective integration in public interventions

There is widespread debate on how to effectively integrate behavioural science into public policies to tackle the criticisms and challenges mentioned earlier.

In this regard, in 2024 OECD published *LOGIC Methodology: Good Practice Principles for Mainstreaming Behavioural Public Policy*, which identifies five areas of action that behavioural economics units must follow to ensure sustainable and efficient integration of behavioural sciences. The five dimensions of the LOGIC framework are Leadership, Objectives, Governance, Integration, and Capabilities, and each dimension includes several good practice principles to facilitate its application and evaluation:

- **L**eadership refers to senior managers leaders requesting and advocating for behavioural science when relevant, and managers building and maintaining senior leaders' support for behavioural science.
- **O**bjectives refer to promoting the incorporation of behavioural science into strategic plans, monitoring its use over time, and improving internal organisational processes, rules and incentives to this end.
- **G**overnance focuses on establishing clear accountability, mobilising sufficient resources to ensure policy advice is informed by relevant and reliable behavioural science evidence.
- **I**ntegration aims to incorporate behavioural science into standard guidelines and procedures, enabling an environment that supports relevant evidence more likely to be sought, produced and heeded. Managers should ensure behavioural science is applied responsibly, openly, and with high integrity standards to build and maintain policymakers' and citizens' trust.
- **C**apabilities emphasise building broad literacy among policymakers, developing sustainable ways to access behavioural science expertise, through quality brokerage, and building mechanisms for knowledge dissemination and sharing.

The BIT also published a "*A Manifesto for Applying Behavioral Science*" in 2023, in which it attempts to respond to the challenges facing behavioural science through 10 proposals.

Box 26. A Manifesto for Applying Behavioral Science

1. Use behavioural science as a lens
2. Build behavioural science into organisations
3. See the system
4. Put RCTs in their place
5. Replication, variation, adaptation
6. Beyond lists of biases
7. Predict and adjust
8. Be humble, explore, and enable
9. Data science for equity
10. No "view from nowhere"

Source: BIT, 2023.

NASEM (2023), for its part, states that "*the process of translating research findings to effective, broad-scale, real-world applications is complex and, ideally, involves an interactive feedback loop that links theory, experimentation, design, evaluation, and implementation*". However, this faces several challenges, two of which are particularly prominent: the **accessibility of research** and the **capacity of policymakers to implement evidence-based policies.**

Indeed, one of the main challenges is data availability and transparency. Access to administrative data, even for researchers, is often subject to poorly justified procedures. From a behavioural economics perspective, this can also act as a "behavioural barrier" that discourages rigorous analysis and limits the generation of evidence for better policies.

Similarly, to gain the advantages of evidence, policymakers and other public sector actors must recognise its existence, understand its importance, and value its potential to address the problems they encounter (Linos, 2023). Since few policymakers have the time to delve into academic research, most seek to receive information efficiently and relevantly for their work. Several factors influence how easily policymakers access reliable and useful research. One common problem is "publication bias", which can distort understanding within a field, even for experts. Research that reports surprising or successful results (although not always replicable) tends to be more visible, which biases policymakers' ability to identify which evidence is truly applicable.

Furthermore, policymakers differ in their level of training and experience in understanding and applying academic research. This influences the importance

they assign to evidence in their work. Like anyone else, policymakers can be affected by behavioural biases, such as present bias and limited attention, which influence how they interpret new information.

According to NASEM (2023), there are two main avenues to strengthen policy makers' and practitioners' capacity to implement evidence-based interventions:

1. Interdisciplinary collaboration: collaboration among those trained in behavioural economics and those trained in implementation science or public management.
2. Improve training: improve training in behavioural economics and public administration to better prepare policy makers to collaborate in translating research ideas for real-world policy development and design (Grimmelikhuijsen et al., 2017).

Specialised intermediary institutions, such as nudge units, can bridge the gap between researchers and policymakers. Because these institutions help translate research findings into more accessible language, they make it easier for policymakers to understand key results, especially by synthesising large volumes of work and giving greater weight to rigorous studies. It is generally agreed that there is still no single formula for promoting the adoption of evidence-based policies. However, research into how training, collaborative networks, and communities of practice (such as *What Works Network* in the United Kingdom) contribute to the dissemination of knowledge within each institution is valuable

Box 27. Examples of best practices for training and integration of BI

Best practices developed by the Behavioural Economics Team of the Australian Government (BETA) provide concrete examples of how behavioural economics can be applied in a collaborative, formative, and effective manner. Two notable initiatives are the development of e-learning tools and the Behaviour Discovery Tool, which aim to facilitate understanding and the application of behavioural concepts in policy and programmes development.

1. The *eLearning tool* trains public officials in behavioural economics, enhancing their capacity to design and implement more informed policies tailored to citizens' behavioural realities. This practical and accessible training has proven to be an effective strategy for increasing awareness and application of BI in government.
2. The *Behaviour Discovery Tool* enables policymakers to identify problematic behaviour patterns and develop more targeted interventions. Through a structured approach, decision-makers can map the motivations and barriers citizens face in decision-making, allowing them to refine public policies to achieve better outcomes.

3.4. *Behavioural government*: how cognitive biases influence decision-making in public administration

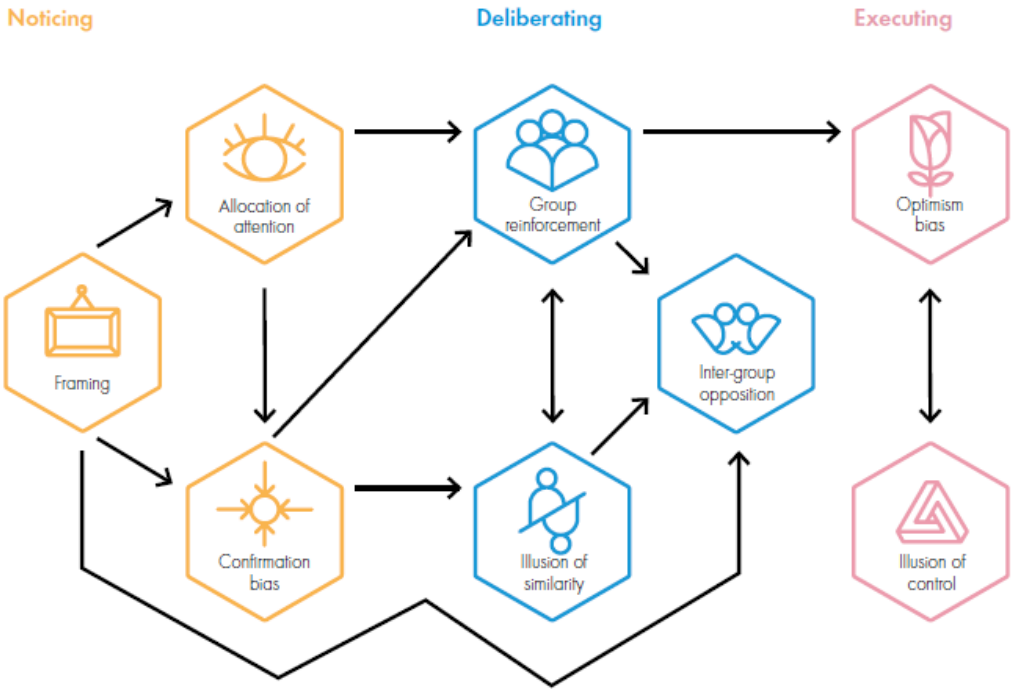
Public administration, like any other human organisation, does not operate in a perfectly rational way. The individuals within it —both civil servants and

politicians— are vulnerable to the same cognitive biases as other citizens. When these biases influence decision-making processes, they can result in inefficient regulations, services that do not meet actual needs, or measures that discourage the behaviour they were meant to encourage (sludge).

In this context, behavioural economics offers a strong and rigorous framework for identifying and addressing these issues. This not only enables the development of more effective interventions but also helps shield the government from cognitive traps it faces, such as confirmation bias that causes it to focus on evidence supporting the decision-maker's initial views position.

The evidence gathered by BIT (2018) indicates that biases influence the three key stages of public policy development: noticing, deliberating, and executing phases.

Figure 4. Biases in public policy design



Source: BIT (2018).

3.4.1. Policy formulation: how problems are presented and perceived

Public officials must define problems and design solutions within an institutional framework, but cognitive biases can influence their perceptions.

- **Framing**: the way a problem is presented affects the perception of its importance and the reactions it generates. A classic example in public administration is how statistics on service efficiency are communicated: saying "90% of cases are resolved on time" is not the same as saying "10%

are delayed", even though both statements convey the same message information.

- **Allocation of attention**: officials may focus on resolving visible or urgent issues that attract media attention rather than addressing structural problems, even if the latter bring greater social benefits. For example, managing citizen complaints might receive more focus than modernising administrative processes.
- **Confirmation bias**: in public administration, teams may seek information that confirms the desirability of already adopted policies, which makes it hard to consider more effective alternatives. This happens, for example, when digital technologies are adopted without a proper critical assessment of their benefits and risks.

3.4.2. Deliberating in public administration: influence of group interactions

The dynamics of work teams and institutional norms influence the decision-making process in public administration.

- **Group reinforcement**: officials might align with the majority view of their administrative unit rather than proposing innovative alternatives. This is especially problematic in organisations with a strong hierarchical structure culture.
- **Illusion of similarity**: there is a tendency to overestimate internal support for certain initiatives or policies within the administration. For example, a department may assume that a new regulation is understood and accepted by all employees, when in fact it requires further training.
- **Intergroup opposition**: in public administration, different units may see each other as rivals, which hampers interdepartmental cooperation. This is evident in disputes over resource allocation or in implementing cross-cutting reforms essential for the modernisation of the state.

3.4.3. Policy execution: risks in administrative application

Even when a policy or procedure is well designed, its implementation can be influenced by biases that lead to overestimating capabilities or underestimating risks.

- **Overconfidence and optimism bias**: administrative managers might overestimate the potential of a new management system or underestimate internal resistance to change. For instance, the shift to e-government has proven to be more difficult than anticipated in many cases.

- **Illusion of control**: there is a tendency to believe that implementing a regulation or programme will be entirely effective without the need for further adjustments. However, reality is often more complex and generally requires feedback mechanisms and ongoing improvement.

Ultimately, "behavioural government" reminds us public officials and managers are also vulnerable to cognitive biases that can influence decision-making. Strategies such as external evaluations, impartial reviews, forming focus groups, anonymising comments to prevent herd bias, assembling multidisciplinary and inter-ministerial teams, and establishing various probability scenarios, including a catastrophic one, can enhance the quality of public service and its impact on citizens.

4. BEHAVIOURAL ECONOMICS AND MARKET SUPERVISION

4.1. General considerations

4.1.1. Influence of cognitive biases on agents

According to the analysis framework proposed by the former OFT of the United Kingdom (2010), for consumers to make informed decisions that encourage companies to improve their products and compete with each other, they must meet three conditions[42]:

1. They must have **access** to relevant information about the offers available in a market.
2. They must **assess** the information available in a rational manner.
3. They must **act** based on this information, acquiring the products that best suit their needs.

Failure to meet the above conditions can sometimes be explained by factors that are compatible with perfectly rational behaviour. Additionally, behavioural economics offers further explanations that go beyond the assumptions of rational behaviour.

Cognitive biases can influence consumer behaviour in all three phases of the decision-making process.

- Inertia (*statu quo bias*), price-sharing policies, or information overload can prevent individuals from accessing information about the characteristics of goods.
- In the evaluation stage, the way consumers process information can be distorted by factors such as framing, limited ability to analyse complex information, the use of heuristics (rules of thumb), or biases related to the temporal valuation of losses and gains (such as overconfidence).
- Finally, it is also possible that consumers may correctly access and interpret information but still fail to act on it, even when switching providers involves no significant costs. This can also be caused by inertia in individual behaviour (small frictions or conveniences can have a disproportionate impact on decisions to act or not to act).

[42] Fletcher (2018) suggests a fourth stage in the consumer decision-making process: interaction with the market (*attendance*). That is, individuals must in the first place choose to start a decision-making process. This may be particularly relevant in markets where there are a significant number of "inert" consumers, meaning they do not make active purchasing decisions or do so infrequently, as is often the case in sectors such as telecommunications or energy supply.

Another key contribution of behavioural economics is the idea that these deviations are systematic. Applied to consumer behaviour in markets, it is possible to identify factors that can distort behaviour[43]:

- **Non-tangible and abstract goods**, such as financial products, may more easily lead to consumer errors. For instance, there is extensive literature demonstrating how cognitive biases influence decision-making regarding uncertain outcomes involving probability calculations.
- **Information-heavy and complex products** require processing a larger amount of information. This increases the likelihood of biases related to information structure, such as framing, salience, or anchoring effects, to occur.
- **Goods involving costs or gains deferred over time** may be affected by biases related to time preferences, such as overoptimism or hyperbolic discounting. Additionally, in these cases, the payments and rewards are often more uncertain.
- **Experience goods** can be influenced by cognitive biases linked to information, social norms, or trust.
- **Infrequently purchased goods or goods with non- repeat purchasing**. In markets where purchasing decisions are infrequent, it is more difficult for individuals to learn from their own experience. Furthermore, in some markets, the absence of repeated purchases is combined with high impact decisions, meaning their economic value is significant (e.g., pension plan contributions), which makes the cost of making mistakes higher.

Supply-side biases are also possible. In principle, one might assume that firms' decisions are, on average, more "rational" than those of consumers, because their resources and incentives to do so are greater (Armstrong and Huck, 2010; Fletcher, 2023). Firms can benefit from economies of scale in decision-making and interact in markets more frequently than consumers, giving them more opportunities to learn from experience. Furthermore, firms compete with one another, so that market dynamics can marginalise less effective decision-makers and lead to more efficient market functioning.

However, biased behaviour can also occur (Armstrong and Huck, 2010; Fletcher, 2023). Thus, companies operate in complex and dynamic environments. Moreover, in many cases they must consider strategic interactions with their competitors, which increases the cost and difficulty of making good decisions. Furthermore, companies are organisations made up of groups of individuals. In

[43] This classification is based on Oxera (2013), which analyses the particular case of financial services markets for retail clients.

this sense, collective decision-making processes can face specific problems and foster the emergence of certain biases[44].

Finally, individuals managing companies may also be affected by cognitive limitations and may exhibit certain personality traits to a greater or lesser extent than the general population. For example, business managers, on average, may be more inclined to overconfidence. For instance, overconfidence is often seen as one of the main causes of some market phenomena, such as the high failure rates of start-ups or the relatively poor performance of companies following mergers. (Malmendier and Tate, 2015).

4.1.2. Implications for how markets operate

Since biases are systematic, they can have significant implications for the overall functioning of markets. From a theoretical standpoint, the term "behavioural industrial organisation theory" is sometimes used to describe the body of literature related to this subject.

Most contributions suggest that consumers' cognitive biases **diminish effective competition and market efficiency**. In this context, it is reasonable to assume that most markets feature an asymmetry between firms and consumers: firms generally have stronger economic incentives, possess more resources, interact with the market more frequently, and are usually the ones setting the commercial terms offers (Spiegler, 2006). Therefore, if consumers do not make their decisions optimally, we can expect that firms will find ways to exploit this to their own benefit.

Some consumer biases may have the effect of reducing the sensitivity of demand to the conditions offered by companies, especially prices, thereby reducing effective competition among firms. Empirical evidence indicates that, in many markets, consumers display a high level of inertia, meaning they do not alter their purchasing decisions despite the availability of advantageous opportunities. Consumer inertia is not incompatible with rational consumer behaviour and can be explained by the existence of switching costs or search costs linked to changing suppliers, or by the diversity of individual preferences in markets with differentiated products. However, studies attempting to evaluate the monetary value of the frictions needed to account for observed consumer behaviour often estimate very high amounts[45]. In this sense, consumer inertia can also be

[44] Examples can be found in Fletcher (2023): herd behaviour (following others without thinking too much), free riding problems (“social loafing”), and additional complexity of the decision process itself (which can lead to outcomes such as a bias in favour of simpler options over more complex ones).

[45] For example, Scherbakov (2016) estimates switching costs in the US pay-tv market at more than half the annual cost of the service. Shum (2004), in a study on brand loyalty in markets with differentiated products, estimates implicit switching costs in the US breakfast cereal

explained as a result of cognitive biases, such as the *statu quo bias*, loss aversion, or the endowment effect[46].

Consumers' cognitive biases can also act as a barrier to the entry and expansion of new competitors in some cases (Fletcher, 2023). Therefore, in some markets, consumers may form trust-based relationships with established firms, which puts new entrants at a competitive disadvantage or discourages the development of innovative products. In such cases, regulation can help improve market efficiency by lowering the effort consumers need to spend to gather information or switch providers (Heidhues, Johnen, & Koszegi, 2021).

Conversely, established companies in one market may also leverage that position in related markets. While it is normal for companies to have easier access to their own customers than their competitors to offer them different products, the existence of cognitive biases (such as the *statu quo bias* or the prominence bias) can cause these types of advantages to translate into a significant decrease in market competition.

Cognitive biases can also contribute to reducing the contestability of markets characterised by the existence of network effects, such as in presence of multi-sided platforms, which are relatively common in digital markets. In these cases, some authors suggest that factors like inertia or herd effects can make competition for the market more difficult and contribute to consolidating the market power of established companies, even if there are no significant obstacles to switching providers (Fletcher, 2023).

Some mechanisms can help mitigate these adverse effects on efficiency and competition. For example, in markets where repeated purchases occur, consumers may learn from their past experiences, iteratively improving their decision-making process[47].

On the other hand, deviations from perfectly rational behaviour do not always have to result in reduced efficiency or competition. Sometimes, these implications may consist of an alteration in the conditions of competition between firms, without necessarily having adverse effects from a social welfare perspective. For example, in many consumer retail sectors, firm pricing patterns consisting of stable, high base prices combined with relatively frequent sales are observed,

market at amounts greater than the product price. Furthermore, the author finds evidence that advertising is very effective in increasing the likelihood of brand switching.

46 For example, Kiss (2014) studies the Hungarian car insurance market, attempting to separate the impact of switching costs and inattention on consumer inertia, estimating that inattention is the leading cause of inertia in the market.

47 For example, Agarwal et al. (2013) analyse a database of credit card usage patterns in the US. The authors find evidence that in that market knowledge acquisition effects dominate knowledge depreciation effects, meaning that consumers manage to reduce their bank fees over time.

which is consistent with firms' optimising behaviour in the presence of loss-averse consumers (Heidhues and Koszegi, 2014).

Consumers' bounded rationality can have other relevant implications. In behavioural industrial organization literature, it is common to assume **consumer heterogeneity**, meaning not all are equally susceptible to cognitive biases. Specifically, a common assumption is that some consumers are "naive" and act completely myopically, while others are "sophisticated" and behave perfectly rationally. In certain cases, the presence of sophisticated consumers can lessen firms' incentives to exploit the biases of naive consumers[48], allowing them to discipline the functioning of the entire market. However, cross-subsidies between consumers can also occur: individuals who behave rationally secure better deals and competition between firms tends to benefit them, while myopic individuals become worse-off. An example of discrimination based on consumers' cognitive biases might be the so-called "loyalty penalties". These are observed in some markets where consumers purchase services through long-term or open-ended contracts, with those who do not switch providers for extended periods often ending up with significantly worse contractual conditions than recent switchers[49].

Finally, although most theoretical and empirical contributions suggest otherwise, there are situations in which consumers' cognitive biases can have the effect of increasing effective competition or increasing market efficiency. The possibility that, in certain specific cases, consumers can exert compensatory market power over supply and influence firms' behaviour is sometimes mentioned (OECD, 2022a; Oxera, 2013). Thus, if consumers' decisions are influenced by their subjective perceptions of fairness, they may react disproportionately to firms' commercial practices considered unfair or abusive, limiting their ability to leverage their market power, even if this is not the optimal response from an economic perspective rationality.

4.1.3. Dark patterns

A concept that has gained popularity in recent years is that of "**dark patterns**". It refers to business practices that exploit consumers' limitations and cognitive biases with the aim of influencing, manipulating, or coercing them into making

48 In Gabaix and Laibson's seminal model (2006) price obfuscation is only profitable for firms if the proportion of sophisticated consumers is sufficiently small. One implication is that measures aimed at increasing the number of consumers who behave in a "sophisticated" manner (e.g., by increasing the transparency or comparability of information presented by firms) can reduce the attractiveness of manipulative strategies for firms.

49 For a discussion of loyalty penalties based on behavioural considerations, see E.CA Economics (2020). The report was prepared on behalf of the UK Competition Authority following a 2018 investigation into loyalty penalties in the mobile phone, broadband, savings account, insurance, and mortgage markets.

decisions they would not have made otherwise and that are not necessarily aligned with their own interests. While this type of behaviour can occur in any sector of activity, dark patterns are most commonly associated with digital markets[50]. This is because digital environments have several characteristics that make them particularly prone to the development of these practices (BIT, 2019b; CMA, 2022; OECD, 2022b)[51], including:

1. The ease of introducing changes to interface architecture and evaluating their effects on user behaviour.
2. The ease of generating and processing large amounts of information about individual behaviour.
3. The economic structure of the activity, characterised in many cases by large economies of scale, favours the emergence of concentrated markets on a global scale and allows for reaching a large number of users.
4. The existence of differences in individual behaviour in digital environments compared to physical environments which, in general, tend to make us more prone to cognitive biases and decision-making errors. Thus, various studies suggest that interactions with digital platforms can affect cognitive processes related to attention, memory, or social relationships, causing us to act more quickly, pay less attention, or trust recommendations from strangers (e.g., Firth et al., 2019), or that, in some cases, the cognitive effort required to process information is greater, for example when it is consumed through mobile devices (Amazeen, 2021).

Box 28. Recent regulation of digital markets in the European Union

Digital markets are increasingly important in the economy and pose significant challenges for competition policy due to their structural characteristics, which include substantial economies of scale and scope, significant network effects, and the importance of data as a key input for business (European Commission, 2019). All of this favours the emergence of large, dominant players with a global footprint and technological ecosystems that offer consumers a suite of services in a single location, which can weaken market competition and strengthen the position of incumbents.

The characteristics of digital markets also favour the development of business practices aimed at exploiting consumers' cognitive biases to extract greater rents or hinder competition. In this

50 In fact, the term was coined in 2010 by Harry Brignull, a user experience (UX) designer who identified and classified various strategies commonly used in digital interface design to get users to take actions they had not initially intended to. Brignull launched a project to collect and disseminate information related to dark patterns and the public authorities' responses to them (available at the following link).

51 The European Consumer Organization (*Bureau Européen des Unions de Consommateurs*, BEUC) has proposed (BEUC, 2021) the term “digital asymmetry” to refer to the power imbalances that exist between businesses and consumers specifically in digital markets, with the aim of proposing a review of consumer protection policy at EU level.

regard, in recent years a regulatory effort has been made at the European Union level to respond to these risks, including a review of horizontal consumer protection legislation and the approval of regulations governing specific sectors, specific uses, business structures (platforms), or affecting only specific operators (Busch and Fletcher, 2024). The main initiatives are summarised below.

1. At a horizontal level, the basic Community rules on consumer protection are the **Consumer Rights Directive** (Directive 2011/83/EU), the **Unfair Commercial Practices Directive** (Directive 2005/29/EC) and the **Unfair Terms in Consumer Contracts Directive** (Directive 93/13/EC).

   The Consumer Rights Directive is frequently recognised as an early example of applying behavioural economics to regulation, as it bans the use of default checkboxes for extra payments in contracts (Article 22).

   The Unfair Commercial Practices Directive, as a principles-based regulation, can encompass practices that emerged after its adoption, (although it also contains an Annex I that bans specific conducts). In 2021, the European Commission issued an Guidance on the interpretation and application of Directive (2021/C 526/01) that includes a section specifically dedicated to dark patterns, with examples of their application.

   More recently, the Commission published the findings of its *Digital Fairness Fitness Check*, an evaluation exercise of consumer protection-related regulations aimed at assessing whether they are suitable to address the specific challenges posed by digital markets. The evaluation concludes that further measures are required to tackle dark patterns.

   One issue that has gained importance following insights from behavioural economics has been the interpretation of the "**average consumer**" and "**vulnerable consumer**" criteria contained in the Unfair Commercial Practices Directive (Articles 5(2)(b) and 5(3)). The debate arises because behavioural economics suggests that vulnerability does not necessarily have to be an inherent trait of certain groups of consumers (e.g., children) but can also be shaped by contextual and situational factors that affect individuals' decision-making ability on certain occasions. In this context, international competition and consumer authorities, such as the United Kingdom's CMA (2019) and the Australian ACCC (2021) have warned that specific business strategies can exacerbate consumer vulnerability.

2. The **Digital Services Act** (Regulation (EU) 2022/2065), DSA, applies solely to providers of certain digital services and aims to ensure adequate consumer protection and the proper functioning of the internal market. It explicitly references dark patterns in its preamble (Recital 67) and, in its Art. 25(1), prohibits online platform providers from designing, organising, or operating their online interfaces "*in a way that deceives or manipulates the recipients of their service or in a way that otherwise materially distorts or impairs the ability of the recipients of their service to make free and informed decisions*".

   It also contains specific provisions aimed at very large online platforms (VLOPs) and very large online search engines (VLOSEs), including the obligation to assess systemic risks that may arise from the design or operation of their services, and to adopt measures to mitigate such risks.

3. The **Digital Markets Act** (Regulation (EU) 2022/1925), DMA, is an example of regulatory design based partly on previous antitrust cases. Its main aim is to promote fairness and contestability in digital markets, particularly in platform services offered by companies with established market positions, commonly referred to as "gatekeepers". Although most of its provisions regulate relationships between platforms and their corporate clients, it also includes clauses related to relationships with end users.

Thus, Arts. 5(2) and 6(3) oblige end-users to be given active choice options regarding the processing of personal data or the use of browsers and search engines. Several arts. (6(3), 6(4), 6(6), 6(9), 6(13)) stipulate that users must be able to make specific choices (such as changing default settings, installing and uninstalling software, etc.) in a simple manner and without unnecessary difficulty. Art. 6(5) prohibits gatekeepers from favouring their own products in ranking, indexing, or tracking functions of their platform. Finally, Art. 13 includes a closing provision that forbids gatekeepers from circumventing their obligations by "*offering choices to the end-user in a non-neutral manner, or by subverting end users' or business users' autonomy, decision-making, or free choice via the structure, design, function or manner of operation of a user interface or a part thereof*".

4. The **Data Regulation** (Regulation (EU) 2023/2854). The Data Act contains rules concerning the use and access of data across various sectors. Among other provisions, it aims to protect consumers from dark patterns when managing their personal information. Specifically, Sections 4(4) and 6(2) stipulate that data owners and third parties (as defined in the regulation) must design their digital interfaces to enable users to effectively exercise their rights choices.
5. The **Artificial Intelligence Regulation** (Regulation (EU) 2024/1689). The AI Act aims to regulate the use of AI systems to reduce their risks. Among the prohibited practices, Article 5(1) prohibits using AI systems that employ subliminal, deliberately manipulative, or deceptive techniques with the intention or effect of significantly altering the behaviour of individuals or groups in a way that harms their interests.

A key issue is the distinction between dark patterns or other potentially abusive practices, and legitimate persuasion strategies used by companies. Companies' efforts to attract customers and appealingly present their products can have pro-competitive effects. Therefore, it is essential to differentiate between practices that can enhance market functioning and behaviours that may distort competition, impair market efficiency, or harm consumers by manipulating their decisions[52]. There is an ongoing debate on the issue[53].

Regarding dark pattern classes, various classifications have been proposed[54]. For illustrative purposes, the following table describes some of the most relevant

[52] In this regard, international competition and consumer protection authorities such as the UK CMA (2022) or the Netherlands ACM (2020) have adopted the neutral expression of "*online choice architecture*" to more generally address the analysis of this type of practices, including elements that do not necessarily have negative consequences on the functioning of markets or that can even be used by authorities to design remedies or other types of pro-competitive interventions.

[53] The OECD (2022b) notes that companies have consistently used marketing techniques that exploit consumers' cognitive biases and systematically influence their decisions, such as the use of psychological pricing (e.g., setting the price of a product at 9.99 instead of 10) or placing products with higher margins in strategic positions in supermarkets (e.g., at eye level), which supervisory authorities have often tolerated.

[54] This is a complex exercise, partly due to its heterogeneity and the emergence of new practices as a result of innovation and the emergence of new forms of interaction between consumers and businesses. The European Commission (2022) proposes a classification with two axes based on the element of the choice architecture affected (information on the

ones, following the classification proposed by CMA (2022), which groups them based on whether they influence the choice structure, information structure, or the decision pressure.

Table 9. Dark pattern classes

Choice structure	
Defaults	When there are several possible alternatives, one of them is selected by default.
Deceptive visual prominence	Some options are highlighted above the others (for example, they are placed at the top of a list or presented in a different format), depending on the designer's interests.
Obstruction	Barriers or obstacles are created that make it difficult to perform a particular action (such as cancelling a subscription or user account) or access certain information.
Forced action (*bundling*)	When the user tries to perform an action, they are forced to perform another action they did not want (for example, providing personal information or payment details).
Choice overload	Too many options are offered for comparison and/or a decoy option is added to make the other options seem more attractive by comparison.
Information structure	
Drip pricing	Initially, a portion of the total price of a good is shown, and additional charges are added as the purchasing process progresses.
Reference pricing	The price of a good is shown along with a less attractive reference price (for example, a price before sales or a future price).
Complex information or language	Information is presented in an unnecessarily complex manner, making it difficult to compare products or understand the conditions of an action or product.
Information overload	Too much information is presented, making it more difficult for the user to access the most relevant information to make the decision.
Hidden information	Some relevant information is presented in a hidden or disguised manner, for example through visual elements (such as smaller font size or lower contrast).
Sneaking	The presentation of relevant information is delayed or shown in a confusing manner with the goal of getting the user to perform an action or transaction without their consent (for example, a subscription to a service is included during the checkout process for another product).
Covert advertising	Advertising is displayed in such a way that it is difficult to differentiate from the actual content of a platform or service (for example, using the same visual elements as the rest of the interface).

attributes of the offer, information on costs, or the structure of the choice) and the way in which they affect decisions (whether they influence preferences or the cognitive resources needed to make a choice). Leiser and Yang (2023) propose a classification of dark patterns based on the structure of the Unfair Commercial Practices Directive (Directive 2005/29/EC).

Choice pressure	
Deceptive scarcity	A false sense of scarcity is created to encourage impulse buying, for example through misleading indications of high popularity or limited stock.
Deceptive urgency	The user is tricked into believing that they have little time to make a decision, for example through a fake countdown.
Deceptive social proof	The user is tricked into believing that a product is very popular or of high quality, for example, through fake ratings or reviews.
Nagging	The user is interrupted or pressured to perform a specific action, for example, through pop-up windows.
Confirmshaming	The user is emotionally manipulated (for example, by trying to make them feel ashamed or remorseful) in case they want to take a certain action, such as unsubscribe from a service.

Source: based on CMA (2022).

In practice, the available evidence suggests that dark patterns in digital environments are widespread. For example, Di Geronimo et al. (2020) analysed 240 popular mobile apps in the US, finding some form of dark pattern in 95% of them. In the EU, the European Commission (2022) analysed the 45 most popular websites and 30 mobile apps, finding dark patterns in 97% of them[55]. The results indicate that it is common for platforms to employ several of these practices simultaneously, and that many of them are difficult for users to recognise. Some of the most frequently used techniques include default options, manipulating or hiding information, *nagging*, making cancellation difficult, or forcing registration. The widespread use of dark patterns can also diminish consumer trust in markets, affect the credibility of all companies—including those that act honestly—and undermine the principles of merit-based competition (Mathur, Mayer, & Kshirsagar, 2021).

Regarding specific practices, analyses of how different dark patterns influence consumer behaviour often yield mixed results and moderate effects (European Commission, 2022; OECD, 2022b), similar to the literature on nudges. However, some particular dark patterns seem notably effective, such as default options[56] or practices related to drip pricing[57] or information manipulation in general (e.g.

55 Further analysis on this subject can be found at OECD (2022b).

56 Jachimowicz et al. (2019) conducted a meta-analysis of 58 publications related to default options, finding consistent evidence of their impact on behaviour, which also tends to be significantly greater than that of other *nudge- based interventions* . In decisions between two alternatives, preselecting one of them increases the probability of its selection by 27% on average.

57 Blake and Moshary (2021) conducted a large-scale field experiment on a US ticket resale platform, finding that consumers were willing to pay 20% more when drip pricing techniques were used *compared* to a transparent display of the full price upfront. Duke et al. (2013)

European Commission, 2022; Luguri and Strahilevitz, 2021). One factor that complicates assessing the effects of individual dark patterns is that they are often employed together. In this context, Luguri and Strahilevitz (2021)[58] find evidence suggesting that their use can be cumulative when several are employed simultaneously. Furthermore, various studies indicate that the effectiveness of dark patterns varies among individuals and that they are generally more successful on more vulnerable consumers (e.g., European Commission, 2022; Meyer et al., 2019; Luguri and Strahilevitz, 2021), such as children, the elderly, or individuals with lower educational attainment. Finally, some studies suggest that dark patterns remain effective even if users are aware that they are being used, although more aggressive strategies may provoke greater reactance from consumers (Bongard-Blanchy et al., 2021; European Commission, 2022; Luguri and Strahilevitz, 2021).

A growing concern regarding the use of dark patterns by companies is the potential for customisation of practices. The vast amount of information available on consumer behaviour, especially in digital environments, combined with the development and increasing accessibility of analytical tools, makes it easier for companies to identify and exploit individual user characteristics, including their cognitive biases, through individually tailored offers[59] or choice architecture designs. Personalisation of offers is not necessarily negative. It can have positive effects on competition and market functioning, such as reducing consumers' search costs or creating products better suited to individual needs. However, it also presents significant risks, as companies may exploit the specific vulnerabilities of individual consumers. Its prevalence might increase in the future due to greater availability of personal information, easier access to artificial intelligence tools, or market competition dynamics, which could reward companies that make more effective use of such instruments. (European Commission, 2022; OECD, 2022b; Willis, 2020).

conducted experimental work to analyse the impact of various pricing strategies, finding evidence that drip pricing, complex pricing, *bait pricing* (displaying an upfront amount that does not correspond to the actual price that will be paid, e.g., "starting from"), and limited-time offers all distort consumer behaviour. A general discussion of drip pricing policies can be found in Greenleaf et al (2016).

58 The authors conducted two large-scale experiments in the United States to study the potential of dark patterns to modify individual behaviour and to identify the most effective practices. In one experiment, under the most aggressive application of dark patterns, they succeeded in persuading 42% of individuals to voluntarily participate in a program designed to combat identity theft, compared to 11% of individuals in the control group.

59 Yeung (2017) refers to "*hypernudging*" as the design of highly personalised decision-making environments based on algorithmic or artificial intelligence tools.

4.2. Competition applications

The information presented throughout this study highlights the importance of competition authorities being aware of and considering the contributions of behavioural economics.

4.2.1. Definition of the relevant market

In markets where cognitive biases significantly influence demand behaviour, competition authorities' decisions in some cases may indicate that the relevant markets could be narrower or broader than what an analysis assuming perfect rationality would suggest.

For instance, in the 2018 Google Android case (AT.40099), in which potential abusive conducts were investigated, the European Commission adopted a narrow market definition, considering Google to be a monopolist in the market for *app stores* for Android devices, rather than a duopolist in the broader market for mobile *app stores* . It did so partly based on the conclusion that competition between operating system (OS) providers was too weak to have a significant impact on the secondary market, particularly due to a high degree of consumer inertia (Fletcher, 2023).

Likewise, in some cases, it may be possible for companies to employ discrimination strategies based on differences in the behavioural biases of different consumer categories. This could sometimes lead to situations in which companies compete for "sophisticated" consumers, who benefit from advantageous conditions, while imposing unfavourable conditions on "naive" consumers. In certain circumstances, it may be considered whether this constitutes the existence of differentiated markets.

4.2.2. Dominant position and market power

Dominance refers to the ability of firms to influence equilibrium conditions in a market unilaterally[60]. Behavioural economics highlights that factors such as inertia, limited attention, or difficulty processing complex information can prevent consumers from recognising the best products on the market or switching suppliers despite superior options. This can limit competition in markets, potentially influencing considerations of market power and dominance. Once

[60] According to its traditional definition, a dominant position is "a position of economic strength enjoyed by an undertaking which enables it to prevent effective competition being maintained on the relevant market, by giving it the power to behave on an appreciable extent independently of its competitors, customers and ultimately of its consumers" (ECJ, case 27/76).

again, this emphasises the importance of conducting a case-by-case analysis of markets based on evidence of how they behave operate.

4.2.3. Abusive conduct and possible restrictions on competition

The identification of abusive conduct is one area where behavioural economics has seen the greatest application in recent years. This issue can also be considered from the perspective of potential restrictions on competition that need to be taken into account in merger control matters. Behavioural economics can help understand why certain corporate conducts may have negative consequences for consumers or the functioning of markets.

One category of conduct that can have exclusionary effects in certain situations is sales tying and bundling, where a company sells multiple products together. The risk is that a company with a dominant position in one market exploits its power to gain an undue competitive advantage in other markets. Behavioural economics suggests that the use of behavioural instruments could, in some cases, lead to exclusionary practices that violate competition law.

A notable case was that of Microsoft's Media Player (C OMP/C-3/37.792), in which the European Commission investigated abusive conduct involving the pre-installation of Microsoft's Media Player on all computers running the Windows operating system from the aforementioned company. Although it was relatively easy for users to download any other media player free of charge, the Commission considered that the pre-installation of Media Player (a default option) had a sufficiently strong effect on consumer choices to make it significantly more difficult for competitors to enter the media player market, and that the practice therefore constituted an abuse of a dominant position.

More recently, the Commission investigated similar conduct in the 2018 Google Android case (AT.40099). In this case, the investigation focused on Google's practice of making the installation of its Google Play app store on Android devices conditional on the pre-installation of other Google services, such as its search engine or web browser. Once again, the pre-installation of related services acted as a default option, and users were free to download any competing service at no charge. However, during the investigation, the Commission examined internal Google documentation highlighting how default options influence user behaviour. It also reviewed evidence indicating that most mobile device users rely on the services pre-installed on their devices, regardless of the services[61]. The Commission therefore concluded that the pre-installation of Google services on

[61] The Commission compared market share on devices with its pre-installed services with their share on other devices, finding significant differences. In fact, during the investigation of the case, it was also noted that some competitors were attempting to reach pre-installation agreements similar to Google's with mobile device manufacturers.

mobile devices significantly hindered market entry by competing service providers.

In the 2017 Google Shopping case (AT.39740), the conduct investigated involved the manipulation of information to make Google's own services more visible, exploiting saliency bias. Specifically, the practice included ranking the price comparison website Google Shopping highly in Google's search results, while simultaneously relegating and making the search results of competing product comparison websites less appealing (a form of self-preferencing). In this case, too, there was no significant obstacle preventing the use of competing services, but in practice, consumers disproportionately focused on the most prominent information, regardless of its content. In reaching this conclusion, the Commission relied on an empirical analysis that examined consumers' responses to changes in the ranking of search results[62].

Another similar example is the Amazon Buy Box case (AT.40703), which investigated conduct that conditioned access to a prominent position (the "Buy Box") in Amazon's search results based on sellers' use of Amazon's logistics services. In assessing the abusive nature of this behaviour, the European Commission considered the importance of sellers' sales visibility on the platform.

Finally, in Spain, the Booking case (S/0005/21) can also be cited, in which abusive conduct was investigated consisting of conditioning access to top positions in search engine results to compliance with certain requirements that restricted hotels from advertising on alternative platforms, thereby limiting their ability to compete with Booking (exclusionary effects). Additionally, exploitative conduct concerning the conditions imposed by Booking on hotels to participate in specific programmes intended to enhance their search result ranking was examined[63].

Insights from behavioural economics advise also a greater focus on exploitative abuses, especially given the increasing significance of potential abuses in

62 Specifically, a difference-in-differences analysis was conducted to compare user behaviour before and after the introduction of the featured checkbox for the Google Shopping service, finding evidence of a significant shift in traffic away from rival comparison sites after its introduction. An A/B test was also conducted to compare versions of search results with and without the featured checkbox for Google Shopping, finding evidence of significantly lower traffic to competing services when the Google service was prominently displayed. Finally, the possibility was raised that individuals click on the first search results because they are the most relevant and closely match their preferences. To test this, an experiment was conducted in which randomly ordered results were displayed, confirming that the likelihood of clicking on a result increases with its prominence, regardless of its content.

63 In particular, the CNMC considered (accredited facts 5.8 and 5.9) the importance of the order in which search results are presented on consumer behaviour and, consequently, on bookings for a particular hotel. To this end, the CNMC relied on evidence linking search results ranking to the number of bookings, including an academic publication by Booking's IT engineers in which they referred to this relationship as "position bias".

variables beyond price. One example is the area of privacy and clauses relating to the transfer and access to personal information, which are often accepted by consumers through terms and conditions that are opaque and/or clearly designed to bias consumer understanding decisions. For example, the German competition authority imposed obligations on Facebook in 2019 following an investigation into its policies regarding the collection and processing of personal information. Specifically, Facebook was able to collect personal information from the company's various applications (such as Facebook, WhatsApp, and Instagram, among others) and third-party websites, and combine it to create a single user profile, without proper information and without the express consent of users of its services, contrary to the provisions of the General Data Protection Regulation (Regulation (EU) 2016/679)[64]. Similarly, in 2023 the German competition authority accepted commitments from Google in an investigation into its terms of use of personal information of its service users. One of the aspects investigated was the design of Google's privacy clauses, which had the effect of biasing users' consent choices[65].

Finally, a related issue to the contribution of behavioural economics to the identification of abusive practices may be its implications for the private enforcement of competition law, particularly through private actions seeking damages before ordinary courts[66]. In this regard, behavioural economics can shed light on the estimation of compensable damage or the standard of proof required in these cases[67], which may be particularly relevant in situations where

64 The Italian competition authority also took action against Facebook in 2018 for similar practices, but this time as part of an investigation into violations of consumer protection laws (Facebook's policies were deemed to constitute aggressive and deceptive commercial practices).

65 In another recent case, an investigation coordinated by the European Commission within the framework of the Consumer Protection Cooperation Network concluded in 2025 that a set of e-commerce practices carried out by SHEIN violate EU consumer protection legislation. Many of the practices identified can be considered dark patterns, including the use of fake discounts, misleading urgency, and, in general, the concealment or presentation of information in a misleading manner with the aim of biasing consumer behaviour.

66 This type of action has gained increasing importance in the EU in recent years, especially following the entry into force of the so-called Damages Directive (Directive 2014/104/EU). These private actions can play a deterrent role, complementary to the actions of competition authorities, by increasing the cost of anticompetitive conduct. Measures aimed at facilitating their exercise (by reducing real or perceived barriers), such as the CNMC's Guide for quantifying harm from competition law infringements (G-2020-03), can thus have a disciplining effect on companies' behaviour.

67 For example, in a recent 2024 judgment (*Le Patourel v BT*), the UK Competition Appeal Tribunal (CAT) used behavioural evidence and arguments for the first time in a class action lawsuit against BT for setting unfair terms for inert consumers. Although the court ultimately dismissed the claim, the evidence included testimony from behavioural economics experts and the discussion focused on determining the degree of consumer inertia and the extent to which the lack of switching providers could be explained as the result of psychological friction or active choices by consumers satisfied with the service received.

the harm results from the exploitation of cognitive biases by operators, given that in these cases it may be more difficult for consumers to identify the harm or take action to claim it (Salinger, 2010).

4.2.4. Remedies, corrective measures and commitments

The design of remedies, commitments and corrective measures is an area where behavioural economics could have great potential. Specifically, it could contribute to the design of more effective and less market-distorting interventions, for example, through nudge-based interventions.

In recent years, competition authorities have tended to place greater emphasis on demand-side remedies, commitments, and corrective measures, often aimed at enhancing consumer information or capacity. Following Fletcher (2016), demand-side remedies can be categorised into four groups:

1. **Information disclosure obligations**: these may aim to provide consumers with information they lack due to asymmetric information problems or to encourage them to consider relevant information for their purchasing decisions. In markets where asymmetrical information exists, information disclosure obligations can help improve consumer choices[68].

   In this sense, behavioural economics can assist in designing more effective information disclosure requirements. Therefore, even when relevant information is accessible, consumers might ignore it or fail to use it properly due to reasons such as cognitive overload, limited attention, or inertia. Disclosure requirements might be informed by behavioural insights, for example, by establishing rules on how information is presented, making it

[68] For example, in 2014 the UK CMA conducted market research on the private healthcare services sector and found evidence that consumers are largely unaware of information relating to the quality of services received (such as indicators of treatment effectiveness or patient satisfaction). This incentivises hospitals to compete on variables that are more visible to users but have little relation to the quality of the core service (such as food or the appearance of the rooms). As a result of the research, the CMA required private hospitals to compile and publish a series of indicators related to service quality, to improve consumer decisions.

simpler[69], more accessible, or more prominent [70], or more easily comparable between operators[71]. Moreover, rules relating to the timing of access to information, for example, through reminders[72], may also sometimes help to increase the chances that it will be considered by consumers.

2. **Measures to promote product comparison**: while related to information disclosure obligations, measures specifically aimed at encouraging active comparisons of available offers can be distinguished. This type of remedy can be particularly effective in markets where there is a high level of demand inertia, product characteristics are complex and difficult to understand, or other factors make comparison especially challenging.

   This also includes measures that invite or directly require consumers to make a choice. An example is reminders or alerts (wake-up letters) that provide information on product characteristics, such as when there is a change in the terms of a service or when a long-term contract is nearing its end[73]. In recent years, active consumer choice obligations have also become popular, particularly in digital markets[74]. Finally, in markets where sales of related

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69 One sector where many efforts have been made to simplify information is the financial services sector, as these products are often complex and hard for consumers to understand properly evaluate. For example, in the US, the SEC (Securities Exchange Commission) has required investment funds since 2009 to prepare a 3-4 page "summary prospectus" with a series of key data, with the aim of making their characteristics easier for investors to understand. In the European Union, the 2008 Directive on credit agreements for consumers (Directive 2008/48/EC, repealed by Directive (EU) 2023/2225) required the inclusion of the annual percentage rate (APR) in commercial information related to consumer credit. This seeks to summarise the total cost of credit in a single indicator. This also facilitates product comparison.

70 For example, following a 2015 market investigation into the individual savings account market, the UK´s FCA introduced several requirements to present certain relevant information (such as interest rates) more prominently, including a requirement that complete product information on banks' websites be accessible with a single click.

71 In this regard, remedies can also be proposed that involve explicitly prohibiting the concealment of information or presenting it in an opaque manner, for example, in relation to price partitioning practices.

72 For example, in the US, the FCC (Federal Communications Commission) reached an agreement with mobile communications service providers in 2011 to send reminders to consumers when they are approaching the point of incurring additional charges for exceeding the usage limits included in their plans.

73 For example, following its 2015 market investigation into the personal savings account sector, the FCA required banks to send notifications to customers before interest rate changes came into effect. This intervention was supported by the results of an FCA-conducted RCT, which found that pre-switch reminders had a significantly greater impact on switching decisions than post-switch notifications.

74 An example was the agreement between Microsoft and the European Commission in 2009 to introduce an active choice screen for web browsers, as part of an investigation into abuse of dominant position related to Microsoft's practice of pre-installing its web browser on computers running its operating system. More recently, the Digital Markets Act (DMA,

goods occur (e.g., products accessory to a main good), active comparison can be encouraged through measures that limit the ability of operators to leverage the advantage they obtain in one market (e.g., because they are the point of sale of the main product) in the sale of other goods[75].

In general, these remedies can be effective in counteracting consumer inertia and promoting active comparison of offers[76].

3. **Measures to incentivise switching**: these generally aim to decrease the cost (actual or perceived) of switching suppliers. Interventions like this are especially important in markets where long-term relationships exist between companies and their customers. This category includes measures to remove contractual barriers to ending relationships, such as cancellation fees, notification periods, or long-term exclusivity clauses. In this context, behavioural economics shows that, even if there are no "hard" contractual conditions restricting switching, companies may try to exploit consumers' cognitive biases to achieve similar effects, for example, through lengthy termination periods or automatically renewed contracts that can only be cancelled within narrow time windows[77], or simply by making termination processes unnecessarily long, complicated, or costly[78].

   Measures that actively seek to facilitate the switching process by reducing costs or duration can also be mentioned[79]. Examples include measures

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Regulation (EU) 2022/1925) introduced active choice obligations in relation to web browsers and search engines in its Article 6(3).

75 One example is the point-of-sale marketing bans imposed by the UK competition authority in the payment protection insurance sector. Similarly, in 2015, the UK's FCA imposed a four-day moratorium on car dealers, during which they were prohibited from offering related insurance to buyers. Justifying the measure, the FCA noted that car insurance purchased separately had an average price about half that of insurance sold bundled with the vehicle.

76 According to the available evidence, the introduction of an active web browser choice screen in the case of Microsoft's web browser had a significant effect on encouraging competition in the sector (OECD, 2022a). A very similar bundling practice was investigated in the Media Player case (COMP/C-3/37.792). In that case, the European Commission simply forced Microsoft to offer a version of its operating system without Media Player. In response, Microsoft offered the version without Media Player at the same price as the version with Media Player, which resulted in residual demand for the former.

77 For example, in 2011 Ofcom (UK´s telecommunications regulator) banned automatic renewal clauses in fixed-line and broadband contracts for individual consumers and micro-businesses. It did so based on evidence suggesting a causal relationship between such clauses and lower switching rates.

78 Thus, in recent years, several countries have introduced regulations specifically aimed at preventing "subscription traps" in digital environments, with rules to ensure that the cancellation of goods and services can be done easily (click-to-cancel), for example, Argentina in 2020, Germany in 2021 or the USA in 2024.

79 For example, following a 2016 market inquiry into the energy sector, the CMA adopted a *database remedy*, whereby the data of consumers who do not change their contract within a

related to data portability[80]. Also, rules that allow the new supplier to manage the switching process on behalf of the consumer[81].

4. **Regulation of results**: finally, measures that mandate or prohibit certain practices by companies or establish rules governing their behaviour can also be mentioned. This category includes restrictions on the marketing or distribution channels of products, or limitations on the persons to whom certain products can be sold. Financial services are a sector where such rules are quite common, for example through restrictions on advertising or the sale of specific products to unqualified investors[82].

   In some cases, price discrimination practices may be prohibited or restricted to prevent undesirable distributional effects, or limitations may be imposed on the characteristics of goods. Finally, some form of price control might also be introduced. These measures generally tend to involve a greater level of interventionism.

To properly select and design behavioural interventions, it is essential to make an adequate evaluation of the measures on a case-by-case basis depending on the actual consumer behaviour. A notable initiative in this regard is the *Consumer Remedies Project* developed by the UK Competition Network (comprising the CMA and key sector regulators) with the aim of creating a knowledge base on the sources of demand-side market disruptions, available regulatory alternatives, and best practices for assessing their effectiveness.

three-year period is shared by default (unless expressly opted out) in a public database accessible to competitors or product comparison platforms. The aim of this measure was to mitigate the problem of inert consumers, who in many cases end up with contract terms significantly worse than those of the best available offer.

80 In the EU, for example, mobile phone number portability is mandatory when switching operators, according to the European Electronic Communications Code (Directive (EU) 2018/1972). Recently, the rules on data interoperability have been strengthened in the Data Act (Regulation (EU) 2023/2854) or the DMA (Regulation (EU) 2022/1925), which requires gatekeepers to offer mechanisms enabling free data portability upon request by users (Article 6(9)).

81 For example, in 2015, Ofcom introduced new regulations in the UK allowing broadband providers to complete all the necessary procedures for switching.

82 Mention may also be made of the rules that oblige financial institutions to conduct suitability assessments, which are generally the responsibility of the client. An example is the "MiFID tests", introduced by the MiFID Directive (Directive 2014/ 65/EU), which institutions must carry out for retail investors wishing to contract certain investment services.

5. CONCLUSIONS AND RECOMMENDATIONS

Behavioural economics shows that individual decisions are the result of complex cognitive processes. People generally rely on mental shortcuts or simple decision rules, known as heuristics, which sometimes cause consistent deviations from the predictions of a rational behaviour model. Therefore, cognitive, social, behavioural, and contextual factors significantly influence judgment and decision-making, especially in specific situations or contexts. Because of their systematic nature, cognitive biases can assist in analysing and predicting citizens' responses to various stimuli. As the activity of public authorities primarily aims to influence human behaviour, this conclusion has important implications for how authorities design and implement their policies.

This does not mean, however, that behavioural economics nullifies or replaces previous knowledge: cognitive biases do not play a decisive role in many relevant situations, individuals do respond to economic incentives, and conventional tools can be optimal in many cases. The contributions of behavioural economics help to complement and enrich the analysis of human behaviour, providing explanations for deviations from rational behaviour observed in some situations and aiding in the achievement of public interest objectives more efficiently and effectively. Moreover, the flexibility and low implementation costs of behavioural instruments make them highly effective. Therefore, they have considerable potential to complement or substitute other conventional instruments, such as economic incentives, obligations, or prohibitions.

Behavioural economics involves recognising the complexity of human behaviour and therefore faces a series of challenges and difficulties, particularly related to the replicability and scalability of interventions, which makes it difficult to develop generally applicable guidelines and measures. These challenges, far from discrediting behavioural economics, reinforce its commitment to a more scientific approach to economics, rejecting single, unchanging solutions and instead emphasising rigour and focus on the design of evidence-based interventions. For all these reasons, behavioural economics is a valuable experimental field for diagnosing, designing, and testing evidence-based interventions, rather than serving as a repository of singular, universally applicable solutions. Its application also offers considerable advantages over the alternative of ignoring how the populations targeted by public policies actually make decisions.

Therefore, **it is essential that public administrations understand these contributions and incorporate them into the public policymaking process at all its stages**. Experience in various countries and international institutions demonstrates that the integration of behavioural economics effectively helps improve decision-making and the effectiveness of public policies. On the other hand, other actors, particularly businesses, can also use their understanding of individual behaviour to pursue their own goals, which may not necessarily align

with the broader public interest. Therefore, it is equally important to **incorporate behavioural economics into market supervision to ensure the competitive and efficient functioning of the economy**.

In Spain, public policies, regulations, and interventions are generally not designed with the insights of behavioural economics in mind. The lack of awareness and the absence of widespread or systematic application leave considerable room for improvement and create a gap compared to major international economies.

Adopting a behavioural approach systematically could enhance the efficiency and effectiveness of regulations and public policies in many areas, supporting the achievement of public objectives without restricting citizens' options, avoiding more restrictive measures, and reducing costs to the public budget. This would help uphold the principles of proportionality, efficiency, and effectiveness more effectively regulation. Understanding the tools and principles of behavioural economics also enables improved supervision of markets and the behaviour of private operators, facilitating the identification of risks and issues related to how private entities use these instruments for their own interests.

Considering the above and the analysis conducted in this study, several opportunities for improvement have been identified for public administration in Spain.

Therefore, the **following recommendations are proposed**:

FIRST. CREATE AN INSTITUTIONAL FRAMEWORK FOR BEHAVIOURAL ECONOMICS

I. Establish behavioural economics units

International experience shows that the systematic adoption of behavioural tools by public administrations needs a specific institutional framework. This usually involves creating units dedicated to behavioural science (nudge units), which support the development of standard methods and procedures, systematic analysis, and the progressive build-up of knowledge and experience. They also help to clearly define specific roles and objectives. The first step towards a consistent and systematic use of these tools in Spain should therefore be establishing an institutional framework that moves beyond the fragmented and ad hoc approaches that have been used so far.

Therefore, it is **advisable to establish behavioural economics units** within the Spanish public administration to encourage the systematic integration of behavioural insights. Internationally, various models can serve as references. Notably, the level of centralisation of these units differs by country; they can be a single unit for the entire administration, departmental units, or adopt mixed

models. The selection of a particular structure depends on multiple factors, including political, technical, resource availability, approach, and functions.

To promote its development, it might be advantageous to start by establishing a specialised unit in Spain within the General State Administration to act as a reference nudge unit. This unit could encourage the gradual adoption of these tools in the administration. It could thus offer behavioural support to administrations in general, including those with fewer resources, and undertake advisory functions, issuing reports on regulation or policies upon request from the public sector. Furthermore, it could proactively prepare reports with recommendations for improvement from a behavioural perspective. Similarly, a mixed or decentralised model might be preferred if, after a thorough assessment of the various options, it is considered more appropriate.

Moreover, the Spanish public administration currently has few profiles with specialised training in behavioural economics. This reinforces the idea of establishing a dedicated unit that, even with limited resources initially (which is common: more than 50% of nudge units operate with fewer than four people (OECD, 2024a)), could provide options such as training staff, utilising external expertise, or forming strategic partnerships with academia and international organisations networks.

II. Establish a network of behavioural experts within public administrations

The existence of networks of behavioural economics experts within public administrations can be highly important for establishing a collaborative policy that promotes the sharing of knowledge and experiences while maximising synergies. This network could be particularly valuable for promoting best practices and success stories, speeding up the adoption of improvements through shared learning.

Therefore, it is recommended to **establish a network of behavioural economics experts within the Spanish public administration**, with mechanisms for exchanging experiences and best practices. The arrangement and structure of this network would be aligned with the institutional framework adopted in Spain, if any, and could help coordinate actions in this area conducted by different administrative levels. Administrations with fewer resources (usually those closest to citizens, such as local authorities) could particularly benefit from the network of experts by providing them with a stable channel for knowledge transfer and technical support.

III. Enhancing the human capital of public administrations in behavioural economics

To ensure the systematic and appropriate use of behavioural economics tools, it is crucial that decision-makers and public employees involved in designing, implementing, and evaluating regulations and public policies are familiar with these tools. The most advanced countries in adopting the behavioural approach have established training and knowledge-sharing plans and tools. International institutions also provide courses and forums to enhance knowledge in this area. However, in Spain, training in behavioural economics has yet to be systematically integrated into the public sector. Generally, there are no specific requirements or clear pathways for specialisation in this field. The scarcity of professionals with specialised training in behavioural economics hampers the application of this approach in the public sector.

Therefore**,** it is advisable **to strengthen the human capital of public administrations in behavioural economics**. To achieve this, specific training plans and courses could be proposed, focusing on different functions and levels of responsibility. Behavioural economics units, if established, could play a key role in designing and delivering this training, supporting the implementation of the programme in collaboration with agencies responsible for training public employees. Similarly, it would be beneficial to incorporate thematic modules of behavioural economics into the access, selection, and promotion processes for public employees, especially in bodies involved in designing regulations and public policies. Public administrations could also consider collaborating with experts in the field to enhance technical and training capacities, as well as establishing structural or specialised partnerships with academics and specialists in behavioural economics.

IV. Participation in international forums on behavioural economics and the adoption of best practices

The international exchange of experiences is essential for promoting collaboration on projects that may interest different countries, gaining access to innovative and high-quality resources, and identifying interventions that have proven effective elsewhere. These platforms thus encourage mutual and continuous learning among administrations. However, the Spanish administration does not currently participate widely and systematically in such forums, possibly due to the absence of a dedicated institutional framework.

These forums offer access to international best practices, making their adoption easier. Additionally, various documents and methodologies recommended by leading institutions, such as the OECD, point to numerous useful practices for establishing behavioural units and integrating behavioural science into public policies and regulations.

Given the potential benefits of international cooperation, **it is recommended that the Spanish public administration actively participate in behavioural economics forums and adopt internationally available best practices**. Among others, it could join working groups such as OECD's BRAIN -Behavioural Research in Action International Network- and its related groups on sludge reduction, behavioural public administrations, environmental policies, competition, and artificial intelligence.

SECOND. INCORPORATE BEHAVIOURAL ECONOMICS IN REGULATION AND PUBLIC POLICIES

V. Integrating behavioural economics into regulatory and public policy design processes

Behavioural economics tools can be very useful in various contexts to enhance the quality of regulations and public policies, usually at a low cost. Furthermore, given their high flexibility, they can be effectively integrated into a wide range of interventions and areas of action. Its context-dependency highlights the importance of having procedures and guidelines for policy and regulatory design that enable the assessment of all available options and the selection of the most suitable one.

Consequently, **it is recommended that behavioural economics be systematically and rigorously integrated into regulatory and public policy design processes** to implement the most effective, efficient, and proportionate measures, considering the context and actual behaviour of the recipients.

This approach aligns with the principles of efficient and smart regulation. Among the methodological tools for verifying compliance, the regulatory impact analysis of draft regulations stands out as a key tool. In the case of the General State Administration, this is mainly reflected in the Regulatory Impact Assessment Report (MAIN), which has been mandatory since 2009. Explicitly including behavioural elements in this document could strengthen the effectiveness, efficiency, and proportionality of public sector regulations and interventions. It would also be advisable to consider whether behavioural economics units, if established, should serve as advisory bodies on public sector regulations and actions, and thus be capable of issuing reports with behavioural recommendations. This could be complemented by proactive functions, such as preparing studies and analysing current policies and regulations to identify issues from a behavioural perspective and provide recommendations.

VI. Including behavioural assessment in regulations, procedures, and guides for public policy evaluation

The assessment of public regulations and policies is crucial in ensuring their effectiveness, efficiency, proportionality, and quality. Therefore, including behavioural criteria in the evaluation phase helps to better understand how the recipients of public policies will respond, enabling them to adjust their design and implementation, and thereby enhance their effectiveness.

In recent years, numerous measures have been adopted along these lines, both internationally and nationally, as well as at regional levels. Among these, Law 27/2022, of 20 December, on the Institutionalisation of the Evaluation of Public Policies in the General State Administration (LIEPP), stands out. This law aims to promote a culture of coherent, continuous, and systematic evaluation within the Administration. It provides for the establishment of Public Policy Evaluation Coordination Units in each ministerial department to oversee and coordinate the ministry's evaluation activities, also acting as a liaison with the State Agency for Public Policy Evaluation. This regulatory and institutional framework holds significant potential for integrating behavioural elements into policy evaluation processes. Furthermore, it would be advantageous to incorporate this approach into other public policy evaluation regulations across various administrative levels.

It is therefore recommended that an explicit incorporation of a behavioural approach be included in the evaluation of public regulations and policies. To this end, it would be beneficial for regulations, procedures, and institutions in this area to consider behavioural aspects systematically. It would also be advisable to update evaluation guides and methodologies, such as those developed by the IEPP, to include criteria and examples related to behavioural analysis. Integrating this perspective would enrich the analysis and contribute to an evaluation more tailored to the actual behaviour of individuals.

VII. Developing guidance and support tools for public administrations, such as guidelines, manuals, and self-assessment tools

The design and application of standards and public policies is a task that concerns public administrations of all kinds. It also involves a wide range of public employees with diverse functions and specialisations. To help them incorporate behavioural considerations into their work, many countries have published guidance and support materials aimed at public employees and administrations. These typically include guidelines, manuals, training portals, and self-assessment tools that promote knowledge of behavioural economics and support its application. This can facilitate the integration of behavioural economics into the design of public regulations and policies, especially by administrations with

fewer resources. In the case of Spain, such tools are currently lacking, so there is potential for further development.

Therefore, it is advisable to develop guidance and support tools on behavioural economics for public administrations to help integrate them into the design of regulations and public policies. This could include guides, frameworks, and self-assessment tools, among others. These resources could be made available online to improve accessibility for legislators and decision-makers across various public bodies. Additionally, if behavioural economics units are established, they could undertake outreach activities to raise awareness and promote understanding.

VIII. Encouraging experimentation and developing test environments (regulatory sandboxes)

Behavioural economics is an experimental discipline. The behavioural sciences have advanced and continue to grow thanks to empirical observations of how people decide and act as participants in social experiments. Public policies would undoubtedly benefit from this experimental approach, for example, by testing through pilot trials whether proposed measures will work as intended.

Progress has been made in this area both internationally and in Spain, placing greater emphasis on scientific evidence and knowledge in advising on public policies. For example, the National Scientific Advisory Office and the network of ministerial scientific advisors developed in recent years in Spain are noteworthy. This Office and its advisors can serve as a meeting point between public officials and scientists to build a common procedure and language for identifying, analysing, prioritising, and evaluating public policies.

Along these lines, a behavioural sandbox for regulation and public policies can offer the flexibility, rigour, and certainty needed to assess their efficiency and effectiveness. It helps in enhancing intervention design, resolving doubts, and even confirming or rejecting projects based on the results. This can be especially valuable in the domain of innovative behavioural measures, where there may be increased risk or uncertainty. It also aligns with the aim of conducting rigorous ex-ante evaluations supported by data and experimentation. Successful experiences with sandboxes already exist in Spain, such as the financial sandbox, which permits financial innovations to be tested in a safe and controlled environment.

Therefore, it is advisable **to encourage experimentation and establish a behavioural economics sandbox** to support the design and assessment of this kind of intervention. The sandbox could include testing protocols and be linked to the institutional framework and behavioural economics teams, enabling any administration to propose projects and take part in the design and execution of the tests. Additionally, it should be recognised that experimentation and the

application of empirical evaluation methods for public policies require dedicated financial resources and technical skills, so a specific and adequate budget and training must accompany their promotion.

IX. Preventing and eliminating sludge

“Sludge" refers to various obstacles (complex forms, lack of information, redundant or inadequate requirements, etc.) that can reduce the efficiency and effectiveness of public policies. Furthermore, they tend to be more detrimental to those with fewer resources to address them, who are typically lower-income or more vulnerable people.

Some countries have started taking measures to prevent and address these obstacles by applying structured methodologies that help them identify, quantify, and either avoid or eliminate these barriers in public procedures and services. Among other initiatives, they suggest conducting audits of these obstacles. International references include, among others, the experiences and methodologies provided by the International Sludge Academy and those proposed by the Behavioural Insights Unit of the New South Wales Government in Australia.

Based on the above, it is recommended **to develop tools and mechanisms to systematically prevent and remove behavioural barriers**, thereby improving the effectiveness of regulations and public policies. To achieve this, structured methods could be introduced to facilitate the detection of these obstacles when designing new regulations or public policies. Sludge audits could also be proposed to identify and eliminate existing barriers in current regulations and programmes. Behavioural economics units, if established, could play an essential role in this activity. It would be prudent to adopt international best practices in sludge mitigation, following the recommendations of the OECD and successful experiences in other countries. All of this could help to improve public policies, particularly benefiting those with fewer resources or limited capacity to address such obstacles. Furthermore, reducing these barriers would contribute to a more positive experience for citizens when interacting with the government, thereby strengthening trust in institutions.

X. Keep promoting transparency and data availability to support the assessment of public policies

Assessing the effectiveness of public regulations and policies requires systematic and rigorous data collection. Providing simple access procedures, whenever possible, would enable the research community to conduct its own analyses and evaluations, enriching knowledge and debate on how to improve public regulations and policies. To achieve this, expanding data availability as much as

possible and maintaining a coherent method for recording and publishing data can support this effort, also for the evaluation of the behavioural aspects of public policies.

Therefore, it is advisable to **keep promoting transparency and data availability to support the research community in assessing public policies**. Specifically, collecting and publishing valuable data for public intervention assessment from a behavioural perspective could be beneficial. If created, behavioural units could propose new databases to administrations and also develop and publish their own when feasible and suitable. Fostering a data-driven culture and governance across all levels of administration —enabling direct and transparent access to a data catalogue, primary sources, or raw data with accompanying metadata— would promote a culture of experimentation. This, in turn, would strengthen the evaluation of public policies, leading to improvements in their effectiveness, efficiency, and proportionality. Ultimately, this would lead to improved public service and enhanced institutional confidence.

THIRD. INCLUDE BEHAVIOURAL ECONOMICS INTO MARKET SUPERVISION

XI. Incorporating the behavioural approach into the work of supervisory authorities

The adoption of behavioural economics tools by economic operators has important consequences. Even in the absence of significant obstacles or constraints, cognitive biases can lead citizens (and also businesses, institutions, etc.) to make decisions that are not aligned with their interests, reducing competition and efficiency in markets. Companies can also actively exploit this vulnerability, for example, through dark patterns or other practices that may have anti-competitive effects or breach consumer protection regulations. Consequently, supervisory authorities must monitor these instruments to prevent misuse or abuse.

It is therefore advised that **behavioural considerations be systematically incorporated into market supervision activities**. This approach may be especially relevant in areas such as competition and consumer protection, as well as for supervising sectors prone to issues arising from cognitive biases, including, among others, digital services, healthcare, finance, and gambling. Behavioural economics can enhance the effectiveness of market supervision policies, particularly by aiding the identification of sanctionable conduct rooted in the exploitation of cognitive biases —such as abusive behaviour that breaches competition rules— and by underscoring the significance of considering how business practices influence actual consumer behaviour in the markets.

To implement this approach, it would be advisable for supervisory authorities to equip themselves with the necessary resources and human capital, and to consider developing guidelines and best practice guides for supervision. All of this could be achieved in collaboration with any established behavioural economics units, and even the creation of behavioural units within the supervisors themselves could be considered.

XII. Reinforcing prevention and awareness of regulatory compliance in behavioural economics

Measures and actions aimed at preventing regulatory non-compliance are crucial for ensuring the proper functioning of markets. Consequently, it is vital for companies and consumers to be aware of regulations and to be committed to adhering to them. To facilitate this, supervisory authorities with detailed knowledge of the market conditions and challenges could assist in identifying and promoting measures designed to prevent regulatory breaches. This is especially important in the area of behavioural tools, as they can sometimes be complex or obscure but still have a significant impact.

Therefore, it is recommended to **strengthen prevention and awareness-raising efforts in the field of behavioural economics to improve compliance with regulations**, particularly those related to consumers, competition, and the proper functioning of markets. This task can involve all supervisory authorities, in collaboration with other administrations when appropriate. Behavioural units, if established, could assist in this effort. Various actions could be proposed, including, among other options, information dissemination, training, and awareness-raising activities on behavioural issues, as well as promoting transparency regarding these tools. Additionally, raising awareness of consumer and user rights so that they can exercise them when appropriate, including in the context of claiming damages for regulatory non-compliance. Likewise, companies could be encouraged to incorporate behavioural considerations into their internal regulations for regulatory compliance, and collaborations between the administration, consumer organisations, and the private sector could be proposed to develop initiatives that promote regulatory compliance.

XIII. Enhancing collaboration and coordination on behavioural issues between supervisory and regulatory authorities

The increasing complexity of economic activity and market functioning has led to supervisory work on various issues carried out by different authorities. This also applies to regulation. For regulation to be effective and support the proper functioning of markets, good collaboration and consistency among the various authorities are essential. This general principle also impacts the behavioural

sphere, as differences in criteria can create legal uncertainty and obstruct the proper functioning of markets.

Therefore, it is recommended **to strengthen collaboration and coordination on behavioural issues among supervisory and regulatory bodies** to achieve a coherent and robust approach that provides certainty. Dialogue between authorities and coordination mechanisms can help ensure the most appropriate response to each problem. Furthermore, this collaboration can also facilitate the dissemination of best practices and knowledge on behavioural matters issues.

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ANNEX I: MAIN *NUDGE UNITS*

Germany

Since 2015, Germany has had the federal policy laboratory Citizen-Centred Government. This unit concentrates on designing public policies based on the latest social science research, co-creation with citizens, and evaluating policies through measurable results. After identifying major barriers citizens face with certain administrative procedures, they have dedicated much effort to streamlining regulations and improving interactions with authorities, in areas such as vehicle registration, maternity leave compensation, and income tax returns.

Australia

Australia is one of the most active countries in the development and application of behavioural economics in the public sector.

New South Wales (NSW) state government launched Australia's first *nudge unit,* the NSW Behavioural Insights Unit. This unit collaborates with various state agencies on interventions that seek, for example, to reduce missed court and medical appointments, facilitate the acquisition of professional certifications, and promote the use of public libraries. Furthermore, this unit is a world leader in the fight against sludge. They have developed a toolkit to improve public communications, achieve greater and better form completion, as well as a method for "sludge auditing". Since 2023, they have collaborated with the OECD to disseminate this auditing system through the International Sludge Academy, through which they are training and guiding 14 other institutions in identifying frictions between the administration and citizens.

At the federal level, the Behavioural Economics Team of the Australian Government (BETA) was established in 2017 as part of the Department of the Prime Minister. In recent years, it has delivered projects in collaboration with the Department of Social Services, the Australian Competition and Consumer Commission (ACCC), the Department of Industry, Science and Resources, and the Department of Climate Change, Energy, the Environment and Water, among others.

BETA publishes all its projects on its website, with the goal of transparency, increasing replicability, and reducing publication bias. It also has a Learn Hub, an open educational platform with resources, guides, case studies, and tools designed to foster the application of behavioural economics in the public sector.

Canada

The Impact and Innovation Unit (IIU) was established in 2017 within the Privy Council Office, which directly advises the Prime Minister of Canada. It was part of the Canadian government's commitment to strengthening evidence-based policy and the use of behavioural science to improve public services. The IIU inherited and expanded the work of the innovation team previously located at the Treasury Board Secretariat, integrating design, evaluation, and data analysis approaches.

Its key functions include behavioural public policy design, experimentation (with an innovation and data lab) and evaluation to measure the real-world impact of government interventions, advice and collaboration with ministries, and training and dissemination through practical tools and guides to increase the capacity of the Canadian public sector in evaluation and behavioural thinking.

Some projects aimed to increase participation in energy efficiency programs, reduce the use of single-use plastics through regulatory messaging, improve tax filing among vulnerable populations, and promote more informed health decisions among patients.

European Commission

In 2019, the European Commission established the Competence Centre on Behavioural Insights (CCBI), which is coordinated by the Joint Research Centre (JRC) and was established as part of the EU Policy Lab. Its main objective is to support EU policymaking by incorporating a behavioural approach.

This unit provides technical assistance services to Commission directorates-general, conducts empirical research on human behaviour, and promotes training through seminars, workshops, and communities of practice. It works in diverse thematic areas such as health, sustainability, energy, finance, social inclusion, artificial intelligence, public communication, and emergency preparedness. It also maintains a public database of studies, training resources, and intervention results, and publishes strategic reports such as "Unlocking the full potential of behavioural insights for policy" (2025).

USA

The Office of Evaluation Sciences (OES) was founded in 2015 within the General Services Administration (GSA) as part of the US Digital Service and President Barack Obama's initiative to improve the application of evidence and behavioural sciences in public administration. Its origins are linked to the Presidential Social and Behavioural Sciences Team (SBST), which operated since 2014 and was formalised by an Executive Order in 2015. After the end of Obama's term, the

team was institutionalized as the Office of Evaluation Sciences to ensure its continuity.

The OES works with more than 30 federal agencies, including the Departments of Defence, Health, Education, Treasury, and Agriculture, to improve public policy through evidence and experimental methods (including nudges). Its key functions include the design of behavioural interventions, the application of behavioural science principles to improve policy effectiveness, rigorous policy evaluation, randomised controlled trials (RCTs) and other experimental methodologies for evaluating outcomes, and fostering interagency collaboration. To this end, the OES publishes its results and methods so that different entities (domestic, international, and academic) can learn from and replicate good practices. It also helps train public officials to integrate behavioural thinking and evaluation into their daily work.

Some examples of the projects they have participated in include those aimed at increasing health insurance renewal rates, improving participation in educational programs, increasing retirement savings for public employees, and reducing student loan delinquency through personalised messages.

At the local level, there are units like Lab@DC , which has been using behavioural tools and big data to address specific urban problems since 2017. Focusing on issues relevant to Washington, DC, the Lab designs interventions around access to transportation, homelessness and housing support, education promotion, and more.

New York City holds a distinct *nudge unit* format in the form of ongoing collaboration with an external consulting firm. The so-called "embedded behavioural design team" was created in 2018 in partnership with ideas42, a pioneering consulting firm in the field that was previously involved in establishing the Social and Behavioural Sciences Team at the White House. This team assists in applying behavioural sciences to any part of city administration. Its activities focus on projects to encourage the use of social and educational programs, especially for marginalised or at-risk groups, and on simplifying procedures for accessing these benefits, as well as for paying fines or seeking healthcare.

France

The French Government initiated projects in behavioural economics in 2013 through the *Secrétariat Général à la Modernisation de l'État* (SGMAP). In 2017, the restructuring of this body gave rise to the *Direction interministérielle de la transformation publique* (DITP), which houses the *Cellule Sciences Comportementales*, responsible for behavioural policy design and evaluation.

Their activities include training and guides on applied behavioural economics, focusing on topics such as streamlining administrative projects and inclusive

public policy design. They also collaborate with various ministries and agencies on policy design, with examples such as encouraging the use of electronic means to communicate with healthcare administration and studying deceptive practices in online commerce.

Ireland

The Behavioural Research Unit (BRU) is part of the Economic and Social Research Institute (ESRI). This non-profit organisation operates autonomously with the aim of producing independent research on public policy, although it receives 25% of its annual income from the Irish State and has numerous ties to public service.

Their projects, commissioned and funded by institutions such as the Environmental Protection Agency and the Departments of Health and Finance, combine technical and scholarly publications with rigorous experimental evaluations.

Latin America

In 2016, Mexico 's Laboratorio Nacional de Políticas Públicas (LNPP) established the Innovation, Behaviour, and Experimentation Unit (UCEx) to apply behavioural approaches and experimental methods to public policy design. In addition, in Mexico, BIT has collaborated with the Federal Government in designing interventions in the areas of financial inclusion, corruption, and taxation.

Interest in behavioural economics has grown significantly in the region over the past decade. Between 2021 and 2023, Argentina established the Behavioural Sciences and Public Policy Unit within the Ministry of Economy. In 2023, Brazil founded Ciências Comportamentais Em Governo (CINCO) Unit within the Ministry of Innovation. Its objective is to help public policymakers find innovative solutions using behavioural lenses and initially focused on agroecology and sustainable public procurement. That same year, in Uruguay, Ceibal, the state centre for educational innovation and digital technologies, created its Laboratorio de Ciencias Comportamentales, developed in collaboration with BIT. The initial objective was to identify frictions and design behavioural interventions to improve school attendance.

United Nations

Various agencies within the United Nations ecosystem incorporate the behavioural approach into their strategies. These include the World Bank, which has established the Mind, Behaviour and Development Unit (eMBeD), UNICEF's

Behavioural Insights Research and Design Laboratory (BIRDLab), and the World Health Organization's Behavioural and Cultural Insights (BCI).

OECD

The OECD's Regulatory Policy Unit conducts work related to behavioural economics and has collaborated with public administrations in various countries (such as Canada, Mexico, Ireland, Oman, and Colombia) to design and evaluate public interventions. It has also published guides for the development of public policies, general lessons based on the results of accumulated evidence, and guidelines for the introduction of nudges and *behavioural insights* in different areas of public sector action, including competition policy and consumer protection. It has also promoted the OECD's Behavioural Research in Action International Network (BRAIN), which involves more than 100 government officials working on behavioural analytics initiatives in more than 50 countries, including both OECD and non-OECD members. This informal network fosters the exchange of good practices and mutual learning among policymakers and has several working groups on specific topics, such as sludge, competition policy, behavioural public administration, behaviours related to environmental sustainability, and artificial intelligence.

Netherlands

The Behavioural Insights Network Netherlands (BIN NL) is an inter-ministerial network established in 2014, serving as a forum for dialogue and the exchange of knowledge and best practices within public administration. Its core team and secretariat are attached to the Ministry of Economic Affairs and Climate Policy, and all ministries and state agencies have a contact person to coordinate and share information on behavioural economics interventions. Furthermore, BIN NL produces various documents and resources on the use of behavioural insights in government, including the biannual publication "*A Wealth of Behavioural Insights*" a compilation of all applications of behavioural sciences that have been carried out in government and presented to the public and to the Dutch House of Representatives with the aim of maximising transparency. The latest publication, from 2023, includes 34 use cases of behavioural tools in different areas of government, a description of the scientific basis for the intervention, and the final impact assessment on citizens.

United Kingdom

Behavioural Insights Team (BIT) was initially created as an administrative unit within the *Cabinet Office* (the Cabinet Office of the Prime Minister of the United

Kingdom). It was later privatised and, in 2021, acquired by Nesta, a British public innovation foundation[83]. The BIT currently has offices in Australia, Canada, France, the United States, and Mexico, and operates throughout Latin America.

From these offices, they offer training, public policy design and evaluation services, as well as applied research, aimed at NGOs, companies, and public entities, including those that already have their own behavioural economics units. In several cases, the BIT has collaborated in the creation of these units and maintains long-term collaboration agreements with them.

For example, in addition to its numerous projects with various British government departments, BIT has participated in at least 10 interventions developed by the French DITP, covering a wide variety of topics.

83 Nesta is a British charitable foundation dedicated to social innovation. Its aim is to help solve some of the United Kingdom's greatest social challenges using evidence-based approaches, technology, design, and experimentation. Founded in 1998 as the *National Endowment for Science, Technology and the Arts*, Nesta has operated since 2012 as an independent non-profit foundation and public innovation laboratory, combining research, policy design, pilot programs, and impact evaluation. Its current areas of work focus on three main missions: Health, Education, and Sustainability.