

Policymaking at the Edge of Rationality: The Three Bounds Revisited

Rao Aryan Niranjana

Graduate from Raffles Institution, Singapore (2024)

DOI: 10.46609/IJSSER.2025.v10i10.007 URL: <https://doi.org/10.46609/IJSSER.2025.v10i10.007>

Received: 28 September 2025 / Accepted: 11 October 2025 / Published: 17 October 2025

ABSTRACT

Neoclassical economics has long guided governments in policymaking, from using expansionary fiscal policy to counter recessions to implementing financial incentives to address externalities. However, its assumptions, such as perfect information and the human capacity to perform comprehensive cost-benefit analyses, often do not hold in practice. Behavioral economics addresses these limitations, suggesting that policy design should complement traditional tools with behavioral insights, especially for decisions involving complex choices by households and firms. This paper explores how behavioral economics can inform policymaking by first examining decision-making under uncertainty through the lens of System 1 and System 2 thinking. It then discusses heuristics and cognitive biases arising from imperfect information, and introduces the Three Bounds of human nature: bounded rationality, bounded willpower, and bounded selfishness. Finally, the paper evaluates the application of these bounds in policy design, using global case studies. Findings indicate that integrating nudge theory with traditional incentives enables governments to effectively influence behavior, advancing both microeconomic and macroeconomic goals while enhancing societal welfare.

Keywords: behavioral economics, bounded rationality, bounded willpower, bounded selfishness

Introduction

In 1776, Adam Smith introduced the concept of the “Rational Choice Theory”, stating that individuals tend to act in self-interest to maximise their personal utility, after doing a thorough cost-benefit analysis (Smith, 1904), setting the foundation for neoclassical economics. This standard model of human behavior is based on many various assumptions, one of which is ‘anti-behavioral’ (Mullainthan and Thaler, 2000). In particular, it assumes that humans possess three unviable traits: unbounded rationality, where humans possess a divine cognitive ability to make completely rational decisions; unbounded willpower, where humans have non-negotiable self-discipline to resist immediate gratification and focus on their long-term goals; and unbounded

selfishness, where individuals consistently act in their own self-interest without regard for the well-being of others. Additionally, these traits are based on the impractical assumption that economic agents have complete information on all the possible combinations.

To counter these assumptions, various psychologists and economists – from Daniel Kahneman and Amos Tversky (1979) to Herbert Simon (1990) proposed infusing a sense of psychological realism into classical decision-making frameworks. In particular, opposing the three aforementioned traits, Mullainathan and Thaler (2000) introduced the “Three Bounds of Human Nature” in their Behavioral Economics paper. It reviews the applicability of behavioral economics to the fields of finance and savings. For instance, they highlighted how investors overreact to new information, falling prey to the representativeness heuristic, which led them to judge recent news as indicative of long-term trends. This led to mispriced assets and market corrections, challenging the assumption of rational behavior in finance. Interestingly, they suggested that such behavioral insights can inform smarter policy design by accounting for these limitations. In particular, one sentence stood out - “The standard economic model of human behaviour includes (at least) three unrealistic traits: unbounded rationality, unbounded willpower, and unbounded selfishness. These three traits are good candidates for modification” (Mullainathan & Thaler, 2000).

This paper aims to answer the following research questions:

1. How valid is the aforementioned claim by Mullainathan and Thaler?
2. What are the practical applications of these modifications to policymaking around the globe?

This research paper argues that this claim is valid to a large extent and can be integrated by the government into its policies to maximize citizen welfare, rather than basing them solely on inaccurate neoclassical economic models.

The Foundations of Behavioral Economics

Prior to the advancement of the Three Bounds, Kahneman and Tversky proposed the Dual Process Theory. This theory outlined the idea that the mind operates in two separate but interconnected systems - System 1 (S1) and System 2 (S2). System 1, the automatic system, refers to fast and impulsive decision-making, which allows us to make rapid decisions based on previous experiences. Meanwhile, System 2, the controlled system, refers to slow and conscious decision-making that requires deliberate effort (Kahneman & Tversky, 1983).

In an ideal scenario, as outlined by the neoclassical decision-making model of unbounded rationality, willpower and selfishness, it follows that humans would always resort to System 2

thinking. They would analyse every cost and benefit, and make a rational decision by weighing them against each other and maximising their utility. This would naturally lead to more optimal results, compared to the rushed nature of System 1 thinking (Kahneman & Tversky, 1983).

However, in reality, humans lack perfect information to consider every possibility to analyse its individual costs and benefits. For instance, when forex investors use future value calculations to make investment decisions on the dollar, they face uncertainty (Kahneman & Tversky, 1983). Multiple factors, from macroeconomic uncertainty to geopolitical relations, give rise to too many permutations to account for. Hence, they resort to heuristics – mental shortcuts that allow people to solve problems and make decisions with speed and efficiency.

Another notable theory that helps us explain this is the Fuzzy-Trace Model. This model includes two types of processing: gist and verbatim. Gist-based processing involves decision-making that consists of the summarised, basic meanings of information, and is typically associated with System 1 thinking (Reyna & Brainerd, 2011). Verbatim-based processing, on the other hand, refers to decision-making that considers. As detailed by Kahneman and Tversky, due to uncertainty, humans tend to rely on gist-based processing over verbatim, employing the use of heuristics. For example, day-to-day Japanese citizens are likely to recall the high risk of a tsunami from a tsunami warning, rather than memorizing precise statistics.

Kahneman and Tversky mainly identified three types of heuristics used by humans: representativeness, availability, and adjustment and anchoring (Kahneman & Tversky, 1983).

The representativeness heuristic refers to how humans classify something based on a particular stereotype that they associate it with. For example, a quiet and bookish individual is more likely to be assumed to be a librarian than an athlete.

The availability heuristic refers to the tendency to judge the probability or importance of an event based on how easily it comes to mind. For instance, one may associate the risk of cardiac arrest among middle-aged people by recalling such occurrences among one's acquaintances.

Finally, adjustment and anchoring refer to the phenomenon where people over-rely on an initial piece of information (the 'anchor') and make minimal adjustments from their initial position. For example, if a seller quotes a high initial price in a negotiation, the final price might be higher than if there was no anchor price, even if the seller lowers their price.

Additionally, overreliance on these heuristics can lead to cognitive biases, which are systematic errors in decision-making that result in suboptimal outcomes (Kahneman & Tversky, 1983).

These foundational understandings of behavioral economics lend support to the establishment of the Three Bounds of Human Nature. These behaviors can be summarized in the form of bounded rationality, willpower and selfishness. It is also suggested that policymakers should implement nudges that play on these tendencies to achieve outcomes that maximise social welfare, as well as inclusive and sustainable development (Mullainathan & Thaler, 2000).

Challenging The Three Traits: The Three Bounds

In 1972, Herbert Simon introduced the concept of bounded rationality, the first bound of human nature. He posited that rationality is bounded because, in reality, humans are limited by their cognitive abilities, and as a result, their decision-making cannot be fully rational (Simon, 1972). This is especially true when someone makes decisions with multiple options present. For instance, in the example of forex investing, pondering each combination requires a lot of time, causing humans to lean towards S2 thinking. However, due to the lack of time and cognitive ability to consider every possibility, humans fall back on S1 thinking, which leads to cognitive biases, resulting in a seemingly irrational decision. Another prominent example of bounded rationality is seen in public policy. Government-run schemes often have numerous complications that citizens struggle to fully comprehend. Consequently, citizens may use simplified heuristics to make a quick and satisfactory decision, tending toward satisficing behavior rather than maximizing behavior, which leads to reduced effectiveness in programs achieving their intended outcome. Governments can combat this by implementing subtle nudges and choice architecture. For example, the US government uses a nudge by making the default option when applying for a driver's licence "Yes" when they are faced with the question of whether they would like to be an organ donor. Organ donation is a complex process that requires both a deep understanding and time to make a decision, which aspiring drivers may not always have. Due to this, they rely on the default nudge set by the government, as it functions as a heuristic to simplify their decision-making process, especially since 67% of US citizens claim to trust their local governments (Jones, 2023). The US Government leveraged this to achieve the intended outcome of increased organ donation rates, which successfully rose by 143% (Thaler & Sunstein, 2021). Thus, bounded rationality can introduce nudges into public policy to simplify the decision-making process and tweak the results towards the intended favourable outcome, making it valid to modify unbounded rationality.

Moving on to unbounded willpower, behavioural economics challenges its assumptions as it recognizes that cognitive biases, limited attention spans, and emotional factors often influence human decision-making. A significant cognitive bias that comes to mind is that of hyperbolic discounting. Hyperbolic discounting refers to the tendency to prioritize the present situation over future outcomes when making decisions (Laibson, 1997). This causes individuals to prioritize short-term gratification over long-term benefits, even when such choices reduce overall net

benefits and therefore appear irrational. In the context of government policies, this is particularly relevant to retirement plans. The theory suggests that individuals are willing to be patient in the distant future, but in the short run, where impatience dominates, immediate rewards consistently take precedence. This prioritization of short-term consumption creates an opportunity cost, as consumers focus on immediate needs rather than long-term financial security, ultimately resulting in a net utility loss and an irrational outcome. Consequently, individuals may indefinitely delay enrolling in retirement programs, rendering such policies ineffective and leaving many people without adequate savings for old age. To mitigate the risk of a large-scale loss of social benefits, the Singapore government has integrated inertia into its CPF scheme by implementing automatic salary deductions. This establishes a savings habit in citizens, making them more likely to maintain it due to the extra effort required to opt out of it. As a result, the overall household savings rate increased from 10% in 1955 (before the CPF was introduced) to 44% in 2020 in Singapore (Ong, 1982), suggesting that decision inertia can mitigate the impact of bounded willpower, making it valid to consider modifying unbounded willpower.

Thirdly, behavioural economics challenges the notion of unbounded selfishness. Traditional economic theory emphasizes self-interest as the primary motive for economic agents, particularly evident in the classic free-rider problem, where individuals are unlikely to contribute to the public good unless their private welfare is improved. However, such a view is too myopic in the real world because of the social nature of humans. Having been involved in society for years, these social creatures have an innate sense of empathy for other humans who may be in worse situations than they are. This leads to humans undertaking altruistic endeavours such as monetary donations, as well as engaging in acts of community service like volunteering at soup kitchens. By giving up their own resources and utility (money and time) to better the condition of the less fortunate, altruistic behavior opposes the assumption behind unbounded selfishness. Taking concern and corrective action for societal well-being, even at personal cost, can also influence public attitudes towards taxation and redistribution policies, where citizens may be more willing to support a progressive tax system to achieve lower levels of income inequality, despite having to pay more to fund it. Following the 2008 financial crisis, Iceland implemented a wealth tax to enhance economic conditions by redistributing wealth within the country and reducing the income inequality gap (OECD, 2011). Despite facing personal economic hardship, Icelandic citizens did the opposite of what the neoclassical model would suggest: they supported the wealth tax, with over two-thirds of Icelanders favouring progressive taxation, demonstrating their altruistic nature and how the assumption of unbounded selfishness can be modified to a large extent.

Limits of the Three Bounds

However, while these three traits can be accounted for and their impacts can be minimized by governments when drafting policies, it isn't necessarily reflective of how everyone in the populace responds. They cannot be used as a one-size-fits-all solution. The challenges posed by behavioural economics are subjective in nature and do not apply to all citizens. Additionally, for those who display the use of bounded rationality, willpower, and selfishness, it is close to impossible to predict the extent to which each of these traits plays a part in their decision-making process, and it becomes challenging to optimize the modification of the three traits.

In 2008, Germany launched a behavioural nudge experiment, 'StromsparCheck', to reduce household energy consumption (European Commission, 2020). Households received personalised reports comparing their energy use to neighbours, hoping to trigger social comparison and encourage efficiency. A 2012 study on the program found a 2% average reduction in electricity consumption among participants, but also revealed significant heterogeneity in responses, with some households achieving reductions of up to 20% while others showed no change (Allcott, 2011). This indicates that while they give us a more comprehensive understanding, bounded rationality, willpower, and selfishness manifest differently across individuals and contexts. Policies designed to target one trait might not address others or even backfire in specific situations.

Additionally, policymakers might find it useful to strike a balance between methods suggested by traditional and behavioral economics. For example, in Chile, the government has adopted such an approach to controlling the consumption of sugar-sweetened beverages. Traditional economics-wise, SSB taxes are implemented, as they play on financial disincentives. Behavioral economics-wise, SSBs are marketed with large, black-and-white warning labels about their sugar content, which play on the salience bias of customers to persuade them to switch to healthier options. As a result, the purchase of SSBs was reduced by 24% (Taillie et.al, 2020).

Conclusion

Ultimately, the claim made by Mullainathan & Thaler is valid to a large extent. The limitations noted in the previous section remain relatively minor within the broader framework. This is because optimisation is not the central purpose of modifying the three traits. Instead, acknowledging the subjectivity of these limitations provides a more nuanced and comprehensive understanding of decision-making than the unmodified versions. That said, this essay has so far treated the three traits – bounded rationality, willpower, and selfishness – as equally significant, which is not entirely accurate. Each has distinct applications depending on the context. Of the three, unbounded selfishness is the most difficult to modify and the least convincing, since

altruism cannot always be reduced to bounded selfishness; noble endeavours may themselves be motivated by satisfaction or fulfillment. In the short run, bounded willpower may be more relevant than bounded rationality, given the prevalence of hyperbolic discounting, which leads agents to favor short-term gains over long-term benefits. However, in the long run, the influence of hyperbolic discounting diminishes, while bounded rationality – rooted in human cognitive limits – remains a constant.

Nevertheless, when limitations do arise, policymakers can benefit from combining insights from both neoclassical and behavioral economics to design solutions that maximize societal welfare. The three bounds should not be treated as a one-size-fits-all solution but rather applied with sensitivity to context and circumstance.

Bibliography

Allcott, H. (2011). Social norms and energy conservation. *Journal of Public Economics*, 95(9-10), 1082–1095. <https://doi.org/10.1016/j.jpubeco.2011.03.003>

European Commission. (2020). *Stromspar-Check (energy-saving check) | Energy Poverty Advisory Hub*. Europa.eu. <https://energy-poverty.ec.europa.eu/discover-community/epah-atlas/stromspar-check-energy-saving-check>

Jones, J. (2023, October 13). *Americans Trust Local Government Most, Congress Least*. Gallup.com. <https://news.gallup.com/poll/512651/americans-trust-local-government-congress-least.aspx>

Kahneman, D., & Tversky, A. (1979). Prospect theory: an Analysis of Decision Under Risk. *Econometrica*, 47(2), 263–292. <https://doi.org/10.2307/1914185>

Kahneman, D., & Tversky, A. (1983). Judgement under Uncertainty: Heuristics and Biases. *Journal of Marketing Research*, 20(2), 217. <https://doi.org/10.2307/3151689>

Laibson, D. (1997). Golden Eggs and Hyperbolic Discounting. *The Quarterly Journal of Economics*, 112(2), 443–478. <https://doi.org/10.1162/003355397555253>

Mullainathan, S., & Thaler, R. H. (2000). Behavioral Economics. *SSRN Electronic Journal*. <https://doi.org/10.2139/ssrn.245828>

OECD. (2011). *Divided We Stand*. OECD. <https://doi.org/10.1787/9789264119536-en>

Ong, T. C. (1982). *TEXT OF SPEECH ON CENTRAL PROVIDENT FUND BY MINISTER FOR LABOUR AND COMMUNICATIONS AT THE*. <https://www.nas.gov.sg/archivesonline/data/pdfdoc/otc19821031s.pdf>

Reyna, V. F., & Brainerd, C. J. (2011). Dual processes in decision making and developmental neuroscience: A fuzzy-trace model. *Developmental Review*, 31(2-3). <https://doi.org/10.1016/j.dr.2011.07.004>

Simon, H. (1972) Theories of Bounded Rationality. In: McGuire, C.B. and Radner, R., Eds., *Decision and Organization*. Elsevier, Amsterdam, 161-176.

Simon, H. A. (1990). Bounded Rationality. *Utility and Probability*, 15–18. https://doi.org/10.1007/978-1-349-20568-4_5

Smith, A. (1904). An Inquiry into the Nature and Causes of the Wealth of Nations. Adam Smith. *Journal of Political Economy*, 13(1), 136–136. <https://doi.org/10.1086/251119>

Taillie, L. S., Reyes, M., Colchero, M. A., Popkin, B., & Corvalán, C. (2020). An evaluation of Chile's Law of Food Labeling and Advertising on sugar-sweetened beverage purchases from 2015 to 2017: A before-and-after study. *PLOS Medicine*, 17(2), e1003015. <https://doi.org/10.1371/journal.pmed.1003015>

Thaler, R. H., & Sunstein, C. R. (2021). *Nudge: Improving decisions about money, health, and the environment*. Penguin Books, An Imprint Of Penguin Random House Llc. (Original work published 2008)