THE COGNITIVE TRAP: HOW SCARCITY MINDSET REPRODUCES AND DEEPENS INCOME INEQUALITY

Scientific Researcher, Ph.D. Candidate, Mihail CIOBANU
Section "Social research and the standard of living",
National Institute for Economic Research, Academy of Economic Studies of Moldova
E-mail: ciobanu.mihail.s@gmail.com

Abstract: *Literature on income inequality concentrated predominantly on structural and macroeconomic explanations - capital accumulation dynamics, labour market segmentation, and redistributive fiscal policy. We argue that an essential cognitive dimension has been systematically neglected: the manner when scarcity, as a psychological condition, actively reproduces and deepens inequality through mechanisms that operate independently of, and in interaction with, material resource deficits. Drawing on Piketty's structural analysis of capital divergence, Mullainathan and Shafir's theory of scarcity mindset and cognitive tunneling, Kahneman's dual-process model of decision-making under load, and Sen's capability approach, we build an integrated theoretical framework centred on the Scarcity-Inequality Feedback Loop (SIFL). SIFL models inequality as a self-reinforcing cycle across five stages: structural scarcity rooted in the r > g dynamic, activation of the scarcity mindset, depletion of System 2 deliberate reasoning capacity, erosion of individual capabilities in Sen's normative sense, and consequent deepening of material inequality. Each stage is causally connected to the next, forming a loop in which cognitive impairment is both product and reproducer of economic disadvantage. We further develop inter-generational dimension of SIFL, showing how parental bandwidth depletion diminishes the cognitive investment available to children, transmitting inequality through developmental channels that persist independently of formal mobility structures. Cognitive reproduction mechanism is a structural feature of inequality, not individual failing; effective policy must therefore target cognitive relief alongside redistribution - through institutional simplification of welfare systems, slack-creating unconditional transfers, and early childhood investment as loop-breaking strategies. Contribution is theoretical; future empirical research is needed to estimate SIFL's transmission parameters across varying institutional contexts. The article was elaborated within the Project selected in competition "Stimulating excellence in scientific research 2025-2026" 25.80012.0807.37SE "The perfection of instruments for reducing income inequality and reducing poverty of the population in the process of European integration of the Republic of Moldova", institutional funding, ANCD.*

Keywords: *income inequality, bounded rationality, behavioural economics, social protection.*
JEL Classification: *D03, D31, D63, D91, I30, I38.*

1. Introduction

Why does income inequality persist and in many economies deepens even when redistribution mechanisms are formally in place? The macroeconomic literature offers compelling structural explanations: the divergence between the return on capital and the rate of economic growth, the erosion of labour's bargaining position, the concentration of asset ownership, and the inadequacy of tax-and-transfer systems. These forces are real and well-documented. Yet they leave a significant explanatory gap: they do not fully account for why poor individuals so frequently make decisions that appear, from the outside, to perpetuate their disadvantage, nor why the same structural conditions produce such dramatically different individual trajectories. In this paper we propose that the missing variable is cognitive. Scarcity, not merely as a material condition but as a psychological state, exerts a systematic and measurable effect on the quality of economic decision-making. This effect is not a character flaw or a failure of individual rationality; it is a predictable consequence of how the human cognitive system responds to resource constraint. When the mind is preoccupied by scarcity, its capacity for deliberate, forward-looking reasoning is diminished. The result is a pattern of decisions that appear myopic, inconsistent, or self-defeating, but are in fact the predictable output of a cognitive system operating under severe constraint. The

implications for inequality are profound. If scarcity systematically degrades the cognitive capacity through which individuals navigate economic life: managing finances, accessing entitlements, investing in human capital, planning for uncertainty, then inequality is not merely reproduced through structural mechanisms: it is reproduced through cognitive ones as well. The poor are not just materially disadvantaged; their disadvantage imposes a cognitive tax that compounds over time and resists purely redistributive remedies. We develop this argument through four theoretical traditions and synthesize them into an original model: the Scarcity-Inequality Feedback Loop (SIFL). The central research question is: ”Through what cognitive mechanisms does scarcity actively reproduce and deepen income inequality, and what are the implications for welfare policy design?” First it is established the structural baseline through Piketty’s framework of capital divergence, before introducing the cognitive mechanisms of scarcity and decision fatigue drawn from Mullainathan and Shafir and Kahneman. These are then connected to Sen’s capability framework, leading to the original SIFL model and its policy implications.

2. The structural baseline: Piketty’s inequality engine

Thomas Piketty’s *Capital in the Twenty-First Century (2014)* provides the indispensable structural backdrop for any contemporary analysis of income inequality. Piketty’s central argument is formally expressed like this: when the rate of return on capital (r) persistently exceeds the rate of economic growth (g), wealth accumulates faster than income grows, and the distribution of both becomes progressively more unequal over time. This dynamic captured in the now-famous expression $r > g$ is not a market failure or policy aberration; it is, Piketty argues, the historical norm of capitalist economies, interrupted only by the exceptional compression of the mid-twentieth century driven by war, depression, and progressive taxation. The distributional consequences of $r > g$ are severe. Capital income (returns on financial assets, real estate, and equity) accrues disproportionately to those already wealthy, while labour income (wages and salaries) constitutes the primary or sole income source for the majority of the population. As capital’s share of total income rises, the income share available to labour contracts. The result is a structural divergence between those who own capital and those who do not, which reproduces itself across generations through inheritance and compounds through the differential rates of return available to large versus small wealth portfolios. Piketty’s framework is, however, fundamentally a macroeconomic account. It describes the conditions under which inequality grows at the aggregate level; it does not explain why individual poor households fail to accumulate capital even when modest surpluses exist, why they systematically underutilise available social entitlements, or why the inter-generational transmission of poverty proves so resistant to disruption even in the presence of formal mobility channels. These questions require a theory of behaviour under scarcity - a micro-level account of how the experience of poverty shapes the economic choices through which structural outcomes are reproduced.

3. The scarcity mindset: tunneling and the bandwidth tax

Mullainathan and Shafir’s *Scarcity: Why Having Too Little Means So Much (2013)* provides the behavioural micro-foundation that Piketty’s structural account requires. Their central insight is that scarcity of money, time, food, or social connection is not merely an external material condition; it is an internal psychological state that fundamentally reorganises cognition. When individuals experience scarcity, their attention is automatically and

powerfully drawn toward the scarce resource, generating a state of cognitive preoccupation that the authors term the scarcity mindset. The scarcity mindset operates through two primary mechanisms that are directly relevant to inequality analysis. The first is tunneling: the tendency of scarce-minded individuals to focus narrowly on the immediate problem at hand, like managing this week's cash shortfall, resolving the current housing crisis at the expense of attending to matters outside the tunnel. This tunnel vision is not irrational from the perspective of immediate survival; it is a natural consequence of the mind's finite attentional resources being monopolised by pressing need. But it generates decisions that are systematically short-sighted: the poor borrower who takes an expensive payday loan to cover an immediate gap, foregoing longer-term financial planning; the overworked parent who misses a benefit application deadline because the cognitive resources to attend to it were simply not available. The second mechanism is the bandwidth tax. Mullainathan and Shafir demonstrate empirically that the cognitive preoccupation induced by scarcity consumes measurable quantities of working memory and executive control - the same cognitive resources that govern planning, impulse control, and complex problem-solving. The result is a reduced effective cognitive capacity, which they formalise as a tax on bandwidth: the poor are not cognitively less capable than the wealthy in any intrinsic sense; they are operating with less cognitive capacity available after the bandwidth cost of scarcity preoccupation has been levied. The practical consequence is a systematic gradient in decision quality along the income distribution. Wealthy individuals, whose cognitive bandwidth is not consumed by financial preoccupation, have greater effective capacity for deliberate, forward-looking decisions: saving, investing, negotiating, planning, and accessing complex entitlements. Poor individuals face the same decision environment with structurally depleted resources. The result is not a failure of character but a predictable output of constrained cognition - one that perpetuates and deepens the very inequality that generates it.

4. Decision fatigue and cognitive depletion: Kahneman's architecture

Daniel Kahneman's dual-process theory, developed across decades of experimental research and synthesised in *Thinking, Fast and Slow* (2011), provides the cognitive architecture through which the scarcity mindset impairs decision quality and generates welfare losses. Kahneman distinguishes two systems of mental processing. System 1 operates automatically, rapidly, and with minimal effort: it generates intuitions, heuristics, and immediate emotional responses. System 2 operates deliberately, slowly, and with significant cognitive effort: it governs analytical reasoning, complex calculation, and the override of System 1's automatic responses. The critical insight for inequality analysis is that System 2 is a depletable resource. Its capacity for sustained deliberate reasoning declines under conditions of cognitive load, fatigue, and stress - conditions that are endemic to the experience of poverty. When System 2 is depleted, individuals default to System 1 heuristics: they rely on automatic responses, accept default options, defer to immediate intuitions rather than deliberate analysis. Under ordinary circumstances, this is often adaptive. Under conditions of economic complexity, like navigating financial products, managing benefit applications, making investment decisions, it generates systematic errors. Kahneman's framework also illuminates the specific decision patterns that poverty generates.

Loss aversion - the tendency to weight potential losses more heavily than equivalent gains is amplified under scarcity: for those with no financial slack, even a small loss can be catastrophic, generating extreme risk aversion that forecloses potentially beneficial

investments. Present bias - the tendency to discount future rewards steeply relative to immediate ones intensifies when immediate needs are pressing, not because the poor have different time preferences but because the cognitive preoccupation of scarcity narrows the temporal horizon of deliberation. Anchoring effects distort financial negotiations.

The availability heuristic distorts risk assessment. These effects are not evenly distributed across the income distribution. The wealthy operate in environments with significantly more cognitive slack: more financial buffer against loss, fewer immediate crises demanding attention, greater access to professional advice that substitutes for their own cognitive effort. The poor operate with less slack, more load, and fewer cognitive supports. The result is a systematic disparity in decision quality that translates directly into economic outcomes - outcomes that Piketty's structural account records at the aggregate level but does not explain at the individual level.

5. Capability deprivation: Sen's lens on cognitive poverty

Amartya Sen's capability approach described in *Development as freedom* (1999) provides the normative framework that connects the cognitive mechanisms of scarcity and decision fatigue to the broader concept of human welfare and inequality. For Sen, the appropriate unit of welfare analysis is not income or utility but capabilities - the real freedoms that individuals have to live lives they have reason to value. Poverty, on this account, is capability deprivation: the absence of the real freedoms necessary for a fully human life, regardless of the income level that nominally corresponds to those conditions. The capability approach has been primarily applied to material and social dimensions of deprivation: the capabilities associated with health, education, political participation, and social relationships. We suggest an extension that has not been sufficiently developed in the literature: cognitive capacities including deliberate reasoning, effective financial management, long-term planning, and informed decision-making should be recognised as central human capabilities in Sen's framework, whose systematic erosion constitutes a form of poverty. When the scarcity mindset depletes cognitive bandwidth and decision quality, it does not merely impair economic efficiency; it erodes capabilities in Sen's normative sense. This extension has two important implications. First, it establishes that cognitive depletion under scarcity is a form of unfreedom - a constraint on the real capacity to choose and act - that is analytically distinct from, but causally connected to, material deprivation. A person whose cognitive capacity is systematically consumed by financial preoccupation is not fully free in Sen's sense, even if their nominal income places them above a conventional poverty line. Second, it implies that the inter-generational transmission of inequality operates not only through the material channels Piketty emphasises (inheritance, differential returns to capital), but through the transmission of cognitive disadvantage: children raised in cognitively depleted households, by parents whose bandwidth is consumed by scarcity, receive less stimulating cognitive investment in their own development, entering adulthood with reduced capabilities that perpetuate the cycle. Sen's framework thus provides the normative bridge between Mullainathan and Shafir's empirical account of cognitive impairment under scarcity and the structural account of inequality dynamics that Piketty documents. What Piketty measures at the macro level, and what Mullainathan and Shafir explain at the cognitive level, Sen evaluates normatively. Together, these three accounts describe a compound deprivation in which material poverty and cognitive poverty are mutually constitutive.

6. The scarcity-inequality feedback loop (SIFL): an integrated model

The four theoretical traditions reviewed above can be integrated into a unified model of inequality reproduction: the scarcity-inequality feedback loop (SIFL). The SIFL identifies a self-reinforcing cycle with five analytically distinct stages, each corresponding to a different level of analysis and a different body of theoretical literature:

Stage 1 - Structural scarcity (Piketty). The r > g dynamic concentrates wealth and capital income among the already wealthy, generating structural income inequality and material scarcity at the bottom of the distribution. This is the macroeconomic entry point of the loop: inequality produces scarcity, and scarcity is not randomly distributed but structurally allocated.

Stage 2 - Scarcity mindset activation (Mullainathan & Shafir). Material scarcity activates the scarcity mindset. The cognitive preoccupation of financial insecurity consumes bandwidth and induces tunneling - narrowing attention to immediate crises at the expense of longer-term planning, entitlement access, and human capital investment.

Stage 3 - System 2 depletion (Kahneman). The bandwidth tax of the scarcity mindset depletes System 2 capacity. Decision-making defaults increasingly to System 1 heuristics: loss aversion, present bias, availability errors, and anchoring distortions. The quality of economic decisions declines precisely when their stakes are highest.

Stage 4 - Capability erosion (Sen). Degraded decision quality translates into capability deprivation. Educational investments are deferred, health decisions are suboptimal, financial products are mismanaged, social entitlements are underutilised, and long-term planning is structurally impaired. These are not isolated failures but the predictable outcome of a cognitively depleted agent navigating a complex economic environment.

Stage 5 - Deepened material inequality. Capability erosion translates back into material outcomes. Reduced human capital accumulation limits earnings potential. Financial mismanagement limits asset accumulation. Under-utilisation of entitlements reduces effective income. These outcomes reinforce and deepen the structural inequality documented by Piketty, completing the loop and returning to its starting point at a higher level of disadvantage.

The SIFL can be formalised as a dynamic system in which inequality at time t generates cognitive conditions at time $t+1$ that determine inequality at time $t+2$. Let:

$$I(t) \rightarrow S(t) \rightarrow CB(t) \rightarrow Cap(t) \rightarrow I(t+1)$$

Where $I(t)$ denotes the level of income inequality at time t; $S(t)$ denotes the intensity of the scarcity mindset induced by that inequality; $CB(t)$ denotes the effective cognitive bandwidth available after the scarcity tax; $Cap(t)$ denotes the capability endowment of individuals at the bottom of the distribution; and $I(t+1)$ denotes the resulting inequality at the next period. The feedback relationship implies that $I(t+1) \geq I(t)$ unless policy intervenes to break one or more of the loop's links. The transmission parameter between each stage is not fixed: it depends on institutional context, policy design, and social supports. A society with robust automatic enrolment in social programmes reduces the cognitive burden of entitlement access, weakening the $S(t) \rightarrow CB(t)$ link. A society with high-quality, low-complexity public services reduces the cognitive demands of navigating health and education systems, protecting capability development even under bandwidth depletion. The SIFL thus identifies specific intervention points - not merely the income redistribution that addresses $I(t)$ directly,

but the cognitive and institutional interventions that interrupt the reproduction mechanism itself.

The SIFL's most consequential implication is its inter-generational dynamic. At each iteration of the loop, the capability endowment passed to the next generation is determined not only by the material resources parents can invest but by the cognitive resources they can deploy in child-rearing. Parental bandwidth depleted by scarcity translates directly into reduced quality of parent-child interaction, lower investment in early cognitive stimulation, and reduced engagement with educational systems. Children raised in cognitively depleted households enter the loop at a lower capability baseline, experiencing the scarcity mindset earlier and more severely, and facing a steeper structural disadvantage in the capital accumulation dynamics Piketty documents. The inter-generational SIFL thus provides a cognitive explanation for the empirical regularity of earnings persistence across generations - the finding that the income rank of parents is among the strongest predictors of the income rank of children, even in societies with formally open mobility structures. It also implies that the most effective long-term inequality reduction strategy is to break the loop at the capability stage: investments in early childhood development, cognitive enrichment for children in scarcity-affected households, and reductions in the cognitive burden imposed on parents by complex welfare and administrative systems generate returns that accumulate across generations, counteracting the SIFL's natural trajectory.

7. Policy implications

The SIFL framework generates a set of policy implications that are both complementary to and partially distinct from the redistributive prescriptions that dominate the inequality literature. Redistribution (progressive taxation, social transfers, minimum income guarantees) remains necessary: it addresses the structural root of the loop by reducing material scarcity. But the SIFL demonstrates that redistribution alone is insufficient, because inequality reproduction operates through cognitive channels that persist even when incomes are modestly equalised. Three additional classes of intervention follow from the framework.

Cognitive relief through institutional simplification. The most direct intervention against the scarcity mindset and its depletion of deliberate reasoning is the reduction of cognitive demands imposed by institutional environments. Social assistance systems with complex eligibility conditions, frequent reassessments, and multi-agency navigation requirements impose a bandwidth tax on their intended beneficiaries that partially offsets the welfare value of the transfers themselves. Automatic enrolment, benefit consolidation, plain-language communication, and proactive outreach - interventions that bring entitlements to beneficiaries rather than requiring beneficiaries to navigate to reach their entitlements - directly relieve cognitive load, releasing bandwidth for capability-building activities.

Slack creation as a policy instrument. Mullainathan and Shafir's analysis implies that the most effective buffer against the cognitive effects of scarcity is slack - the cognitive and financial breathing room that prevents the scarcity mindset from activating. Unconditional cash transfers, basic income schemes, and emergency savings programmes create financial slack that reduces bandwidth preoccupation without imposing additional cognitive demands. The welfare return on such transfers is therefore greater than their nominal value: it includes the cognitive dividend generated by relief from scarcity preoccupation, which enables better decisions across multiple life domains.

Early childhood investment as loop-breaking strategy. Given the inter-generational dimension of the SIFL, investments that protect the capability development of children in scarcity-affected households represent the highest long-term return intervention available. This includes direct cognitive enrichment programmes, support for parental bandwidth through reduced administrative burdens on families with children, and high-quality early childhood education that compensates for the cognitive investment that depleted parents cannot provide. The economic case for such investments documented extensively in the human capital literature from Heckman (2006) onwards is reinforced by the SIFL framework: they break the loop at its most consequential link.

8. Conclusions

We argued that income inequality is reproduced and deepened not only through the structural mechanisms of capital accumulation that Piketty documents, but through a cognitive feedback loop in which scarcity itself degrades the decision-making capacity through which individuals might otherwise escape it. The scarcity–inequality feedback loop integrates four foundational theoretical traditions - Piketty's structural dynamics, Mullainathan and Shafir's scarcity mindset, Kahneman's dual-process architecture, and Sen's capability framework - into a unified model of inequality reproduction that operates across material, cognitive, and normative levels of analysis. The SIFL's central implication is sobering: inequality is self-reinforcing in ways that go beyond the mechanisms visible to macroeconomic analysis. Every iteration of the loop deepens the disadvantage of those at the bottom of the distribution and widens the cognitive gap between them and those whose financial security protects their capacity for deliberate reasoning. This is not a counsel of despair - each link in the loop is a potential intervention point - but it is an argument against treating redistribution alone as a sufficient response to inequality. Our contribution is theoretical, and its formal propositions require empirical testing. Future research should develop measurable proxies for the SIFL's intervening variables - bandwidth depletion, tunneling intensity, capability endowment - to allow empirical estimation of the loop's transmission parameters across different institutional and policy contexts. Integration with longitudinal income data and experimental designs that manipulate financial slack would allow causal identification of the cognitive reproduction mechanisms the SIFL hypothesises. The ultimate ambition is a welfare economics that takes seriously not only what people have, but the cognitive freedom that determines how effectively they can use what they have.

Note: The article was elaborated within the Project selected in competition "Stimulating excellence in scientific research 2025-2026" 25.80012.0807.37SE "The perfection of instruments for reducing income inequality and reducing poverty of the population in the process of European integration of the Republic of Moldova", institutional funding, ANCD.

References:

1. Heckman, J.J., 2006. Skill formation and the economics of investing in disadvantaged children. *Science*, 312(5782), pp.1900–1902.
2. Kahneman, D., 2011. *Thinking, fast and slow.* Farrar, Straus and Giroux.
3. Mullainathan, S. and Shafir, E., 2013. *Scarcity: Why having too little means so much.* Henry Holt and Company.

4. Piketty, T., 2014. *Capital in the twenty-first century.* The Belknap Press of Harvard University Press.
5. Sen, A., 1999. *Development as freedom.* Oxford University Press.