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(to an optimal degree) is

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Inequality is not always a political choice, but reducing it (to an optimal degree) is

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Abstract

In a global context, per-capita income disparities between countries persistently widen, while internal income inequality in most nations continues to increase. Nobel Laureate Joseph Stiglitz argues that such inequality is a result of deliberate political decisions. However, inequality transcends mere political constructs, being influenced by natural and societal laws. For instance, research by Scheffer et al. reveals intriguing parallels between species abundance in the Amazon and human societal structures, while Fuchs and Thurner's study aligns inequality levels in the virtual economy of *Pardus* with those observed in Sweden and the United Kingdom, suggesting non-political factors in shaping inequality.

This multidisciplinary examination reveals that inequality is not solely a product of political choice. Economically, inequality can stimulate short-term growth through increased physical capital, such as savings. However, it also potentially reduces human capital and hinder long-term prosperity. Sociologically, inherited inequality is seen as unjust, yet the principle of fairness — rewarding greater effort — often trumps equality. Anthropologically, hunter-gatherer societies' egalitarianism diminished with increased production and the emergence of economic competition. Rogers et al.'s findings indicate an existential advantage in hierarchical societies over egalitarian ones. Thus, inequality is partly an outcome of natural and societal dynamics.

This study underscores the critical role of politics in managing inequality. In modern democracies, the political system is responsible for addressing free-market generated inequalities. This involves striving for an 'optimal inequality,' guided by models like the Boltzmann distribution, to balance stability and inclusiveness. Different distribution patterns can yield diverse societal happiness levels, even under similar inequality and external conditions. This study concludes that an ideal democracy supporting the less privileged enhances societal happiness. Nonetheless, efforts to mitigate inequality face challenges from democratic system flaws, ethical dilemmas, and information disparities between rich and poor.

Keywords: wealth inequality; socioeconomic inequality; optimal inequality, fairness

JEL: D63, P16, Z13

1. Is inequality always a political choice?

Striking disparities mar the global landscape across multiple dimensions, with income inequalities between nations persisting stubbornly (Deaton, 2014). Furthermore, the chasm in income distribution is widening within individual countries. Particularly striking is the wealth disparity in the United States, where substantial incomes can ultimately pave the way to immense fortunes, creating a dystopian scenario of inherited affluence and inactivity. Piketty and Saez's (2003) research, introducing the concept of 'patrimonial capitalism,' revitalizes the discussion, highlighting situations where wealth accumulation outpaces economic growth. This concept underscores a situation where the returns on wealth outpace the rate of economic growth, prompting serious questions about the inevitability of extreme inequality. In 'The Great Divide,' Nobel laureate economist Joseph Stiglitz (2015) presents a compelling analysis, arguing that inequality stems not from happenstance but deliberate political decisions. Stiglitz meticulously traces the historical transformations since the Industrial Revolution, demonstrating how policy choices have shaped inequality over time. His keen insights reveal that despite globalization's role in reducing global inequality, marginalized communities continue to grapple with enduring disadvantages. The United States stands out as a stark illustration of a nation where deliberate policies have exacerbated income and wealth inequality, disproportionately favouring the top percentile of society. Stiglitz's research underscores that the persistence of inequality is not solely an outcome of inevitable socioeconomic shifts but is fundamentally rooted in the intentional choices made within the realms of politics and economics (Stiglitz, 2013). His work thus serves as a clarion call, urging a reevaluation of these conscious decisions to forge a more equitable future.

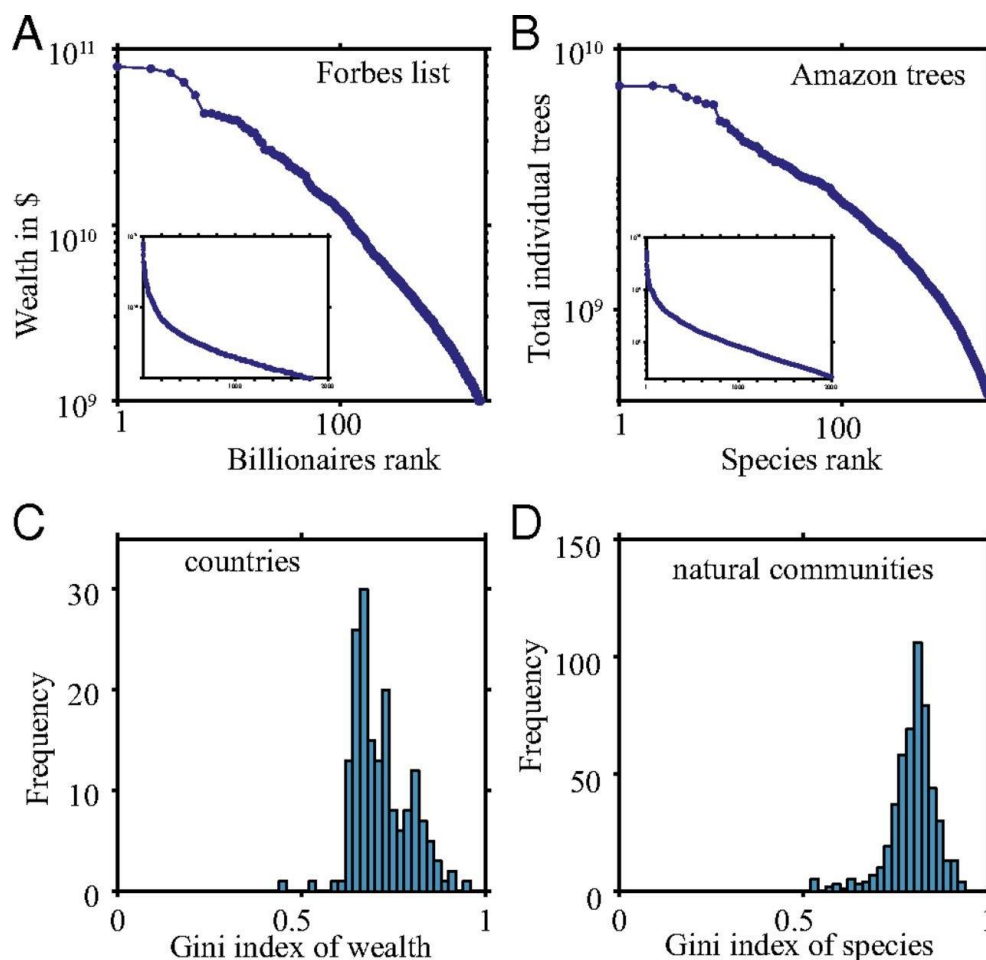


Figure 1. Inequality in society and nature

The Upper panels show how the wealth distribution of the world's 1,800 billionaires (A) is similar to the abundance distribution among the most common trees in the Amazon Forest (B). The Lower panels systematically compare inequality in nature and society by contrasting the Gini index of wealth in countries (C) with the Gini index of abundance in a large set of natural communities (D). Source: Scheffer et al. (2017)

While political decisions significantly influence inequality, especially in cases of extreme disparity, it is crucial to also consider the role of natural and social laws that transcend political control.. Inequality exists as a persistent characteristic in nature, affecting not just human societies but also natural ecosystems.. For instance, Scheffer et al. (2017) demonstrate this in their study by comparing wealth distribution in human societies with species abundance in the Amazon Forest., which examines inequality in a natural society devoid of human presence or influence (see Figure 1). According to their research, the distribution of abundance among the most prevalent species in the Amazon Forest exhibits parallelism with that observed in human society. Given that nature includes humans, it is conceivable to blame natural laws for some societal inequality. Moreover, the presence of indicators of inequality within a virtual society bears a striking resemblance to those observed in tangible societies, thereby offering supplementary evidence in favour of this assertion. The research conducted by Fuchs and Turner (2014) examines the phenomenon of inequality within the virtual economy of the

massively multiplayer online game Pardus. The present study employs a dataset comprising daily samples of player possessions, alliance affiliations, and networks of friendship and enmity. The virtual society in question can be perceived as a free-market capitalist society that operates under social regulations, with limited or absent state intervention. Notably, the patterns of inequality in Pardus strikingly mirror those in real-world economies like Sweden and the United Kingdom, suggesting inherent systemic factors at play. (see Figure 2). This evidence collectively implies that factors beyond political mechanisms — inherent in both natural and constructed systems — contribute to the persistence and nuances of inequality.

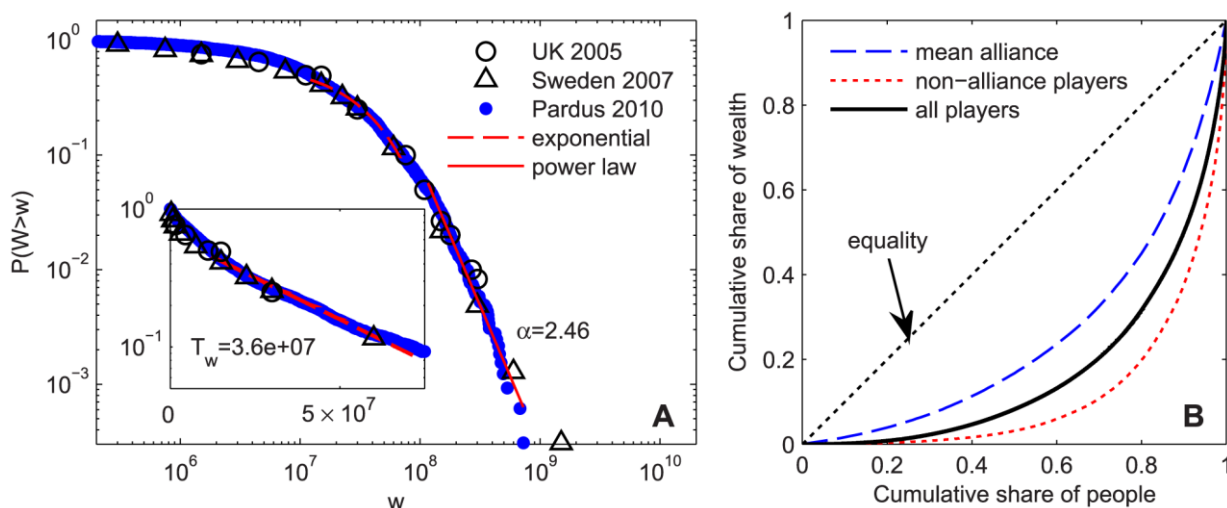


Figure 2. Wealth distribution of the massively multiplayer online game Pardus

Figure A shows cumulative wealth distributions for the United Kingdom, Sweden, and the massively multiplayer online game Pardus. It can be seen that the Cumulative wealth distributions of Pardus are similar to the United Kingdom, and Sweden. The Lorenz curve of wealth distributions in Pardus is shown in Figure B. Source: Fuchs and Thurner (2014)

2. When inequality is not a political choice

2.1. Economically, inequality is not always bad

Inequality is often perceived as a major barrier to a nation's progress in contemporary discourse. However, its complete eradication is impractical and, perhaps, economically undesirable. What then drives progressive governments to maintain a certain level of social inequality?

The persistence of inequality is not just a consequence of redistribution process flaws or political intentions. It also plays a crucial role in fostering positive economic outcomes. In the field of economics, it is worth noting that inequality can potentially have a positive impact on economic growth by means of the savings mechanism. Wealthier individuals often save a larger portion of their income, largely due to the higher returns achieved on less risky assets (Fagereng et al., 2020).

Bourguignon (1981) illustrates that the correlation between income levels and savings rates is not linear; the slope of this relationship steepens with increasing income. Considering that savings contribute to gross domestic product and recognizing that egalitarian societies do not necessarily generate more savings than unequal ones, it follows that rising inequality could paradoxically support economic growth. (see Figure 3).

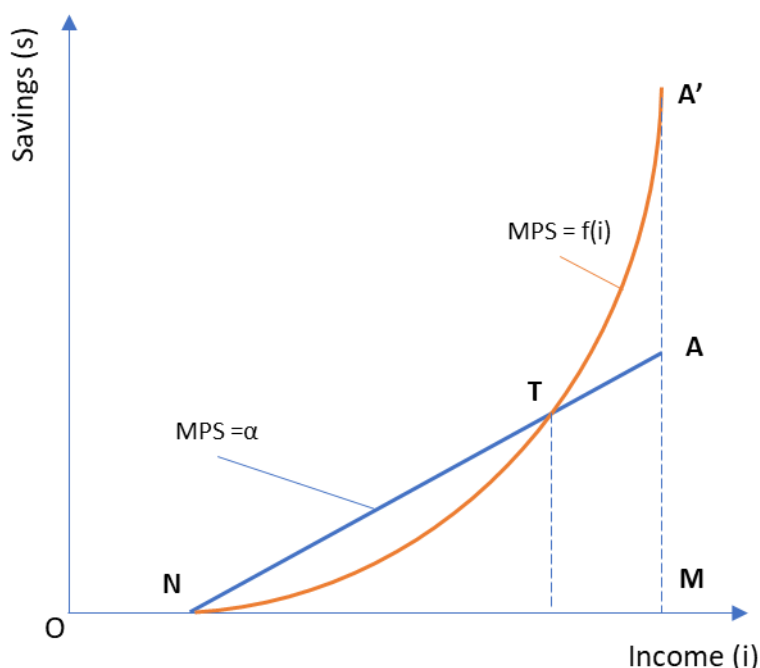


Figure 3. Marginal propensity to save (MPS) is concave, and Savings to GDP (growth)

Notes: When one reaches a certain level of income (the point N), (s)he begins to save. If MPS is constant (referring to line NA), inequality has no effect on growth. If MPS is a concave function of income (referring to the curve NA'), inequality encourages savings among the rich (the right side of T) rather than the poor (the left side of T) because their MPS is higher than the average ($MPS=\alpha$). One should note that total savings are the same in both cases (the area of NAM = the area of $NA'M$), so $MPS=\alpha$ is considered the mean value. Source: the author

While inequality can stimulate short-term economic growth by encouraging physical capital accumulation, economists caution against its long-term adverse effects, particularly in eroding human capital (Halter et al., 2014). According to the Unified Growth Theory, the primary drivers of economic growth – physical and human capital – are significantly influenced by the levels of inequality (Galor & Moav, 2004). Galor and Moav's (2004) study underscore that the relationship between inequality and economic growth varies depending on a nation's development stage, with factors like savings and domestic credits playing pivotal roles. In the initial stages of transitioning from economic stagnation to growth, prioritizing physical capital investment is essential for rapid advancement. However, as economies mature, the focus should shift towards nurturing human capital, especially through education, to ensure sustainable long-term growth. In summary, Figure 4 demonstrates that inequality's impact varies across different economic contexts. In developing nations, it can positively affect economic growth by

incentivizing savings among the wealthier segments of society. Conversely, in more affluent nations, excessive inequality often impedes the development of human capital, which can negatively impact long-term growth prospects.

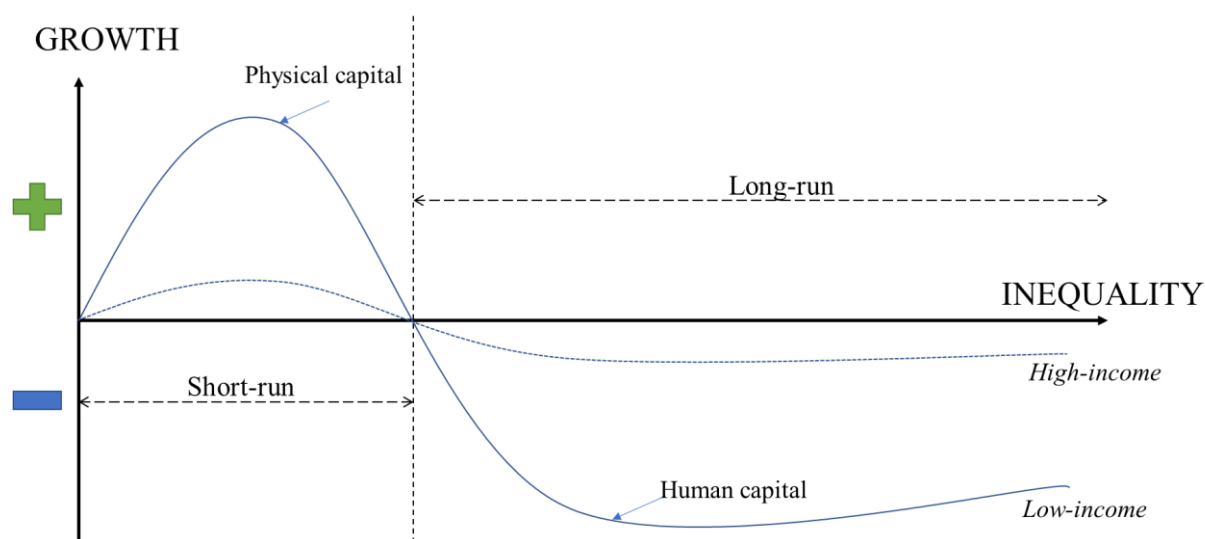


Figure 4. Short-run and long-run inequality effects on growth

Notes: In the short term, inequality significantly stimulates growth in economies that are heavily reliant on physical capital, typically found in developing countries. However, in economies where human capital is a primary driver (commonly in developed countries), the effects of inequality can be more complex and varied. Over the long term, both developed and developing nations are likely to experience negative impacts of inequality via the human capital channel. This adverse effect tends to be more pronounced in developing countries.

2.2. Sociologically, people prefer fair inequality

Prevailing beliefs suggest that heightened inequality intensifies the need for income redistribution in democratic societies and can fuel class conflicts in autocratic regimes. The prevailing assertions in these arguments presuppose that the general populace possesses a comprehensive comprehension of the magnitude of inequality and the significance of redistributing income. However, social research, including extensive transnational surveys, indicates that the general population often lacks awareness of the extent of inequality (refer to Figure 5). A notable finding is the frequency with which individuals underestimate the extent of national inequality (Hauser & Norton, 2017). These perceptions, accurate or not, significantly influence attitudes and behaviors concerning resource redistribution (Gimpelson & Treisman, 2018). Consequently, this factor may be identified as a significant contributor to the lack of success in utilising redistribution as an effective means of diminishing societal inequality. One of the fundamental factors contributing to this phenomenon is the perceptual discrepancy between the notions of fairness and inequality within societal contexts. When fairness and equality conflict, people often prioritize fairness, leading to a preference for 'fair inequality' over 'unfair equality' (Starmans et al., 2017). This distinction between perceived and actual inequality means that some level of inequality is generally regarded as justifiable (Lambert et al., 2003).

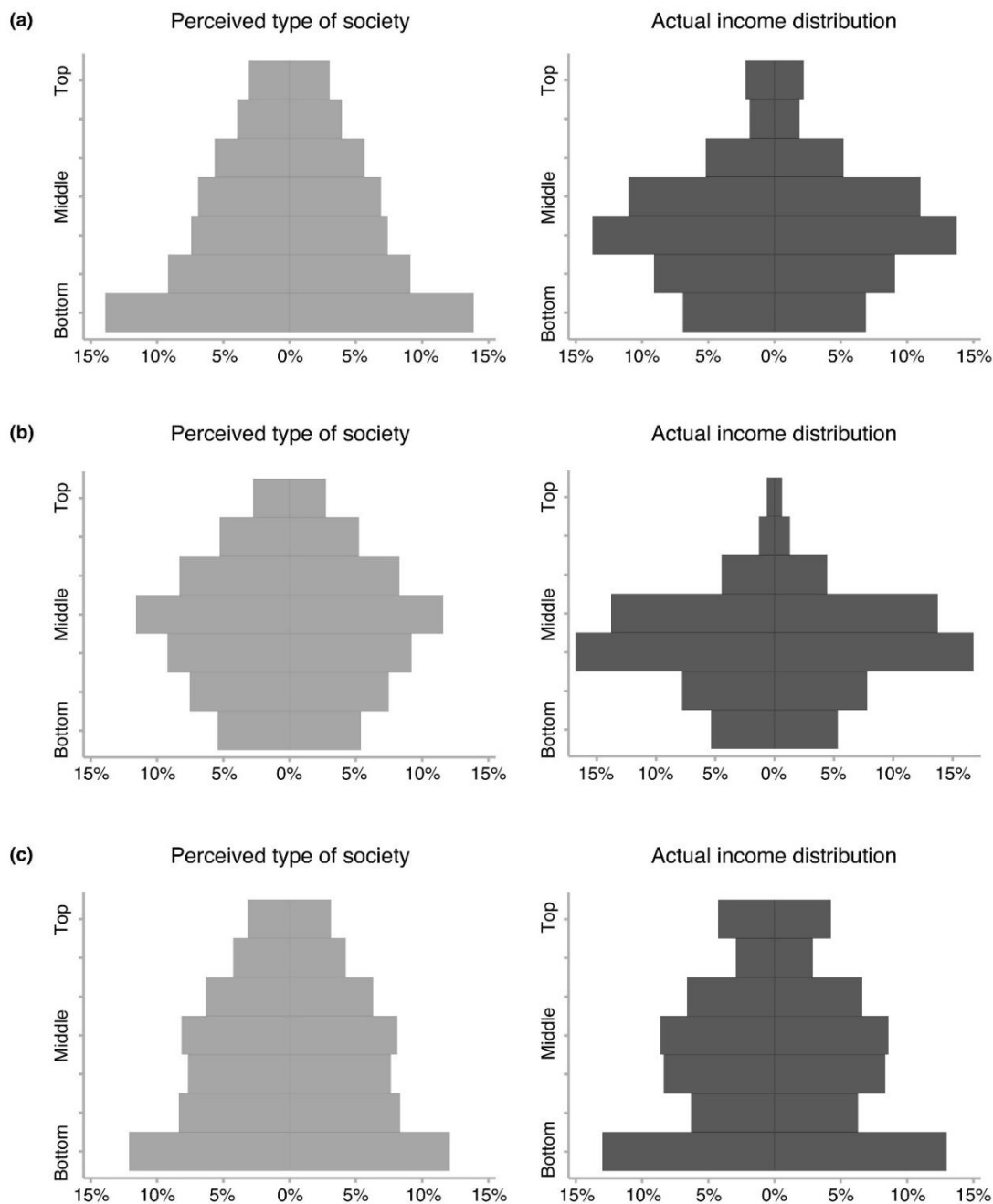


Figure 5. Misperceiving inequality across the world

Notes: Comparing perceived inequality to actual inequality, people overestimated in France (see figure a), underestimated in the US (see figure b), and well-estimated in Norway (see figure c). Source: Hauser and Norton (2017)

Fairness is commonly understood as the equitable remuneration for academic or professional efforts. It implies that wealth accrued through personal exertions is socially acknowledged and esteemed, with resultant inequalities often viewed as justifiable. However, a considerable number of individuals amass wealth through the inheritance of socioeconomic capital, which encompasses various forms such as assets, relationships, opportunities, and social status, bestowed upon them by their families, rather than starting from a position of limited resources. Instances of this nature are commonly perceived as being unjust (Rowlingson &

Connor, 2011). Public aversion generally targets inequality derived from inherited wealth rather than that stemming from personal effort or intellectual prowess. Moreover, there exists a diversity of perspectives regarding the sources of wealth among different social classes, which in turn contributes to a reluctance towards accepting or tolerating disparities in wealth distribution. The perception among young individuals from privileged backgrounds who belong to the white demographic is that meritocratic elements, such as diligence, drive, and educational attainment, hold the greatest sway in shaping economic outcomes. Conversely, older individuals from disadvantaged backgrounds who belong to minority groups tend to believe that non-meritocratic factors, such as inherited wealth and racial identity, exert the most substantial influence (Reynolds & Xian, 2014).

The concept of meritocracy, advocating for policies that promote equal opportunities and social mobility, underpins these discussions on fairness. Meritocratic principles are closely linked with the notion of free will. It is argued that imposing equality can sometimes limit individual autonomy by constraining choices and imposing external controls (Scanlon, 2018, pp. 95–116). Contemporary politicians often propose meritocratic ideals as a strategy to address inequality. However, this approach is sometimes criticized as perpetuating inequality within egalitarian societies (Millward-Hopkins, 2021). In communities where low-performers prefer equality and high-performers prefer inequality (Bratanova et al., 2016; Lenger et al., 2021), the disparity in meritocracy rewards (which is related to income inequality) fosters competition and innovation (Sánchez-Rodríguez et al., 2018). In societies marked by higher levels of inequality, there is a noticeable preference for competition over collaboration, reflecting the influence of inequality on social dynamics (Sánchez-Rodríguez et al., 2018)

2.3. Anthropologically, unequal societies prevail over equal ones

Anthropological studies reveal that the earliest forms of human society, namely hunter-gatherer groups, exhibited the highest levels of egalitarianism compared to later societal forms. In hunter-gatherer societies, equality was achieved through an immediate economy, characterized by limited savings and accumulation. This, in turn, restricted commercial activity and economic interdependence (Woodburn, 1982). A central hypothesis for the emergence of egalitarianism in these societies is the implementation of cultural norms that promoted equal sharing and cooperation (Boehm & Boehm, 2009). However, the non-competitive value systems of hunter-gatherer societies limited agricultural development due to sharing rules that restricted investments and savings during periods of rapid population growth and high demand for food. This often resulted in resource depletion, competition, and conflict. The shift occurred when increased agricultural production led to surplus creation. This surplus fostered a demand for

specialized roles in management and trade, gradually giving rise to distinct social classes (Carneiro, 1970).

Simple hunter-gatherer societies, characterized by limited food resources, low population densities, and nomadic lifestyles, tend to exhibit less hierarchical structures with weak property rights and a strong ethic of sharing. In contrast, hierarchical societies, which typically have superior resources and higher population densities, engage in more intense economic competition due to production competition and the commercialization of surpluses (Hayden, 2001). Although economic competition has been shown to be a manifestation of unequal societies, scientific evidence demonstrates that inequalities can persist in cases of economic cooperation in the presence of specialization and trade. This is the result of cultural learning, which occurs when people tend to learn from those who are more economically successful, thereby disseminating cultural knowledge that promotes economic success. These processes can generate a stable, culturally transmissible division of labour. This type of social stratification is preferred because it generates more surplus value and distributes it more equitably when there is greater specialization and economic success is highly regarded by society (Henrich & Boyd, 2008). Stratified societies, with their distinct social classes, have demonstrated a competitive advantage in adapting to natural resources and environmental changes. Unequal access to resources, while potentially destabilizing in constant environments, can provide resilience in changing conditions by concentrating mortality in lower classes (Rogers et al., 2011). Consequently, unequal societies often have an advantage over more egalitarian societies, given their ability to adapt and respond to a variety of circumstances.

2.4. Philosophically, human is biosocial

In the realm of examining inequality, economists may adopt a perspective that centres around interests, sociologists may adopt a perspective that centres around fairness, and anthropologists may adopt a perspective that centres around social norms and cultures. In a similar vein, philosophers may approach the study of inequality through the lens of dialectical materialism, also known as the concept of 'human is biosocial' (1983). As a human factor, inequality is inevitably influenced by both natural and social forces. Philosophically, this dual influence reflects the concept that humans are biosocial beings, intertwined with nature while simultaneously shaped by societal constructs. For the former, it is argued that inequality is formed in human society similar to the natural world because man derives a portion of his essence from nature, while for the latter, inequality is moderated by societal factors, such as institutions. This philosophical stance aligns with multidisciplinary research findings. For instance, Scheffer et al. (2017) observed parallels between human society's wealth distribution and the abundance distribution of tree species in the Amazon rainforest. Similarly, Fuchs and Turner (2014)

highlighted socio-political factors influencing wealth distribution in the virtual world of the Pardus game.

In addition to the inherent characteristics of nature and society that have long-term effects on the level of income inequality, there are also short-term factors that need to be discussed, such as luck (such as winning the lottery) and life-altering opportunities (like the chance to get a scholarship). Luck represents an uncontrollable natural factor, whereas the equality of opportunity, a cornerstone in the principle of fairness, is a human factor subject to societal influence. The transformation from natural difference to societal inequality often occurs when individuals perceive themselves as inferior within the societal hierarchy (Scanlon, 2018). It is a natural difference (which includes everything when a person is born) that causes a social difference, and through a lens (or a scale formed on contemporary society's rules and norms), it transforms into a comparable value, and thus inequality is born. According to John Rawls (1999), while natural differences are inevitable, society requires a principle of fair division. He advocates not for equal redistribution, but for a proportionate sharing of resources based on individual contributions, fostering increased productivity while ensuring the basic needs of the most vulnerable are met.

3. Reducing inequality is political

3.1. To what degree should inequality be reduced?

While the rise in inequality is partly a result of political decisions, its origins extend beyond just political factors. Inequality is also shaped by natural and social laws, making its reduction a complex issue. Economically, some argue that a degree of inequality is essential, as it can stimulate short-term growth. Socially, the concept of fair inequality – the preference for a system that rewards effort and ability – justifies some level of disparity between social classes. Inequality is also viewed as a necessary component in social evolution, providing existential advantages by encouraging competition and innovation. Furthermore, the enduring nature of inequality is influenced, in part, by natural forces beyond human control. While the political system cannot be solely blamed for rising inequality, it bears the responsibility to mitigate it. The challenge lies in determining the optimal level of inequality that balances social justice with economic growth. The pivotal question, then, is what constitutes the optimal degree of inequality. Identifying the appropriate principles for reducing inequality, especially when neither perfect nor proportional equality seems suitable, is a complex yet essential endeavor.

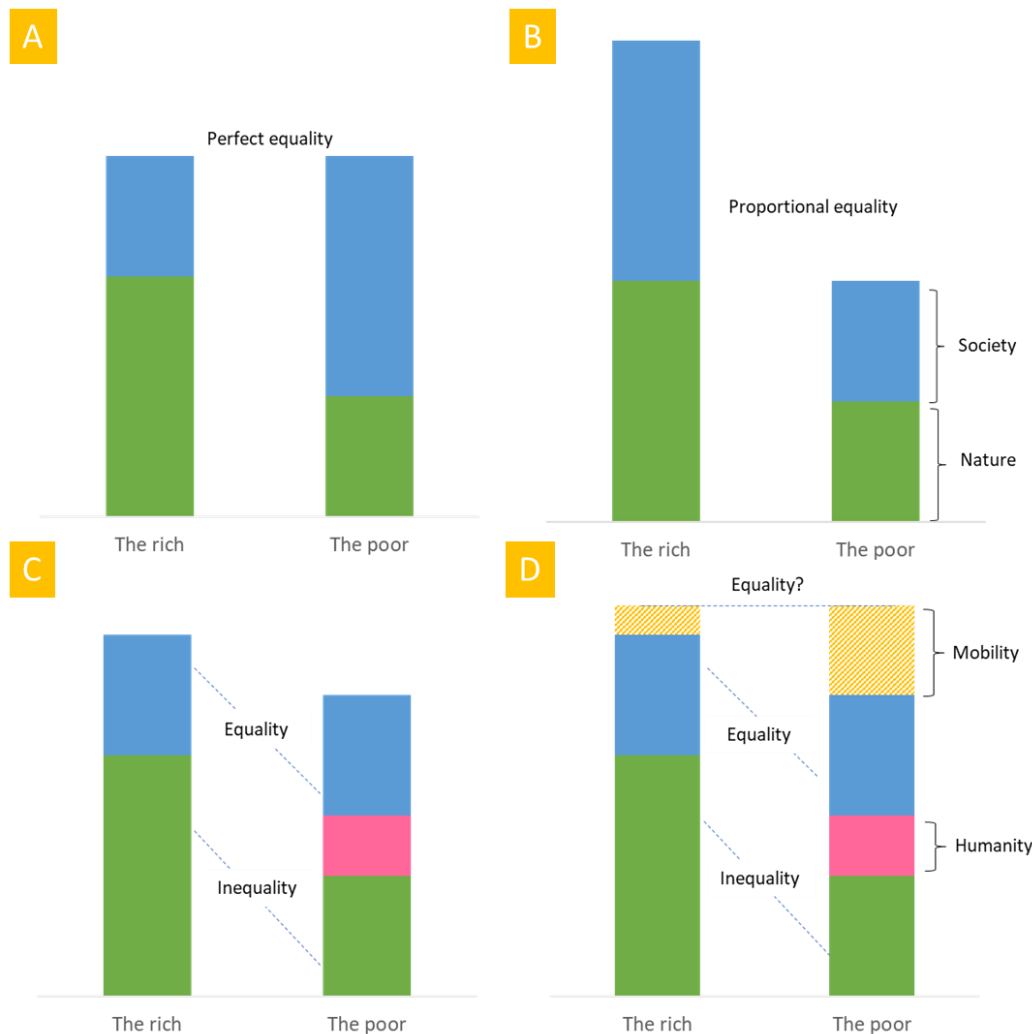


Figure 6. Is perfect equality feasible?

Notes: Figure A illustrates a scenario of perfect equality, where income and wealth are evenly distributed across society. In contrast, Figure B depicts proportional equality, where distribution aligns with societal hierarchies or contributions. In response to societal imbalances, radical income redistribution policies, as represented in Figure A, aim to establish an equitable social model. However, such policies can raise concerns about fairness, especially when contributions or talents do not correspond proportionally to income or benefits. Figure C illustrates natural inequality, an inherent aspect of society that persists despite charity or humanitarian efforts. This underscores the limitations of societal attempts to ensure absolute equality. Figure D suggests that in a society championing equal opportunity for all, empowering the disadvantaged, particularly through enhancing their social mobility, is a more effective means of achieving equality. This approach values the intrinsic capabilities and philosophical consciousness of individuals. Source: the author

From a moral standpoint, natural inequality, being beyond human control, should not be the responsibility of the state, a social construct. Therefore, the political system should be accountable primarily for inequalities arising from social forces. However, natural inequalities can be mitigated through humanitarian actions. Such policies, whether aiding those in harsh natural conditions or being inclusive of people with disabilities, serve to alleviate inequality aversion, though they cannot completely eradicate inequality (see Figure 6C). One of the commonly acceptable approaches is meritocracy, which is closely related to equality of opportunity and social mobility. Philosophically, if all the aforementioned factors (natural forces,

social forces, and humanity) impact the philosophical matter of people who experience inequality, then meritocracy or mobility stems from their consciousness (inner strength of a person). Therefore, although matter determines consciousness, consciousness can also influence matter in return (Spirkin, 1983). As shown in Figure 6D, whether (perfect) equality is achieved lies in the will of people in the lower classes of society to rise up in a context where social resources are perfectly equally divided. According to this principle (hereinafter referred to as satisfactory equality), the responsibility of the political system lies only in reducing inequality from normal inequality (of the free-market society) to optimal inequality (of the welfare-satisfied society), as discussed below.

Inequality in human societies is measured along a spectrum, ranging from perfect equality (Gini coefficient = 0) to extreme inequality (Gini coefficient = 1), as depicted by the Lorenz Curve. However, achieving perfect equality is practically unfeasible, as evidenced by the feasible equality levels estimated in various countries by Park and Kim (2021). Inequality is frequently associated with a negative connotation, and since achieving (perfect) equality is unattainable, societies are frequently assessed using a negatively skewed metric rather than an objective measure of income distribution. A more appropriate measure might be a subjective inequality index, like the Atkinson index. This index functions as a measure of social welfare, factoring in the development of the inequality aversion parameter (Atkinson, 1970). Lambert et al. (2003), through mathematical analysis, posit the existence of a 'natural rate' of subjective inequality. This rate represents a level of inequality that societies universally perceive and tolerate among their citizens. These findings lend support to the fair inequality hypothesis, suggesting that societal acceptance of a certain level of inequality is not only inevitable but also potentially conducive to social welfare.

Utilizing the principle of fair division, Park and Kim (2021) identify a level of feasible, or 'optimal', inequality in countries, aimed at maximizing total social welfare. Accordingly, fair income distribution is calculated using the Boltzmann distribution, an entropy-based method – comparable to Atkinson's (1970) method for calculating the subjective inequality index. The Boltzmann fair distribution, based on the principle of maximum entropy (or social welfare), constrains factors like human emotions, irrational decisions, and deceptive behavior. In this model, the Boltzmann probability determines economic shares (Park et al., 2022). This method aligns with the concept of social equality under the 'satisfactory equality' principle, marking the upper limit of inequality that a political system should be held accountable for. Conversely, the lower limit of political responsibility, as per the 'satisfactory equality' principle, is reflected in the 'normal inequality' found in virtual worlds like the one studied by Fuchs and Thurner (2014). This level of inequality occurs without state intervention and is quantified as $G = 0.65$,

intriguingly close to the Gini index of the variance in the Gaussian distribution (0.636) as identified by Bénasséni (2013).

The concepts of 'normal' and 'optimal' inequality represent distinct approaches to fair division. While the former focuses on maximizing the use of social resources (according to capitalists) in order to maximize productivity, the latter focuses on maximizing social welfare (according to the Boltzmann division) in order to minimize the degree of inequality aversion. While the former often overlook the humanitarian issue of vulnerable people in society (such as children, the elderly, and the disabled), the latter embraces Rawls' principle of difference regarding meeting the basic needs of all members of society. Furthermore, two other principles of fair distribution warrant consideration. Egalitarianism advocates for equal sharing of economic benefits among all society members, while the socialist approach, rooted in Marxism, proposes division based on individual needs. However, both perspectives may disregard the importance of individual contributions to society, potentially discouraging productivity growth and hindering societal development (Velasquez, 2002).

3.2. Does the pattern of income distribution matter?

While indicators like normal or optimal inequality primarily focus on the level of income inequality, the pattern of income distribution also plays a critical role, albeit often receiving less attention. This leads to the question: does the pattern of income distribution significantly affect societal happiness? Concerning objections to inequality, Scanlon (2019) assumes two societies with the same level of inequality and two income classes: society A with 1% of the population richer than the rest, and society B with 1% of the population poorer than the rest. Under these conditions, society A may be perceived as happier than society B. This is because the minority affluent group in A feels a sense of superiority in accordance with social norms, whereas the minority poor in B experiences a sense of inferiority. In both societies, the majority may view this 1% as an anomaly rather than a standard for comparison. This raises the question: what underlying factors differentiate these societies in terms of societal happiness and perceptions of inequality?

Adapting Scanlon's assumption to a Cartesian coordinate system, we compared multiple patterns of income distribution having the same Gini index with only two income classes (see Figure 7). Under the assumption of uniform income within each class, we have two linear lines (according to the cumulative share of the Lorenz curve) representing the two social classes: the poor (the left line) and the rich (the right line), with the intersection of these two lines being numbered for reference, as shown in Figure 7 below. In light of this, we compare the distribution patterns of three distinct societies S1, S2, and S3 with the same Gini index (when the three points

are located on the same line). For assessing the societal structures, we propose two criteria: 'aversion,' which refers to the income disparity between the rich and the poor, and 'democracy for the poor,' which indicates the extent to which the political system empowers the economically disadvantaged groups in decision-making processes. This criterion assesses how effectively a society's political framework allows its poorer segments to influence policies that directly affect their welfare and opportunities.

Box 1. Cartesian coordinate system and Gini index

Let $A(x, y)$ in the triangle OIP: $\begin{cases} 0 < x, y < 1 \\ x - y > 0 \end{cases}$

We have the area of OIA:

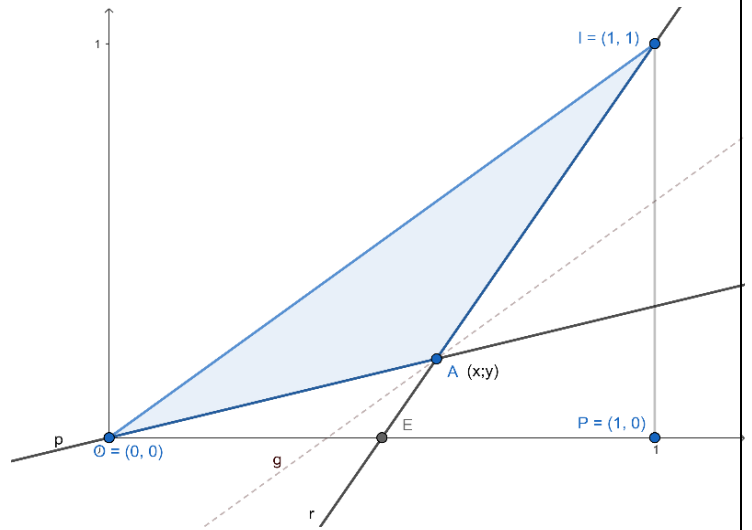
$$S_{OIA} = \frac{x - y}{2} = \frac{Gini}{2}$$

Set a line that goes through A and parallels with the perfect line that passes through O and I; we have the line g : $x - y = Gini$; and every point in this line has the same Gini.

The line p , through O and A, represents the cumulative income of the poor, and vice versa, the line r , through A and I, for the rich.

The slope coefficients of lines r and p measure the uniform income levels of the rich and the poor, and their difference is calculated as follows:

$$D = \frac{1 - y}{1 - x} - \frac{y}{x} = \frac{x - y}{(1 - x)x}$$



For the case that Gini remains constant (or A lies in the line g):

$$D = \frac{x - y}{(1 - x)x} = \frac{Gini}{(1 - x)x} = \frac{Gini}{f(x)}$$

$$D_{min} \Leftrightarrow f(x)_{max} \Leftrightarrow x = 0.5$$

Accordingly, as demonstrated in Box 1, the degree of aversion gradually increases on either side of S2 (where the poor and rich populations are the same), and democracy begins to acquire a positive value as the intersection point moves from S2 to the right end (when the number of the poor is greater than the number of the rich). Although S1, S2, and S3 share the same Gini index, their societal desirability varies. S1 is less preferred due to the lack of political voice for the poor (negative 'democracy for the poor') and a wider income gap. In S2, the income gap is narrower, but the poor still lack political influence ('democracy for the poor' = 0). S3 emerges as the most favorable pattern, as the greater political voice for the poor (higher 'democracy for the poor') can facilitate redistribution policies, despite a larger income disparity compared to S2. As a result, distribution patterns similar to S3 are most common in real-world scenarios and in models estimating optimal inequality (Park & Kim, 2021). This outcome is

additionally in line with social survey results on inequality aversion, which show that high-performers (typically high-income people) prefer an unequal society, whereas low-performers (typically low-income people) prefer a more egalitarian society (Lenger et al., 2021).

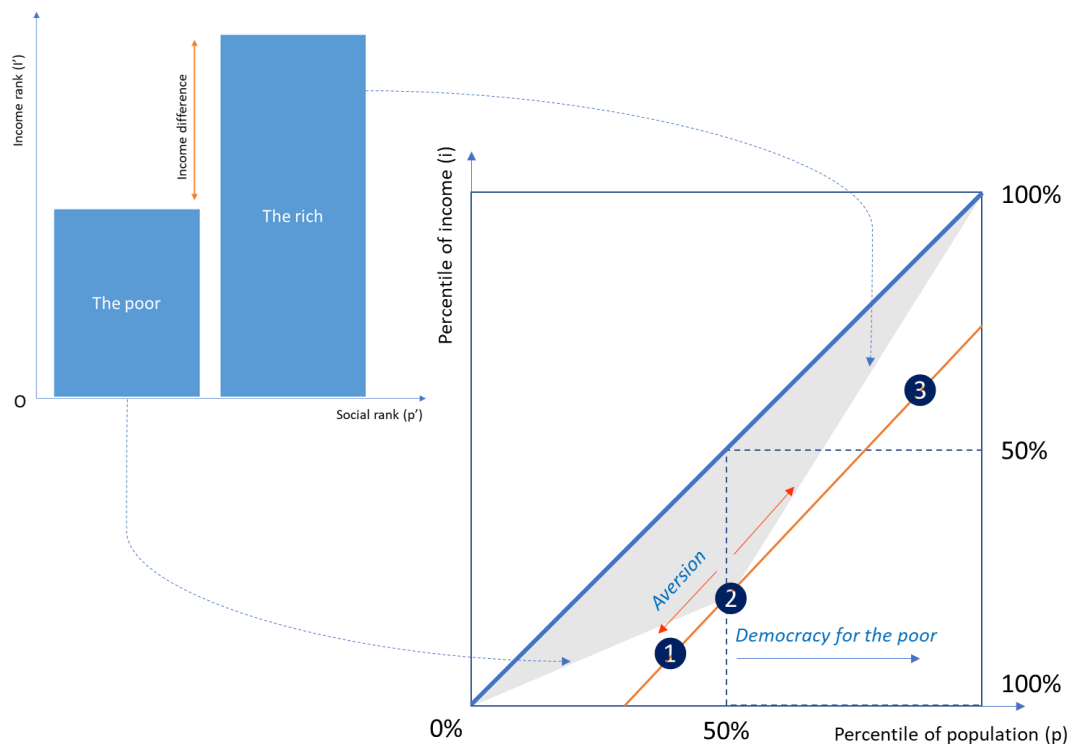


Figure 7. How does democracy matter?

Notes: The figure illustrates patterns (points 1, 2, and 3) for a given level of income inequality in a society assumed to have only two income classes - rich and poor. Pattern 2, according to Box 1, has the smallest income gap, corresponding to the lowest level of aversion. Pattern 3 has a greater degree of aversion, yet democracy allows the poor to vote on policies that favour them. Pattern 1 is not beneficial for the poor, who have a significantly lower income than the rich (relative to Pattern 2) and have no political voice (compared to Pattern 3). Source: The author.

The analytical model previously discussed operates on the premise that in a democracy, each society member possesses equal voting rights. This foundational assumption is crucial in understanding the dynamics of inequality reduction in democratic systems. In contrast, in societies characterized by slavery or feudalism, inequality may exceed the norm; in such scenarios, the political system is not the saviour of inequality but rather its root cause; or societies that have not yet achieved democracy may have inequality levels that exceed normal inequality, for instance, Namibia's post-tax Gini index was greater than 0.65 during its newly liberated period (as per data from the Standardized World Income Inequality Database), when its wealth-equalizing institutions had not had a timely effect (Lawson, 2017). While democracy can facilitate inequality reduction, it is neither the sole nor a decisive factor in this process (Scheve & Stasavage, 2017). Furthermore, democracy's effectiveness can be compromised when wealthy elites exert indirect control over politics, often through financial influence (Acemoglu & Robinson, 2005). The question arises whether an egalitarian can be wealthy and whether wealthy

elites who advocate for equality are acting against their own interests (Cohen, 2000). Moreover, it is uncertain whether efforts to reduce inequality can be considered fair, given the fact that self-centeredness and self-interest are inherent to human nature. Even if these efforts are successful, it is not clear whether they stem from a genuine commitment to democratic principles or if they are simply a form of benevolent paternalism aimed at trickling down benefits to the broader society. In addition to technical errors (such as measurement errors or geographical constraints), the process of reducing inequality can be hampered by such ethical concerns. Additionally, the poor may have misconceptions about the actual extent of inequality in their society, leading to political decisions that may not align with their best interests (Gimpelson & Treisman, 2018). In conclusion, the pursuit of reducing inequality, as per the satisfactory equality principle, encounters challenges at various levels – including the imperfections in democratic processes, ethical dilemmas, and disparities in information access.

4. Conclusion

Inequality remains a pervasive issue globally, manifesting through persistent disparities in per-capita income between countries and widening internal income gaps within nations (Deaton, 2014). While some view this inequality as inevitable, others, such as Nobel laureate Joseph Stiglitz, argue that it is the outcome of intentional political decisions (Stiglitz, 2013). Although political decisions significantly influence inequality, natural and social laws beyond political control also contribute. Inequality is a constant feature in nature, including human society. A study by Scheffer et al. (2017) discovered that the distribution of abundance among species in the Amazon Forest mirrors that in human society. Similarly, Fuchs and Thurner (2014)'s research on the virtual economy of the online game *Pardus* found levels of inequality comparable to those in countries like Sweden and the UK. These findings imply that factors beyond political control may contribute to inequality.

Further, a multidisciplinary analysis reveals that the roots of inequality extend beyond deliberate political decisions. This complexity is evident in the varying impacts of inequality across different fields. From an economic standpoint, while inequality can boost short-term growth through increased physical capital accumulation (Bourguignon, 1981), it potentially hampers long-term growth by diminishing human capital (Galor & Moav, 2004). In sociology, inherited socioeconomic inequality is often perceived as unjust. This refers to the principle of fairness, which is frequently confused with the concept of equality: those who are superior and exert more effort deserve greater success than those who are inferior and exert less effort. Generally, when fairness and equality are in conflict, people prioritise fairness (Starmans et al., 2017). In the field of anthropology, hunter-gatherer societies once achieved a high degree of

equality; however, as production levels increased and economic competition and cooperation emerged, they were gradually replaced by unequal societies. Anthropological evidence indicates that hierarchical social forms always have an existential advantage over egalitarian societies (Rogers et al., 2011). In philosophy, inequality is subject to both natural and social forces (1983); therefore, inequality is not the result of human choice alone.

This study posits that politics plays a crucial role in mitigating inequality to an ideal level. In the framework of a contemporary democratic society, the minimal obligation of the political system is to manage the inherent inequality produced by free-market mechanisms. This is gauged by the inequality index of a hypothetical world where all societal members can compete freely based on their capabilities, without state interference or concerns about human welfare or social issues. Conversely, the maximum duty of the political system is to attain an optimal level of inequality for the greatest social welfare, as per the Boltzmann distribution. The objective of politics in reducing inequality is to ensure societal stability and inclusivity. Beyond the optimal level of inequality, the pattern of income distribution holds equal importance, as different patterns can significantly influence societal happiness levels, independent of the degree of inequality. The analysis conducted in this study indicates that a perfect democracy that benefits the less wealthy leads to a more satisfied society. It should also be noted that efforts to reduce inequality may be hampered by democratic system flaws, ethical dilemmas, and a rich-poor information gap.

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