Individual Morality and Inequality: Public Goods and the Political Support for Redistribution[*]

Santiago López-Cantor[†]

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Individual morality serves as a key driver of actions that often come at the expense of personal utility, particularly when contributing to public goods or fighting public bads. However, its influence on other decision-making domains, such as voting, remains largely unexplored. This paper studies the impact of individual morality on political support for public policies and its corresponding effect on the distribution of outcomes. I compare the political equilibrium of two societies: one composed of agents with moral considerations regarding the provision of a public good and the other consisting of agents who lack such considerations. Taxation finances two public policies: a redistributive transfer and an investment in the public good. Moral agents voluntarily contribute to the public good, leading to a higher and constrained Pareto-efficient provision. Since voluntary contributions satisfy the social demand for the public good, these agents prefer a lower tax rate, which they allocate entirely to redistribution. In contrast, in the non-moral society, agents rely on taxation to fund the public good and therefore vote for higher tax rates, which crowd out voluntary contributions. This behavioral and political mechanism has clear distributive implications. In the moral society, lower taxes imply smaller fiscal transfers to low-income agents. When ex-ante inequality is high or preferences for the public good are weak, this reduction in redistribution decreases the private consumption of poorer agents and increases ex-post inequality in disposable income, consumption, and utility. Thus, while morality enhances efficiency and raises the overall level of public-good provision, it can also widen disparities across agents by shifting the burden of collective provision from the State to individuals. Monte Carlo simulations using pretax income data from the World Inequality Database confirm the theoretical results and quantify the effects in terms of probabilities.

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[†]Aix-Marseille Univ., CNRS, AMSE, Marseille, France. santiago-alejandro.lopez-cantor@univ-amu.fr

1 Introduction

The provision of public goods has long been a central topic in economic research, with extensive attention devoted to the determinants of both public and private provision (Bowen, 1943; Bergstrom, 1979; Slavov, 2014; Sugden, 1984; Bergstrom et al., 1985; Andreoni, 1990). However, much less is known about how the motives behind voluntary contributions influence individuals' political preferences over taxation and redistribution. A growing body of evidence suggests that moral considerations—a sense of ethical duty, universalism, or concern for the common good—are the primary drivers of voluntary contributions, motivating individuals to act even at a personal cost (Brekke et al., 2003; Bos et al., 2020; Dal Bó and Dal Bó, 2014). Individuals internalize part of the social externality associated with their actions: they contribute not because of direct material benefits but because they perceive doing so as morally right. This moral internalization changes how individuals view the role of government in providing public goods, affecting their political support for taxation and redistribution. Understanding how morality shapes these political preferences is essential for analyzing how it ultimately influences the distribution of outcomes in a society.

In this paper, I study the impact of individual morality towards a public good, conceptualized along Kantian lines, on political support for public policies and on the resulting distribution of economic outcomes. Kantian morality functions as a social rule, stipulating that contributions to the public good should be morally appropriate if universally adopted. In other words, when choosing their contributions, agents assume that all others make morally equivalent contributions given their own situation. I develop a political-economy model comparing two societies that are identical in every respect—population, preferences, income distribution, tax system, and electoral process—except for the moral framework guiding behavior. In one society, agents behave in a self-interested manner without moral considerations, making decisions solely based on traditional economic incentives. In the other society, agents incorporate moral considerations when choosing their voluntary contributions to the public good and adhere to a Kantian maxim that defines their contributions as morally appropriate actions if universally adopted. Recent literature has shown that moral and pro-social motives are context dependent (Bénabou et al., 2024; Bolton and Ockenfels, 2000). Consequently, morality is limited to the scope of voluntary contributions to the public good and does not affect other decisions concerning private consumption or voting.

Apart from private contributions, agents vote on two key public policies: a redistributive policy in the form of a lump-sum transfer and a public investment in a public good, both funded through proportional taxation. Taxation is distortive, implying a trade-off between the goals of public policies and the deadweight loss associated with funding them. I explore how the endogenous determination of both the tax rate and the allocation of the public budget between these policies interacts with agents' moral frameworks.

The main result of this paper is that individual morality towards a public good can generate an efficiency-equity trade-off. In societies where ex-ante inequality is high and preferences for the public good are low, individual morality towards a public good is associated with lower private consumption by low-income agents and greater ex-post inequality in disposable income, private consumption, and utility. Although morality does not directly shape voting choices, it nonetheless influences electoral outcomes indirectly by altering agents' optimal voluntary contributions to the public good. When agents lack moral considerations, they face incentives to free-ride on the contributions of others, resulting in the under-provision of the public good. Consequently, the median voter may support higher tax rates that compel all agents to contribute to the public good, even at the expense of an efficiency loss. In contrast, when agents have moral considerations, voluntary contributions to the public good ensure a higher and constrained Pareto-efficient provision.[1] However, since taxation incurs an implicit deadweight loss, moral agents tend to prefer lower tax rates. This disparity in equilibrium policy parameters influences the ex-post distribution of outcomes and may exacerbate poverty and inequality in societies with moral considerations for the public good.

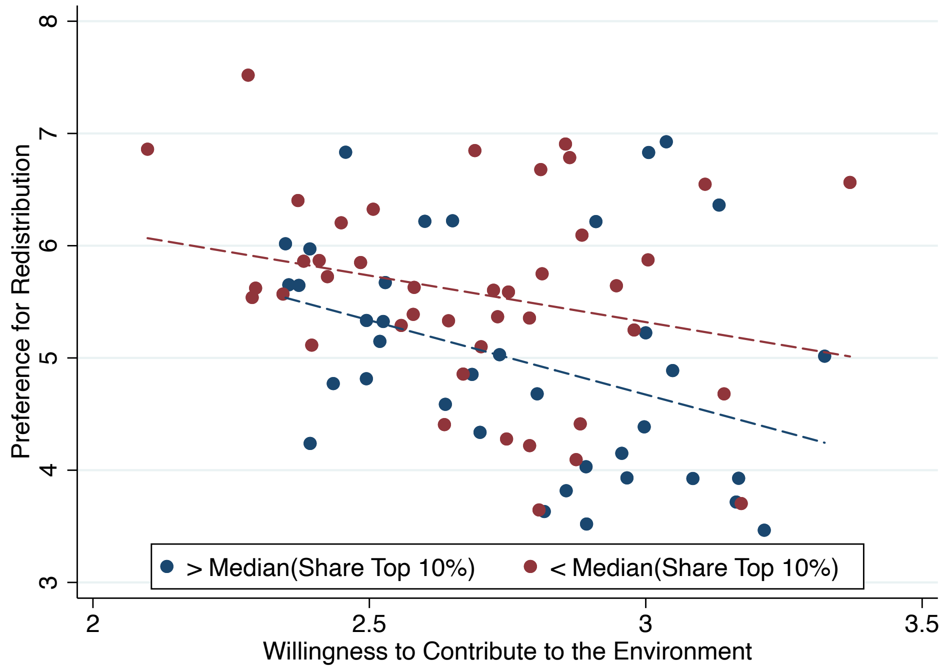
Using data on pre-tax national income for 193 countries, I conducted Monte Carlo simulations to estimate the probability of higher inequality in societies with moral considerations. The simulated variables are the median-to-mean ratio and the preferences of agents regarding private and public good consumption. In the most conservative scenario, this probability is estimated at 34.3% for the entire sample of countries and at 54.3% for the subset of countries exhibiting the highest levels of pre-tax income inequality. Survey data support the negative relationship between moral considerations regarding public goods and redistributive preferences. Figure 1 illustrates a negative correlation between the willingness to contribute to fighting environmental pollution and preferences for redistribution. Moreover, pre-existing inequality amplifies the magnitude of this negative relationship, as evidenced by the steeper trend in countries with a larger concentration of pre-tax income.

When agents lack moral considerations, they tend to favor higher tax rates that primarily finance public good investments. In contrast, agents with moral considerations opt for lower tax rates that exclusively support the redistributive policy. One might think that morality will, in addition to increasing public good provision, reduce inequality, as the entire public budget is allocated to fund a lump-sum transfer. However, this underscores a fundamental trade-off: while individual morality leads to what is considered the constrained Pareto-efficient public good level, it also exerts downward pressure on taxation, and compels low-income agents to contribute, which can lead to greater ex post inequality in disposable income, private consumption, and utility. This phenomenon occurs in societies characterized by higher ex-ante inequality and a low preference for public goods.

The mechanism is as follows: a higher ex-ante inequality increases the tax rate in both societies. However, because moral agents can provide the public good privately, the increase in the tax rate is lower. As the tax is proportional, a lower tax implies less redistribution. Moreover, higher inequality also increases the share of the budget devoted to the redistributive policy in the society without morality, reducing further inequality. This does not occur in the moral society, as the entire budget is already used for the redistributive policy in equilibrium. With lower preferences for the public good, agents lacking moral considerations divert resources from public good investment to the redistributive policy, thereby further reducing inequality. In

[1] Constrained Pareto-efficiency relates to the optimal provision of the public good that fulfills the Samuelson Rule (Samuelson, 1954), given the deadweight loss of taxation.

Figure 1: Willingness to Contribute to the Environment vs. Preferences for Redistribution (2004 - 2010)



Notes: Figure 1 uses data from the last wave where the relevant questions were asked (2004-2010) and plots the average of the willingness to contribute to the environment per country – measured with question B001 of the survey – against the preference for redistribution – measured with question E035 of the survey – for 78 countries, and shows an overall decreasing relationship that worsens for countries with higher pre-tax income concentration, measured by the share of overall income captured by the top 10% of earners. See Appendix A for details on the computation and for other public-good-morality proxies that still show this negative correlation with redistributive preferences. *Source:* Own elaboration with data from the Integrated Value Survey merging World Value Survey and the European Value Survey (1981-2022) and the World Inequality Database (1989-2023).

a society with morality this shift cannot occur through policies, as the entire budget already finances the redistributive policy. Reallocation instead occurs through a decrease in contributions to the public good; given that these contributions are proportional, high-income agents gain more in private consumption than low-income agents do. As a result, more unequal societies with lower taste for the public good tend to have higher ex-post inequality when agents have moral considerations towards the public good.

I contribute to the literature on the voluntary provision of public goods by extending its focus beyond the efficiency of public good provision to the distributional consequences of morally motivated behavior. Samuelson (1954) formalized the efficiency conditions for public good provision and the free-rider problem, while Bergstrom et al. (1985) analyzed voluntary contributions in a Nash framework, showing that they fall short of the social optimum. Andreoni (1988) further enriched the discussion by investigating the limitations of altruism in the private provision of public goods, thus illustrating how individual behavior diverges from socially desirable outcomes and emphasizing the necessity of including other non-altruistic motives to explain voluntary contributions to public goods. Sugden (1982, 1984) argued that observed patterns of charitable giving were inconsistent with the Nashian framework and instead introduced a theory of reciprocity, where individuals contribute out of a moral sense that free riding is wrong and that one ought to match the contributions of others. My contribution to this strand is to connect these foundational insights to a political economy dimension: I show that moral motives that enhance voluntary provision can, through voting, reduce redistribution and increase inequality. Thus, I extend the voluntary-contribution literature to the domain of political equilibria and distributive outcomes.

The paper also contributes to the literature on morality and Kantian behavior in economics. Kant (1785)'s formulation of the categorical imperative broadly states that an action is morally right if its universalization is desirable. In economics, this insight has generated two complementary strands of research. The *preference evolution strand* (Alger and Weibull, 2013, 2016) shows that moral preferences mixing self-interest with universalization can be evolutionarily stable. This strand focuses on integrating Kantian motives into preferences and studying their implications for evolutionary stability. The *optimization strand* embeds Kantian reasoning into individual decision problems, replacing Nash conjectures with a universalizing criterion (Laffont, 1975; Bordignon, 1990, 1993; Bilodeau and Gravel, 2004; Roemer, 2010). My contribution to this literature is to embed Kantian reasoning regarding a public good within a political economy model, thereby allowing morality to directly shape individual contributions and indirectly influence collective policy choices. By doing so, I demonstrate that Kantian morality—conceptualized as the universalization of contribution rules—can generate a novel efficiency–equity trade-off at the aggregate level.

Furthermore, this paper contributes to the literature on the political support for public policies. Classic models such as Bowen (1943) and Bergstrom (1979) analyze voting over public good provision, while Meltzer and Richard (1981) and Breyer and Ursprung (1998) study majority voting over redistributive taxation. These frameworks establish how income inequality and preferences shape equilibrium tax rates and public investment. My contribution here is to link private moral behavior with collective voting outcomes: I show that moral considerations toward public goods influence equilibrium tax rates and budget allocation, even when morality does not directly affect voting preferences. This provides a behavioral foundation for the political economy of redistribution.

A related body of research directly connects morality to voting behavior. Roemer (2010) applies Kantian reasoning to voting equilibria, showing that universalization leads to either near-universal abstention or universal turnout under knife-edge symmetry. Alger and Laslier (2022) extend this logic using homo moralis preferences, demonstrating that even modest moral universalization can substantially improve coordination and information aggregation in elections. My contribution to this strand is to show that even when moral considerations are not directly applied to the voting decision—as in my model, where morality only affects the public-good domain—they can indirectly shape political outcomes through their impact on agents' private behavior and the resulting policy preferences. This highlights an overlooked channel through which morality influences collective choice.

Finally, the paper complements emerging empirical research on morality, charitable behavior, and political orientation. Enke et al. (2024) show that individuals with stronger universalist moral values are more likely to engage in voluntary giving and to support left-leaning political positions. In contrast, Cagé et al. (2025) document the inverse channel, finding that the recent far-right political resurgence is associated with lower rates of charitable donations. Both studies thus reveal a close empirical link between moral motivation, prosocial behavior, and progressive political outcomes. My contribution to this empirical strand is to go beyond the established correlation between morally motivated giving and political outcomes by developing a unified theoretical framework that simultaneously examines the efficiency of public good provision and the distribution of ex-post outcomes. In my model, moral agents provide the public good efficiently and use the entire public budget for redistribution, yet I demonstrate that such moral coordination may paradoxically amplify inequality. This result provides a novel theoretical explanation for the complex relationship observed in the empirical evidence.

This paper presents three core contributions. First, it extends the optimization strand of Kantian analysis by embedding a universalizing contribution rule directly into a political-economy model of public good provision and majority voting. Second, it endogenizes the link between private contributions and political support by demonstrating how Kantian morality, interpreted as a form of universalization in agents' contribution choices, increases voluntary provision and alters the distribution of material outcomes, thereby changing the preferred tax-public good bundle of the median voter. Third, it unifies the literature on public good provision with the Kantian optimization literature and the political support literature, tracing a single moral channel that connects individual contributions to equilibrium policy choices. In doing so, it fills the critical gap of how morality in private decisions can transform collective decision-making over taxes and public good budgets. The analysis highlights a trade-off between moral behavior and the dispersion of outcomes, thereby offering new insights into the design of public policies in societies where ethical considerations are paramount. To the best of my knowledge, this is the first paper to study this contradicting trade-off between individual morality and inequality, through the political support of public policies.

The remainder of the paper is organized as follows. In Section 2, I introduce the theoretical framework, the common environment, and the private and public budget constraints. Section 3 studies the private decisions, and the political equilibrium in the society without moral considerations, while Section 4 does equally for the society with those moral considerations. Section 5 presents an ex-post analysis highlighting the implications of the model for the distribution of outcomes. Section 6 presents a discussion about the efficiency-equity trade-off, and Section 7 quantifies the results using Monte Carlo simulations. Finally, Section 8 concludes.

2 The model

2.1 Environment

I assume an economy with an odd number $n > 2$ of individuals that differ in their income level, w. The index $i \in N$, with $N = \{1, ..., n\}$, in a variable denotes the value of that variable for the ith agent, and the indexes m and a denote variables for agents with median and mean ex ante income, respectively. Agents are ordered from the lowest to the highest income $w_1 \leq w_2 \leq ... \leq w_n$. The cumulative distribution function of income is given by $F(w)$ and is skewed to the right, indicating that the median income is below the average $w_m < w_a$, with $m = (n+1)/2$ and $w_a = \sum_{i=1}^{n} w_i / n$. This assumption is consistent with the empirical observation that, in virtually all economies, a small fraction of the population earns disproportionately high incomes, pulling the mean above the median across countries and over time (see, e.g., Atkinson (2015); Piketty and Saez (2003)). In particular, this matches well-documented evidence that individual earnings distributions exhibit a lognormal core with a Pareto upper tail, which places disproportionate mass at high incomes and mechanically pulls the mean above the median (see Kopczuk et al., 2010). This stylized fact underpins much of the political economy literature on redistribution (*e.g.*, Meltzer and Richard (1981)). I make the following assumption regarding the ex ante income of the wealthiest agent:[2]

$$\textbf{Assumption:}\ w_n < \frac{n \cdot w_m}{2} \tag{1}$$

Agents engage in two types of actions: private and social. In the private scope, agents voluntarily contribute a non-negative amount q_i to the provision of a public good. Meanwhile, in the social context, an individual votes on public policies. The government implements two public policies: a redistributive policy through a lump-sum transfer T and a public good investment I, financed through a proportional tax rate $\tau \in [0, 1]$. The agent i, with an income of w_i, extracts utility from private consumption x_i and public good consumption Q. The overall level of the public good follows a linear technology of the sum of individual contributions and the public investment made by the government. Hence,

$$Q = \sum_{j=1}^{n} q_j + I \tag{2}$$

This implies that the marginal rate of transformation (MRT), *i.e.*, the rate at which the society can transform the private good into the public good, is equal to one. All agents have identical preferences that follow a Cobb-Douglas utility function:[3]

$$U_i \ = \ x_i^{1-\alpha} Q^{\alpha} \tag{3}$$

Preferences in (3) imply that the marginal rate of substitution of agent i (MRS_i), which indicates how much private consumption she is willing to forgo for an additional unit of the public good while maintaining a constant utility level, is a linear function of the ratio between private and public consumption. More precisely, the marginal rate of substitution of agent i can be expressed as $MRS_i(x_i, Q) \equiv U'_Q(x_i, Q)/U'_x(x_i, Q) = \left(\frac{\alpha}{1-\alpha}\right) \cdot \left(\frac{x_i}{Q}\right)$. Here, $\frac{\alpha}{1-\alpha}$ represents the relative preference or weight that agents assign to the public

[2] This assumption is supported for commonly used income distributions, even for a low number of agents. See Appendix B

[3] By assuming Cobb–Douglas preferences, I ensure closed-form demands that capture the trade-off between non-excludable public benefits and private enjoyment, while also enabling a morality framework that reconciles diverse Kantian views with low information requirements (see Section 4).

good compared to private consumption. I assume that these preferences are low, that is $\frac{\alpha}{1-\alpha} \ll 1$, or equivalently $\alpha \ll 1/2$. This assumption is supported by data on the willingness to pay for public goods and on experimental evidence.[4] Agent i contributes to the provision of the public good and consumes the remainder of their disposable income. Thus, the private consumption of an agent i is expressed as:

$$x_i = (1-\tau)w_i - q_i + T \tag{4}$$

where q_i represents the nonnegative contribution of agent i to the public good. I define the disposable income of agent i as the sum of after-tax income and the lump-sum transfer: $y_i = (1-\tau)w_i + T$.

2.2 Public Budget, and Timing

In the following, I assume a balanced public budget, where proportional taxation is costly for the government.[5] Formally, let $C(\tau)$ denote the deadweight loss of taxation, characterized by the common properties $C(0) = 0$, $C'(0) = 0$, $C'(\tau > 0) > 0$, $C''(\tau) > 0$, and $C'(1) = 1$. These assumptions regarding the convexity of the deadweight loss are standard in optimal tax theory and public finance, reflecting the idea that the marginal efficiency cost increases with the tax rate (see Saez (2001); Chetty (2009)).[6] Distortions increase with the tax rate and are intended to capture the various indirect impacts that taxation has on overall income through government inefficiencies, labor–leisure decisions, corruption, and other factors.[7] The government's balanced public budget can be expressed as:

$$(\tau - C(\tau)) \sum_{j=1}^{n} w_j = nT + I \tag{5}$$

The left-hand side of equation (5) represents the government's income, while the right-hand side pertains to the expenses incurred by both policies. To simplify notation when useful, I will omit the (τ) of the deadweight loss functions and their derivatives. I model the budget rule by defining $\nu \in [0, 1]$ as the share of the budget allocated to financing the public good. Consequently, the public investment in the public good

[4] A large meta analysis of 396 peer-reviewed contingent valuation studies with different types of public goods Drupp et al. (2025) found that the mean willingness to pay for these goods is approximately 164$ USD (2020) per year, with an average income of $38,092$$ USD (2020) per year, *i.e.*, and an average budget share of 0.43% devoted to these public goods. Andreoni and Petrie (2004) with experimental evidence on voluntary contributions also demonstrated limited private allocations to public goods even when agents observe the contributions of others. Taken together, these facts support $\alpha \ll 1/2$.

[5] Without costly taxation, as low-income agents are more numerous and income is exogenous, the political equilibrium ensures complete taxation, regardless of moral considerations for the public good (see Breyer and Ursprung (1998)), and identical ex-post outcomes among agents and societies.

[6] Harberger (1964) was the first author to study the inefficiency associated to taxation through a triangle analysis resulting in a deadweight loss proportional to a quadratic function of the tax rate. The convexity has been confirmed in partial (see Browning (1987); Feldstein (1999)) and general equilibrium frameworks (see Ballard et al. (1985)). I borrow $C'(1) = 1$ from Ghiglino et al. (2021) as it ensures that all agents have interior preferred tax rates and it eases the ex-post analysis.

[7] I abstract from any explicit analysis for simplicity. In a model with labor supply the results remain qualitatively the same, increasing the complexity of the derivations.

and the lump-sum transfer that ensures budget balance can be expressed as follows:

$$I = (\tau - C)\nu W,$$
$$T = (\tau - C)(1-\nu)w_a \tag{6}$$

with $W = \sum_{j=1}^{n} w_j = n\, w_a$ representing the overall income of the economy.

I assume that public policies are chosen first through a democratic voting process, and subsequently, agents make their individual actions, as private decisions can be adjusted frequently while public policy cannot. First, (i) the tax rate and the budget rule are determined through a vote among the population. (ii) Agents then pay taxes and receive the redistributive transfer, if applicable ($\nu < 1$). The government (iii) supplies the public good based on the budget rule and the tax revenue. Subsequently, (iv) agents decide, simultaneously, to voluntarily contribute to the public good if they believe that the government's provision is insufficient. Therefore, this decision depends on the presence of moral considerations regarding the public good, which is the unique feature by which the studied societies differ. I employ backward induction, solving for the optimal contributions of agents first, followed by an analysis of the political stage given these optimal private decisions.

3 A Society without Moral Considerations

This section examines the private decisions of agents and the resulting political equilibrium in a society devoid of moral considerations. Agents choose their contributions to the public good, q_i, treating the contributions of others as given. I use variables marked with a *tilde* ($\tilde{}$) to denote this baseline case. To begin with, I examine the optimal decision of agents under *Laissez-Faire*, that is when no public policy is in place.

3.1 Contributions without Morality under Laissez-Faire

When there are no policies in place, the individual i's budget constraint is given by $x_i + q_i = w_i$, and the total amount of the public good is determined by $Q \equiv \sum_{i=1}^{n} q_i$. For each individual i, let $Q_{-i} \equiv \sum_{j \neq i} q_j$. The problem of an agent i is characterized by:

$$\begin{aligned} &max_{q_i}\ \ x_i^{1-\alpha} Q^{\alpha}\ \ s.t. \\ &x_i\ =\ w_i\ - q_i(Q_{-i}) \\ &Q\ =\ \textstyle\sum_{j=1}^{n}\ q_j(Q_{-j}) \end{aligned} \tag{7}$$

This corresponds to the voluntary-contribution game studied by Bergstrom et al. (1985). The authors demonstrate that, in a society where agents possess identical preferences and the public good is a normal good, individuals with income above a specified threshold ($\tilde{w}$) contribute exactly the difference between their income and this threshold, while those with income below it do not contribute at all. This threshold is an increasing function of the public good level; hence, a higher public good level implies a weakly smaller set of contributors. The *F.O.C.* from (7) can be written in terms of marginal rate of substitution (MRS_i):

$$MRS_i(w_i - \tilde{q}_i(Q_{-i}), \tilde{q}_i + Q_{-i}) \equiv \left(\frac{\alpha}{1-\alpha}\right)\left(\frac{x_i}{Q}\right) \leq 1 \tag{8}$$

with equality if $MRS_i(w_i, Q_{-i}) > 1$, and with $\tilde{q}_i(Q_{-i}) = 0$, otherwise. Intuitively, given the contributions of all others, agent i contributes only if her willingness to substitute private consumption for the public good (her MRS_i) exceeds the marginal rate of transformation (MRT). Because technology is linear, the marginal rate of transformation is equal to one. Therefore, a positive contribution from agent i occurs only up to the point where $MRS_i = 1$. Conversely, if the contributions of others are such that $MRS_i < 1$, then she does not contribute. If all agents share the same preferences and the public good is a normal good, high-income individuals have a greater individual demand for the public good than their low-income counterparts. This implies that contributors consistently possess a higher income than non-contributors and that an income threshold exists which separates both groups, aligning with the result in Bergstrom et al. (1985).

Regarding the optimality of public good provision, from Samuelson (1954), the condition for optimality in a public good game states that the sum of the marginal rates of substitution of all agents must equal the marginal rate of transformation. In this paper the MRT equals one, the individual MRS of each contributor equals one, while the MRS of non-contributors is lower yet remains positive. Consequently, the public good is underprovided in the equilibrium of the game with voluntary contributions when agents lack moral considerations and when no policies are in place.

3.2 Contributions without Morality with Public Policies

In this section, I introduce public policies in the form of a public investment in the public good and a redistributive transfer. As explained by Bergstrom et al. (1985), if only a subset of the society contributes under *laissez-faire*, a public investment in the public good acts as a transfer of wealth from non-contributors to contributors. This investment increases the level of the public good while simultaneously raising the threshold for disposable income ($\tilde{y}$) above which agents make voluntary contributions, thereby reducing the set of contributors.[8] However, if the public good investment is sufficiently large, this threshold can exceed the disposable income of the wealthiest individual, ultimately crowding out voluntary contributions entirely.[9] I argue that, under the preferences outlined in (3), complete crowding out is, in fact, the norm when public policy parameters are set through collective decision-making, provided that the income of the richest agent is not excessively high (as outlined in Assumption 1).

For this reason, I first solve for the political equilibrium without private contributions ex-ante and then

[8]Note that as taxes and transfers are made before the contribution game, the threshold is now endogenous and its scope is disposable income, y, not exogenous income, w.

[9]In a game of voluntary contributions without public investment, Andreoni (1988) proved that the share of the population contributing decreases with population size, to the point that, in large societies, the share of the population contributing goes to zero. Similarly, Breyer and Ursprung (1998) demonstrated that in a large society with a public investment, agents without moral considerations never contribute to the provision of the public good.

compare the final public good provision with the demand of the wealthiest individual. Defining the equilibrium policy parameters without contributions as $(\tilde{\tau},\, \tilde{\nu})$, the condition for complete crowding out in equilibrium is expressed as:

$$MRS_n(y_n(\tilde{\tau},\tilde{\nu}), I(\tilde{\tau},\tilde{\nu})) \equiv \left(\frac{\alpha}{1-\alpha}\right) \cdot \left(\frac{y_n(\tilde{\tau},\tilde{\nu})}{I(\tilde{\tau},\tilde{\nu})}\right) < 1 \tag{9}$$

which is equivalent to $y_n(\tilde{\tau},\tilde{\nu}) < I(\tilde{\tau},\tilde{\nu}) \cdot \left(\frac{1-\alpha}{\alpha}\right)$. Since the preference for the public good is less than one half, a sufficient condition for complete crowding out is that the disposable income of the wealthiest agent remains below the public investment in the public good. Given that the investment in the public good is endogenous in the model, condition (9) cannot be tested immediately. However, as demonstrated in the following section, this sufficient condition transforms into $w_n < (n/2)\, w_m$ which is exactly Assumption 1. For now let us assume that condition (9) holds, then:

Claim 1. *In a society devoid of moral considerations, under condition (9), public policy crowds out entirely voluntary contributions. The provision of the public good equals public investment* $\tilde{Q} = (\tau - C)\nu n w_a \equiv I$*, and private consumption equals disposable income* $\tilde{x}_i = y_i = (1-\tau)w_i + (\tau - C)(1-\nu)w_a$*. Moreover,*

- *An increase in the tax rate raises public good provision, while private consumption increases only for agents with sufficiently low incomes; that is, for those with* $w_i < (1 - C')(1-\nu)w_a \equiv \tilde{w}$*.*
- *An increase in the share of the budget allocated to public goods enhances public good provision and reduces private consumption for all agents.*

Proof. See Appendix C.1. □

Since the redistributive policy benefits low-income agents, if a share of the public budget is utilized for redistribution, taxation will increase their private consumption at the expense of high-income individuals. However, as the redistributive policy is presented in the form of a universal lump-sum transfer, an increase in the share of the budget allocated to the public good systematically reduces the private consumption of all agents in society, while enhancing the provision of the public good. To prove that condition (9), I will next examine the political equilibrium.

3.3 Ideal Policies and Political Equilibrium without Moral Considerations

Let us now study the policies that each agent considers ideal, and how this translates into the collective decision process. I assume a direct democracy under majoritarian institutions, in which all agents vote on the tax rate and the budget rule, with abstention not permitted. Since the policy space is bi-dimensional, the analysis suffers from the *"curse of multidimensionality"* studied by Bernheim and Slavov (2009). Specifically, without any symmetry assumptions, if both policy parameters are voted upon simultaneously, no pair of policy values can consistently win against all other alternatives; therefore, no Condorcet winner exists.[10] In other words, one can always identify a new pair of policy parameters preferred by more than half of the population.[11]

For tractability, I follow De Donder et al. (2012) and assume that voting on the tax rate and the budget rule does not occur simultaneously. Two institutional arrangements are commonly used to address this issue: the *Kramer–Shepsle* and the *Stackelberg* procedures. The *Kramer–Shepsle* equilibrium (Kramer, 1972; Shepsle, 1979) assumes that votes are held separately on each policy dimension, but not sequentially. Voters decide on one dimension while taking the other as given, and the resulting outcome is consistent across dimensions: each policy component is the majority choice conditional on the other. In equilibrium, no dimension can be changed by a majority without upsetting this consistency. This self-supporting outcome resembles a Nash equilibrium in which both dimensions are mutually stable under majority rule. By contrast, the Stackelberg equilibrium assumes that voting is sequential. One policy dimension is determined first by majority rule. Given this first-stage outcome, voters then decide on the second dimension. Solving backward, the equilibrium is obtained by anticipating how the second vote responds to the first. Both procedures restore equilibrium existence in multidimensional policy spaces that otherwise lack a Condorcet winner.

In their paper, the authors define the component-wise ideal point of an agent i as $(\tilde{\tau}_i,\ \tilde{\nu}_i)$ such that $ArgMax_{\tau\in[0,1]}\ U(w_i,\tau,\tilde{\nu}_i) = \tilde{\tau}_i$ and $ArgMax_{\nu\in[0,1]}\ U(w_i,\tilde{\tau}_i,\nu) = \tilde{\nu}_i$, and they demonstrate that, under marginal single-crossing, the *Kramer-Shepsle* equilibrium represents the component-wise ideal point of the median agent. Marginal single crossing implies that the marginal utility of an agent with respect to both policy dimensions (τ and ν) increases or decreases monotonically with agents' income. Hence, given the other component, the ideal value of the median agent is a Condorcet winner in this uni-dimensional vote.

Furthermore, the authors also demonstrate that, under marginal-first-stage single crossing, the *Stackelberg* equilibrium remains indifferent with respect to the order of the votes and it also coincides with the component-wise ideal point of the median agent. Marginal-first-stage single crossing implies that the marginal indirect utility of the dimension chosen first is monotonic with respect to income, considering the response in the other dimension. Again this ensure that, in the sequential game, the ideal value of the median income agent is a Condorcet winner.

Lemma 1. *In a society devoid of moral considerations toward the public good, under condition (9) and the preferences outlined in (3), the Kramer-Shepsle and Stackelberg Equilibria coincide, matching the component-wise ideal point of the agent with median income.*

Proof. See Appendix C.2. □

[10] See Plott (1967) and Enelow and Hinich (1983) for the necessary and sufficient conditions of pairwise symmetry to ensure a Condorcet winner in multidimensional policy spaces when all components are voted upon simultaneously.

[11] In the context of a bi-dimensional policy space and agents differing in only one dimension, as discussed in this paper, De Donder et al. (2012) demonstrated, in their Proposition 2, that it is always possible to find a new pair of parameters preferred by almost everyone in society.

Lemma 1 allows me to focus on the component-wise ideal point of the agent with median income. In the following, I study the component-wise ideal point of agents under the preferences outlined in (3) while considering private consumption and public good provision from Claim 1. The first-order conditions that describe the ideal policy parameters of agent i in terms of marginal rates of substitution are expressed, respectively, as follows:

$$\nu : \quad MRS_i(\tilde{x_i}, \tilde{Q}) \equiv \left(\frac{\alpha}{1-\alpha}\right)\left(\frac{x_i}{Q}\right) \leq \frac{1}{n} \tag{10}$$

$$\tau : \; MRS_i(\tilde{x_i}, \tilde{Q}) \equiv \left(\frac{\alpha}{1-\alpha}\right)\left(\frac{x_i}{Q}\right) \leq \frac{w_i - (1-C')(1-\nu)w_a}{(1-C')\nu W} \tag{11}$$

Equation (10) relates to the optimality condition for the provision of a public good in a society populated by n agents with income w_i. In other words, in an interior solution, an agent's ideal budget share ensures the optimal provision of the public good in a hypothetical context where all agents share the same income level as her own. Equation (11) accounts for the net marginal gains from taxation, considering both the direct and indirect effects on private and public consumption. Defining $\phi_i = w_i/w_a$ as the normalized income of agent i, then:

Lemma 2. *In a society devoid of moral considerations toward the public good, under condition (9) and the preferences outlined in (3), a boundary on income $\overline{\phi} < 1$ exists, described by*

$$\Omega(\overline{\phi}) \equiv \left(\frac{C'^{-1}(1-\overline{\phi}) - C(C'^{-1}(1-\overline{\phi}))}{1-C'^{-1}(1-\overline{\phi})}\right)\left(\frac{1}{\overline{\phi}}\right) = \frac{\alpha}{1-\alpha} \tag{12}$$

such that the ideal policy parameters of agents with low income ($\phi_i < \overline{\phi}$) are characterized by:

$$1 - C'(\tilde{\tau_i}) = \phi_i \quad \textit{and} \quad \tilde{\nu_i} = \alpha \cdot \left(1 + \frac{(1-\tilde{\tau_i})\phi_i}{\tilde{\tau_i} - C(\tilde{\tau_i})}\right) \tag{13}$$

whereas the ideal parameters for those with high income ($\phi_i \geq \overline{\phi}$) are represented by:

$$1 - C'(\tilde{\tau}) = \left(\frac{1-\alpha}{\alpha}\right)\left(\frac{\tilde{\tau} - C(\tilde{\tau})}{1-\tilde{\tau}}\right) \quad \textit{and} \quad \tilde{\nu} = 1 \tag{14}$$

Given the properties of the deadweight loss function, C'^{-1} is an increasing function and all agents prefer an interior tax rate. Moreover:

- *For low-income agents, $\phi_i < \overline{\phi}$, as income increases, her preferred tax rate decreases and her preferred share for the public good increases ($\partial\tilde{\tau_i}/\partial\phi_i < 0$, and $\partial\tilde{\nu_i}/\partial\phi_i > 0$).*
- *For low-income agents, $\phi_i < \overline{\phi}$, the taste for the public good has no effect on the preferred tax rate, but it increases the preferred share for the public good ($\partial\tilde{\tau_i}/\partial\alpha = 0$ and $\partial\tilde{\nu_i}/\partial\alpha > 0$).*
- *High-income agents, $\phi_i \geq \overline{\phi}$, share the same ideal policy parameters.*

Proof. See Appendix C.3. □

The two cases presented in Lemma 2 do not represent distinct equilibria but rather two regions of the same equilibrium arising from the feasibility constraint that the share of the public budget devoted to the public good cannot exceed one ($\nu \leq 1$). The income cutoff $\overline{\phi}$ corresponds to the lowest-income agent who prefers to allocate the entire public budget to the public good rather than to devote a share to redistribution. Agents with income below this threshold choose an interior allocation, distributing resources between public investment and transfers, while those at or above it optimally locate at the corner where the entire budget is assigned to the public good. Hence, the change at $\overline{\phi}$ reflects a corner solution in ν rather than a discontinuity in preferences or equilibrium behavior. Under the conditions stated, the preferred tax rate of low-income agents is fully determined by the trade-off between the benefits they obtain from redistributive transfers and the losses caused by the deadweight cost of taxation, and is therefore independent of their preferences for the public good. In contrast, high-income agents, who gain little from redistribution, prefer a lower but positive tax rate that finances exclusively public investment.

Furthermore, from Lemma 1, the political equilibrium coincides with the component-wise ideal point of the agent with median income. As the preference for the public good is low, this implies that $\overline{\phi} \to 1$, hence, with a right skewed income distribution, the normalized income of the median falls below the income boundary $\phi_m < \overline{\phi} \approx 1$. Moreover, by definition, the normalized income of this individual is the ratio between the median and average income. In the literature, this median-to-mean ratio is often used as an inverse measure of ex-ante inequality in society, as it quantifies the extent to which the typical (median) person's income lags behind the average, which is inflated by high earners.[12] Following this literature, I state the following:

Proposition 1. *In a society devoid of moral considerations toward the public good, under condition (9) and the preferences outlined in (3), where the preference for the public good is significantly low ($\alpha \ll 1/2$), the median income falls below the income threshold $\phi_m < \overline{\phi}$. Consequently, under condition (9), the political equilibrium is characterized by:*

$$1 - C'(\tilde{\tau^*}) = \phi_m \quad \text{and} \quad \hat{\nu^*} = \alpha \cdot \left(1 + \frac{(1-\tilde{\tau^*})\phi_m}{\tilde{\tau^*} - C(\tilde{\tau^*})}\right) \tag{15}$$

Hence, from Lemma 2

- *Inequality increases the equilibrium tax rate while reducing the budget for the public investment ($\partial\tilde{\tau^*}/\partial\phi_i < 0$, and $\partial\tilde{\nu^*}/\partial\phi_i > 0$).*
- *Preferences for the public good have no effect on the equilibrium tax rate while increasing the share of the budget for the public investment ($\partial\tilde{\tau^*}/\partial\alpha = 0$ and $\partial\tilde{\nu^*}/\partial\alpha > 0$).*

[12] See Meltzer and Richard (1981), Cowell (2011), Atkinson and Bourguignon (2015), and Piketty and Saez (2003)

Proof. See Appendix C.4 □

Notice, as previously explained, that the equilibrium tax rate is entirely independent of preferences. An agent's tastes influence only the allocation of the budget between policies, rather than the overall size of the budget. Now, given the equilibrium characterized by Proposition 1, I demonstrate that no agent has incentives to contribute, confirming that condition (9) holds. The equilibrium public good investment can be expressed as:

$$\tilde{I}^* = \alpha n \cdot \big((1-\tilde{\tau^*})w_m + (\tilde{\tau^*} - C(\tilde{\tau^*}))w_a\big) \tag{16}$$

According to condition (9), this investment completely crowds out voluntary contributions if it ensures that the marginal rate of substitution for the wealthiest individual remains below one. Replacing (16) in condition (9) yields:

$$\tilde{y_n} < (1-\alpha)\, n \cdot \big((1-\tilde{\tau^*})w_m + (\tilde{\tau^*} - C(\tilde{\tau^*}))w_a\big) \tag{17}$$

This boundary is $(1-\alpha)\,n$ times the hypothetical disposable income of the median, if all the public budget was devoted to the redistributive policy. The public policies within this framework ensure that the disposable income of the wealthiest agent is always lower than her ex-ante income. The opposite holds true for the median agent, especially if the entire budget is allocated to the redistributive policy. Thus, Assumption 1 ensures that condition (17) is satisfied. Complete crowding out occurs even in societies that are not particularly large, thereby supporting Claim 1.

Corollary 1. *In a society devoid of moral considerations toward the public good, under the preferences outlined in (3), the equilibrium provision of the public good is characterized by:*

$$\tilde{Q}^* = \alpha W \cdot \big((1-\tilde{\tau^*})\phi_m + \tilde{\tau^*} - C(\tilde{\tau^*})\big) \tag{18}$$

and the equilibrium private consumption of an agent is given by:

$$\tilde{x_i} = (1-\tilde{\tau^*})w_i - (1-\tilde{\tau^*})\alpha w_m + (\tilde{\tau^*} - C(\tilde{\tau^*}))(1-\alpha)w_a \tag{19}$$

Moreover,

- *Equilibrium provision of the public good increases with the preference for the public good and decreases with inequality ($\partial\tilde{Q}^*/\partial\alpha > 0$ and $\partial\tilde{Q}^*/\partial\phi_m > 0$).*
- *Equilibrium private consumption decreases with the preference for the public good; however, the effect of inequality depends on the position of the agent in the income distribution, particularly the private consumption of low-income agents increase with inequality ($\partial\tilde{x_i^*}/\partial\alpha < 0$ and $\partial\tilde{x_i^*}/\partial\phi_m \lesseqgtr 0$).*

Proof. See Appendix C.5 □

Preferences for the public good mechanically increase its provision while reducing the private consumption of all agents in society. Similarly, inequality has a negative impact on the provision of public goods by increasing taxation, which in turn increases dead-weight loss, and by reducing the share of the budget allocated for public good. However, as it increase the share of the budget for redistribution it increase the private consumption of low-income agents at the expense of high-income ones.

I have developed a model of private provision of public goods and identified the political equilibrium of this economy when the government implements two public policies: a redistributive transfer and public investment in the public good. The deadweight loss of taxation and a low preference for the public good ensure interior equilibrium policy parameters, with public funds being used for both redistribution and public good provision. Moreover, I demonstrated that public provision ultimately completely crowds out voluntary contributions, even in societies that are not overly large.

However, individuals do not always make strategic decisions regarding their contributions; instead, they may aim to contribute the "right" amount. In other words, agents exhibit a degree of morality when determining their private contributions to the public good, which may also influence their political support for public policies. I study this society in the next section.

4 A Society with Moral Considerations

Modeling how moral considerations shape individual behavior presents challenges because "morality" encompasses heterogeneous motives (duty, reciprocity, fairness, universalism), and it applies non-uniformly across various domains. For this reason, I draw upon the literature of Kantian morality in economics, which links individual morality to individual behavior and has been previously tailored to the context of voluntary contributions to a public good. This perspective aligns with the categorical imperative: *"Act only according to that maxim whereby you can at the same time will that it should become a universal law"* (Kant (1785)), which implies that one should act in a way that one would wish others to emulate when facing the same situation. Early contributions formalized Kantian agents as those who choose actions under the assumption that others take a morally equivalent action (e.g., Laffont (1975)). Concretely, I assume asymmetric morality: agents apply Kantian reasoning solely to the decision of contributing to public goods, rather than to private consumption choices or other distributive concerns.[13] By definition, public goods are enjoyed by the entire society, and decisions regarding changes in their provision affect the whole population that benefits from them. For this reason, moral considerations regarding voluntary contributions to this type of goods carry more normative weight than moral considerations about private consumption.

Furthermore, the literature on moral considerations have largely focus on voluntary contributions for the public good. First, Sugden (1984) emphasizes reciprocity: individuals reward like with like, thereby sustaining contributions to a public good when others fulfill their part. This observation suggests that purely

[13] Laffont (1975) was the first author to introduce Kantian considerations in an economic framework, and he was explicit in that "every economic action takes place in the framework of a *specific* moral or ethics".

Kantian rules may be moderated by conditional motivations in practice; however, the ethical target remains the public good, not private consumption. Second, in tax-compliance behavior, Bordignon (1993) models fairness as an endogenous constraint tied to the government's terms of trade between taxes and publicly provided goods and to others' compliance. He explicitly derives a Kantian "fair tax" as a benchmark and then relaxes it with reciprocity, showing how moral constraints explain compliance patterns that standard selfish models cannot. Again, morality is applied to the public-good financing decision, not to general consumption choices.

Recent empirical literature study this domain-specific view of moral motivation. Enke et al. (2024) synthesizes a large body of evidence linking universalism in voluntary giving with political behavior and policy positions. Universalism is positively correlated with democrat vote shares and left-leaning votes of legislators, but moral orientations vary by context and issue bundle. This supports introducing moral universalization where it plausibly influences behavior. Complementing this, Bolton and Ockenfels (2000) showed that 'fairness' concerns can differ in intensity depending on the context, and Bénabou et al. (2024) run large-scale experiments on ends-versus-means trade-offs and found robust but context-dependent deontological choices. Agents indeed make decisions following moral considerations, but only in certain contexts. Moral behavior, in other words, is multi-dimensional and situational; modeling "Kantian" considerations as specific to the public-good margin is consistent with this evidence.

Within public goods, a key modeling choice is the definition of "moral equivalence." The literature offers several variants. Bordignon (1990) studies two polar "Kantian rules." Under the first rule, agents maximize their own utility by treating identical absolute contributions as morally equivalent. Under the second rule, agents maximize a hypothetical utilitarian aggregate by imputing their own utility function into everyone else's, such that morally equivalent actions scale with income. Both rules are parsimonious in information, as agents need only their preferences and observable incomes; however, they also represent extreme moral stances. With income heterogeneity, the "same absolute contribution" rule treats rich and poor alike in levels, thus offering too coarse an interpretation of universalizability. Conversely, the utilitarian-imputation rule drifts into egalitarianism over private consumption, shifting the ethical focus away from public-good provision per se.

A large body of literature motivates a middle ground. Bilodeau and Gravel (2004) argue that, when maxims are universalized, individuals with different incomes will generally select different contribution levels; what can be universalized more naturally is a rule, such as "contribute the same share of income," which they call a Kantian maxim in the public-good domain. Under homothetic preferences with a constant elasticity of contribution equal to unity, *i.e.*, the Cobb-Douglass utility function, that maxim is self-enforcing and informationally light: one need not know others' utility functions, only that the rule is share-based. This sits between the two poles above and keeps morality squarely on provision rather than redistribution.

The equilibrium notion that corresponds most closely to universalization is Roemer (2010)'s Kantian equilibrium: an action profile is Kantian if no agent would wish to change the common scale of everyone's action by any multiplicative factor. This captures the idea that a deviation is only admissible if one endorses others doing the same. In the environment studied here, under the preferences in (3), the "same income share" rule is consistent with a Kantian equilibrium and delivers a simple characterization of voluntary contributions.

Taken together, these insights justify the specific Kantian rule I adopt: each agent chooses the contribution rate (share of disposable income) that maximizes her own utility under the assumption that everyone contributes the same share. This rule (i) respects income heterogeneity more than equal-level contributions, (ii) avoids importing egalitarianism over private consumption into the analysis of public-good provision, (iii) requires minimal information, and (iv) nests naturally within Roemer (2010)'s Kantian equilibrium framework and the notion of a Kantian maxim in Bilodeau and Gravel (2004). I use variables marked with a *hat* ($\hat{}$) to denote this case. To begin with, as before, I examine the optimal decision of agents under *Laissez-Faire*, that is when no public policy is in place.

4.1 Contributions with Morality under Laissez-Faire

Agents choose their contributions under the assumption that all others will contribute the same share, k, of their income. In the absence of government intervention, an individual's budget constraint is $x_i = w_i - q_i$, where $q_i = kw_i$. The total amount of the public good is determined by $Q = \sum_{j=1}^{n} q_j = k \sum_{j=1}^{n} w_j$. The program for an agent of income w_i and moral considerations writes:

$$\begin{aligned} &max_k \;\; x_i^{1-\alpha} Q^{\alpha} \;\; s.t. \\ &x_i \; = \; (1-k)\, w_i \\ &Q \; = \; k \textstyle\sum_{j=1}^{n} w_j \end{aligned} \tag{20}$$

The first-order condition, in terms of the marginal rate of substitution, is expressed as follows:

$$MRS_i(w_i - \hat{q}_i, \sum_{j=1}^{n} \hat{q}_j) \equiv \left(\frac{\alpha}{1-\alpha}\right)\left(\frac{x_i}{Q}\right) = \frac{w_i}{W} \tag{21}$$

When agents universalize their contributions to the public good, the decision not to contribute implies no provision of the public good. In this context, a marginal increase in contributions results in an infinite increase in utility, $lim_{Q\to 0}\, MRS_i(w_i, Q) = \infty \; \forall i$. Hence, it is never optimal to refrain from contributing in equilibrium. Comparing (21) with (8), it is evident that all individuals demand a greater quantity of the public good when incorporating moral considerations. By replacing x_i and Q from (20) in (21), the optimal share of income contributed is $\hat{k} = \alpha$, which is independent of income. Thus, the optimal contribution of agent i is $\hat{q}_i = \alpha w_i$. As the contribution rate is independent of income, the Kantian rule is universalized and represents a Kantian maxim in the sense of Bilodeau and Gravel (2004).[14] Moreover, when agents possess

[14]By construction, since agents choose their contributions assuming that others will contribute the same share of income as they do, and since all ultimately choose the same rate of contribution in equilibrium, no agent will wish to scale the contributions of others by any multiplicative factor. Thus, this results in a Kantian equilibrium in the sense of Roemer (2010).

moral considerations regarding the public good, their voluntary contributions ensure that the sum of the marginal rates of substitution equals the marginal rate of transformation (which, in our context, equals one); hence, public good provision is optimal.

4.2 Contributions with Morality with Public Policies

Introducing public policies financed through taxation affects private contributions by impacting the disposable income available for individuals to make those contributions. Now, individuals contribute based on the assumption that all participants contribute an equal share of their disposable income. The program for an agent of income w_i and moral considerations writes:

$$\begin{aligned} & max_k \;\; x_i^{1-\alpha} Q^{\alpha} \;\; s.t. \\ & x_i \; = \; (1-k)\,(\,(1-\tau)w_i \; + \; (\tau - C(\tau))\,(1-\nu)\,w_a\,) \\ & Q \; = (\tau - C(\tau))\nu W \; + \; k \textstyle\sum_{j=1}^{n} y_j \\ & k \; \in \; [0,1] \end{aligned} \tag{22}$$

The transformed first-order condition expressed in terms of the marginal rate of substitution (previously Equation (21)) becomes:

$$MRS_i(y_i - \hat{q}_i, I + \sum_{j=1}^{n} \hat{q}_j) \equiv \left(\frac{\alpha}{1-\alpha}\right)\left(\frac{x_i}{Q}\right) \leq \frac{y_i}{Y} \tag{23}$$

where $Y = \sum_{j=1}^{n} y_j$ is the sum of all disposable income in the economy. If the public investment is sufficiently large such that the marginal rate of substitution of agents is above the ratio of their disposable income to overall disposable income ($MRS_i(y_i, I) \geq y_i/Y \;\forall i$), then agents will have no incentive to contribute ($\hat{q}_i = 0$). Moreover, if all agents contribute, the provision of the public good from (23) fulfills the Samuelson Rule and is constrained Pareto-efficient given the deadweight loss of taxation. As optimal contributions remain independent of income under policies, this implies that if one agent contributes, all agents do.

Lemma 3. *In a society with moral considerations toward the public good, under the preferences outlined in (3), the optimal contribution rate of agent i is $\hat{k} = \alpha - \frac{(\tau-C)(1-\alpha)\nu}{1-C-(\tau-C)\nu} \geq 0$. Agents contribute to the public good if and only if public investment remains sufficiently low; that is, when $F(\tau,\nu) \equiv \frac{(\tau-C)\nu}{1-C} < \alpha$, where F is an increasing function of both τ and ν. Hence,*

- *Contributions of agents decrease with both the tax rate and the share of the budget for the public good ($\partial\hat{k}/\partial\tau \leq 0$ and $\partial\hat{k}/\partial\nu < 0$).*

Proof. See Appendix D.1 □

Lemma 3 characterizes the boundary of public investment beyond which complete crowding out occurs in a society where agents possess moral considerations. When a positive share of the budget is allocated to provide the public good, both policy parameters diminish individual contributions. Moreover, with no taxation $C(0) = 0$ and the $F(0, \nu) = 0$, the public good is provided privately, and its provision is Pareto-efficient. The equilibrium supply of the public good in a society with moral considerations writes:

$$\hat{Q} = \begin{cases} \alpha \cdot (1 - C)W & \text{if} \quad F(\tau, \nu) < \alpha \\ \\ (\tau - C)\nu W & \text{otherwise} \end{cases} \tag{24}$$

Thus, when agents contribute, the supply of the public good is a share of the net general income of the economy, accounting for the dead weight loss from taxation. Moreover, when agents contribute, the provision of the public good is independent of the budget share. This arises from the fact that agents with moral considerations towards the public good adapt their contributions to any budget share in order to ensure optimal provision. The corresponding private consumption of agents writes:

$$\hat{x}_i = \begin{cases} (1 - \alpha)(1 - C)W \cdot \left(\dfrac{y_i}{Y}\right) & \text{if} \quad F(\tau, \nu) < \alpha \\ \\ y_i & \text{otherwise} \end{cases} \tag{25}$$

When agents are contributing, the private consumption of each individual is a share of the remaining net overall income $(1-\alpha)(1-C)W$, and the share that goes to each agent's private consumption depends on her participation in the overall disposable income y_i/Y. Taxation then has two effects on private consumption; through disposable income, and through the contribution rate. From (25) it is evident that the share of the budget for the public investment has two effects on private consumption when agents contribute. First, it decreases their disposable income by reducing the redistributive transfer. However, it also decreases their contribution to the public good. For agents with income above the average, the second effect dominates increasing their private consumption. For those with lower income than average, the first effect dominates, and their private consumption falls with the share of the budget for the public good. Given (24) and (25), the effects of policy parameters on public and private consumption are summarized as follows:

Claim 2. *In a society with moral considerations, if agents are privately contributing, then:*

- *The public good provision decreases with taxation, but is completely independent of the budget share ($\partial Q/\partial \tau < 0, \partial Q/\partial \nu = 0$).*
- *The private consumption increases with taxation for low-income agents ($\partial x_i/\partial \tau > 0$ if $w_i < \tilde{w}$), and with the budget share for high-income agents ($\partial x_i/\partial \nu < 0$ if $w_i < w_a$).*

Proof. See Appendix D.2 □

From Claim 2, the share of the budget allocated to the public good does not influence the provision. However, it exerts opposite effects on the private consumption of agents with below-average income compared to those with above-average income. This finding implies that no agent prefers an interior share for the public good, and it influences preferences regarding the tax rate. I will examine these preferences in the following section.

4.3 Ideal Policies and Political Equilibrium with Moral Considerations

As explained previously, the policy space in this model is bi-dimensional. Consequently, without any symmetry assumptions, no Condorcet winner exists when policy parameters are voted upon simultaneously. For this reason, I assume that voters cast their votes for each parameter separately, and I study both the *Kramer-Shespley* and the *Stackelberg* equilibria.

Lemma 4. *In a society with moral considerations toward the public good, under the preferences outlined in (3), the Kramer-Shepsle and Stackelberg Equilibria coincide, matching the component-wise ideal point of the agent with median income.*

Proof. See Appendix D.3. □

When agents are moral, they provide the public good optimally through voluntary contributions, thereby avoiding the dead-weight loss associated with taxation. Since agents with income above the average are also net losers from the redistributive policy, it is evident that their preferred policy parameters is no policies at all.[15] In the following, I study the component-wise ideal point of agents under the preferences outlined in (3) while considering public good provision and private consumption from (24) and (25), respectively. I derive the following:

Lemma 5. *In a society with moral considerations toward the public good, under the preferences outlined in (3), high-income agents ($\phi_i > 1$) prefer to avoid implementing any policies $\hat{\tau}_i = 0$ and $\hat{\nu}_i \in [0, 1]$. Conversely, low-income agents ($\phi_i < 1$) exhibit preferred policy parameters characterized by:*

$$\Psi(\hat{\tau}_i) \equiv \frac{(1-\alpha)(1-C(\hat{\tau}_i))(1-C'(\hat{\tau}_i)) - \alpha C'(\hat{\tau}_i)\cdot(\hat{\tau}_i - C(\hat{\tau}_i))}{(1-\alpha)(1-C(\hat{\tau}_i)) + \alpha C'(\hat{\tau}_i)\cdot(1-\hat{\tau}_i)} = \phi_i \quad \textit{and} \quad \hat{\nu}_i = 0 \tag{26}$$

where Ψ is a decreasing function of the tax rate, with $\Psi(0) = 1$ and $\Psi(1) = 0$. Hence, all low-income agents prefer an interior tax rate, and it follows that:

- *As income of an agent increases, her preferred tax rate decreases ($\partial\hat{\tau}_i/\partial\phi_i < 0$).*
- *As the absolute taste for the public good increases the preferred tax rate decreases ($\partial\hat{\tau}_i/\partial\alpha < 0$).*

Proof. See Appendix D.4 □

[15] See Appendix D.3

From Lemma 5, $\Psi(\hat{\tau}_i)$ captures the trade-off between increased private consumption resulting from the redistributive policy and the loss of both private and public consumption due to taxation and the associated deadweight loss. An increase in the tax rate has two negative effects: (i) an explicit effect through tax collection and (ii) an indirect effect resulting from deadweight loss, which diminishes the income "pool" from which contributions are drawn. From Lemma 4, the political equilibrium coincides with the component-wise ideal point of the agent with median income. Hence,

Proposition 2. *In a society with moral considerations toward the public good, under the preferences outlined in (3), as the median income is below the average ($\phi_m < 1$), the political equilibrium parameters are characterized by:*

$$1 - C'(\hat{\tau^*}) = \phi_m + \Delta_\tau \quad \textit{and} \quad \hat{\nu^*} = 0 \tag{27}$$

where $\Delta_\tau = \frac{\alpha C'(\hat{\tau^*})\cdot((1-\hat{\tau^*})\phi_m + \hat{\tau^*} - C(\hat{\tau^*}))}{(1-\alpha)(1-C(\hat{\tau^*}))} > 0$*. The budget exclusively finances the redistributive policy, and from Lemma 5:*

- *Higher inequality increases the equilibrium tax rate, while higher preference for the public good reduces it ($\partial\hat{\tau}_i/\partial\phi_m < 0$ and $\partial\hat{\tau}_i/\partial\alpha < 0$).*

Proof. Direct from Lemma 5 and the fact of $\phi_m < 1$. $\square$

The equilibrium tax rate in a society with moral considerations toward the public good depends on preferences, α. Since agents with lower incomes derive greater benefits from the redistributive policy, higher inequality leads to a comparatively poorer median voter who supports increased taxation to facilitate a larger redistributive transfer. Stronger preferences for the public good generate downward pressure on the tax rate through two distinct channels. First, consider the mechanical effect: a stronger preference for the public good implies a weaker taste for the private good, resulting in fewer incentives for the median voter to advocate for an increase in the redistributive policy. Second, the opportunity-cost effect that arises from the deadweight loss of taxation: a stronger preference for public goods suggests that taxation reduces the resources available for a more valuable public good. Both effects diminish the equilibrium tax rate.

Corollary 2. *In a society with moral considerations toward the public good, under the preferences outlined in (3), the equilibrium provision of the public good is characterized by:*

$$\hat{Q} = \alpha \cdot (1 - C(\hat{\tau^*}))W \tag{28}$$

and the equilibrium private consumption of agent i is given by:

$$\hat{x_i} = (1-\alpha)\left((1-\hat{\tau^*})w_i + (\hat{\tau^*} - C(\hat{\tau^*}))w_a\right) \tag{29}$$

Moreover,

- *Equilibrium provision of the public good increases with the preference for the public good and decreases with inequality ($\partial\tilde{Q}^*/\partial\alpha > 0$ and $\partial\tilde{Q}^*/\partial\phi_m > 0$).*

- *Equilibrium private consumption varies with the preference for the public good and inequality depending on the position of the agent on the income distribution, particularly private consumption of low-income agents increase with inequality and with a low preference for the public good ($\partial\hat{x_i^*}/\partial\alpha \lesseqgtr 0$ and $\partial\hat{x_i^*}/\partial\phi_m \lesseqgtr 0$).*

Proof. See Appendix D.5 ☐

5 Ex-Post Comparative Analysis

Now I compare the political equilibria of both societies; those with moral considerations and those without, and examine their implications for ex post outcomes. Again, the variables in a society devoid of moral considerations toward the public good are denoted with a *tilde* (˜), while those for the society that possesses moral considerations are indicated with a *hat* (ˆ).

5.1 Equilibrium Political Parameters

From Propositions 1 and 2, the equilibrium policy parameters differ between the two societies.

Proposition 3. *Under the preferences outlined in (3), the equilibrium policy parameters of a society devoid of moral considerations toward the public good exceed those of a society that adheres to such moral principles. That is, $\tilde{\tau^*} > \hat{\tau^*}$ and $\tilde{\nu^*} > \hat{\nu^*}$. Moreover,*

- *Stronger preferences for the public good increase the difference in the equilibrium policy parameters between societies ($\partial(\tilde{\nu^*} - \hat{\nu^*})/\partial\alpha > 0$ and $\partial(\tilde{\tau^*} - \hat{\tau^*})/\partial\alpha > 0$).*

- *Higher inequality decreases the difference in the equilibrium budget share for the public good between societies; whereas the effect on the difference in tax rates remains ambiguous ($\partial(\tilde{\nu^*} - \hat{\nu^*})/\partial\phi_m > 0$ and $\partial(\tilde{\tau^*} - \hat{\tau^*})/\partial\phi_m \lesseqgtr 0$).*

Proof. See Appendix E.1 ☐

Agents who have moral considerations toward the public good voluntarily contribute to its provision, thereby avoiding the deadweight loss associated with public provision and using public funds exclusively for the redistributive policy. These results relate to the empirical findings of Enke et al. (2024), in which universalism in the private giving dimension relates to higher Democratic vote shares, which are known to favor more redistributive policies. However, a higher tax rate reduces the total pool of income from which voluntary contributions are drawn, thereby increasing the marginal cost of taxation. To prevent excessively reducing the overall provision of the public good, the agent with median income opts for a lower tax rate in the society with moral considerations toward the public good. As these two effects seem to have opposite implications, I turn to study the ex post outcomes in each society.

5.2 Public Good Provision and Private Consumption

The difference in the equilibrium policy parameters outlined in Proposition 3 implies variations in public good provision, as well as differences in the ex-post distribution of private consumption and utility. From (18) and (28), along with the tax rate ordering presented in Proposition 3:

Corollary 3. *Under the preferences outlined in (3), the equilibrium provision of the public good is constrained Pareto efficient in a society with moral considerations, given the deadweight loss of taxation, and it is always greater than in a society devoid of such moral considerations.*

Proof. Direct from Corollaries 1 and 2, and Proposition 3. □

As expected, the provision is higher in the society where agents, following moral considerations and avoiding the inefficiencies of taxation, provide the public good themselves. Let me now study the private consumption of agents. To study the effect of moral considerations toward the public good on private consumption I analyze the difference between private consumption of a particular agent between both societies. From Corollaries 1 and 2 this disparity is characterized by:

$$\Delta x_i = \hat{x_i} - \tilde{x_i} = Aw_i + Bw_a \tag{30}$$

where $A = \tilde{\tau^*} - \hat{\tau^*} - \alpha(1 - \hat{\tau^*})$ and $B = \alpha(1 - \tilde{\tau^*})\phi_m - (1 - \alpha)\big(\tilde{\tau^*} - C(\tilde{\tau^*}) - \hat{\tau^*} + C(\hat{\tau^*})\big)$. The parameter A determines the effect of moral considerations on private consumption, which operates through individual income, while B reflects the impact unrelated to individual income. Notice that when A and B differ in sign, a boundary of relative income, $\overline{\Phi} = -B/A$, exists. If $A > 0$ and $B < 0$, then only high-income agents with $\phi_i > \overline{\Phi}$, have a higher private consumption in the society with moral considerations toward the public good. Conversely, if $A < 0$ and $B > 0$, then only low-income agents with $\phi_i < \overline{\Phi}$ have a higher private consumption in the society with moral considerations toward the public good. Even more,

Lemma 6. *For small tax rates, there exist two boundaries:*

$$r(\phi_m, \alpha) \equiv \frac{(1-\phi_m)(1+\phi_m-\alpha)}{1-\alpha(1-\phi_m)} < \frac{(1-\phi_m)\left(2(1-\alpha)+\alpha\phi_m\right)}{1-\alpha(1-\phi_m)} \equiv s(\phi_m, \alpha) \tag{31}$$

with $c = C''(0)$ related to the deadweight loss of taxation, such that:

1. *If $c < r(\phi_m, \alpha)$, then $A > 0$, $B < 0$, and only high-income agents with $\phi_i > \overline{\Phi}$ exhibit higher private consumption in a society with moral considerations.*

2. *If $r(\phi_m, \alpha) < c < s(\phi_m, \alpha)$, then $A < 0$, $B < 0$, and all agents have lower private consumption in a society with moral considerations.*

3. *If $s(\phi_m, \alpha) < c$, then $A < 0$, $B > 0$, and only low-income agents with $\phi_i < \overline{\Phi}$ have higher private consumption in a society with moral considerations.*

Proof. See Appendix E.2 $\square$

Lemma 6 reveals that no scenario allows all agents to experience larger private consumption in a society with moral considerations. Moral considerations compel agents to contribute a share of their disposable income, thereby reducing their private consumption. However, an asymmetry exists between the gains and losses in private consumption for low-income and high-income agents. This generates problems in evaluating the Pareto dominance of one society relative to another. For agents with a higher private consumption in the society with moral considerations, it is evident that they are better-off as both public provision and their private consumption are higher. However, for those for whom morality dampens private consumption, the effect on individual welfare is ambiguous. From Equation (30), A and B represent, respectively, the income-related and non-income-related effects of individual morality on private consumption. Thus, $r(\phi_m, \alpha)$ measures the positive relationship between individual income and increased private consumption under moral considerations. Conversely, $s(\phi_m, \alpha)$ quantifies the negative effect of morality on private consumption for all agents, regardless of their income. The difference between both boundaries measures the extent to which moral considerations reduce private consumption of all agents in society. Now, let us examine the effects of the preference for the public good, α, and ex-ante inequality, ϕ_m (an inverse measure), on these functions.

Proposition 4. *For small tax rates, under the preferences outlined in (3), both $r(\phi_m, \alpha)$ and $s(\phi_m, \alpha)$ are decreasing functions of ϕ_m and α. Moreover, the difference between both is also a decreasing function of ϕ_m and α. Hence,*

- *Higher inequality and lower preferences for the public good always increase the positive relationship between moral considerations and private consumption coming through income, which translates in low income agents having lower private consumption.*

- *Higher inequality and lower preferences for the public good increase the negative effect of moral considerations on private consumption that do not arise from income.*

- *Higher inequality and lower preferences for the public good increase the overall negative effect of moral considerations on private consumption for all agents.*

Proof. See Appendix E.3. $\square$

Proposition 4 states that higher inequality and a lower preference for the public good imply that the gains in private consumption from individual morality are either captured by high-income agents or are not realized by anyone in society. From Corollaries 1 and 2, higher inequality increases the private consumption of low-income agents in both societies. However, as I explain in the following, the increase is larger in the society devoid of moral considerations towards the public good. From Propositions 1 and 2, inequality generates upward pressure on tax rates in both societies, but the tax rate in a society with moral considerations remains consistently lower. Moreover, in the society devoid of moral considerations toward the public good, higher inequality reduces the share of the budget devoted to the public good, thereby increasing the budget for the redistributive transfer. Together, these two effects guaranty that inequality, through it's effects on the equilibrium policy parameters, increases the private consumption of low-income agents more significantly in a society devoid of moral considerations towards the public good.

Under a low preference for the public good, agents in the society without moral considerations can redirect resources toward the redistributive policy, through the budget share, which benefits low-income consumption. However, in a society with moral considerations, this shift cannot occur through policies, as the entire budget already finances the redistributive policy. Reallocation occurs through a decrease in contributions to public goods; given that these contributions are proportional, high-income agents gain more in private consumption than low-income agents do. As a result, paradoxically, morality could increase poverty, as measured by the private consumption of low-income agents in a society, while simultaneously increasing private consumption among high-income agents. This indirect effect of morality ultimately contributes to rising inequality. I study this phenomenon in the next section.

5.3 Inequality

Now, I examine the differences in ex-post inequality between the two societies. Since taxation primarily finances the redistributive policy in the society with moral considerations, one might assume that this leads to lower ex-post inequality within that society. However, in contexts characterized by high inequality and low preferences for the public good, moral considerations regarding the public good may influence both policy and private responses in equilibrium. Essentially, there are two types of responses to changes in inequality and/or preferences: (i) the *policy response*; which arises from variations in the equilibrium policy parameters; and (ii) the *behavioral response*; as agents can adjust their voluntary contributions.

Nevertheless, the availability and magnitude of these responses vary across both societies in equilibrium. In a society devoid of moral considerations toward the public good, voluntary contributions are completely crowded out in equilibrium, thereby eliminating any behavioral response. In a society with moral considerations, these responses exist; however, as the budget is fully allocated for the redistributive policy, this implies that all policy responses occur through taxation. I study the circumstances under which ex post inequality is higher in a society with moral considerations.

Since $\phi_m = w_m/w_a$ serves as an inverse measure of ex ante income, I employ the ratio of average to median across different ex post variables as the main inequality measure. I examine the ex post inequality in disposable income, private consumption, and utility within both societies utilizing the corresponding ratios: $\sigma^y = y_a/y_m$, $\sigma^x = x_a/x_m$, and $\sigma^U = U(x_a, Q)/U(x_m, Q)$. Evidently, higher values of these ratios indicate greater disparities in the respective measure. Without moral considerations, agents do not contribute to the public good in equilibrium; hence, private consumption equals disposable income. In contrast, when moral considerations are taken into account, all agents contribute an equal fixed share of their disposable income. This implies that the ratio of disposable income is identical to the ratio of private consumption. Given the preferences outlined in (3), that are the same between the two societies, it is straightforward to demonstrate that the ex-post inequality measure of utilities aligns with the measures of private consumption and disposable income in both societies, $\sigma^y = \sigma^x = \sigma^U$. Hence,

Lemma 7. *The ranking of societies based on the three inequality measures—disposable income, private consumption, and utility—remains consistent.*

From Lemma 7 if the ex-post inequality in one inequality measure, *e.g.* disposable income, is higher in one society compared to another, it will also be higher in the other two variables. This allows me to state the following:

Proposition 5. *For small tax rates, in societies characterized by higher ex-ante inequality and lower preferences for the public good, moral considerations towards the public good increase ex-post inequality in equilibrium. This result comes from the reduced private consumption of low-income agents due to moral considerations, alongside with the increase consumption of high earners.*

Proof. See Appendix E.4 □

If ex-ante inequality is high, this creates upward pressure on the tax rate in both societies and on the public budget for the redistributive policy in the society devoid of moral considerations. This increases the private consumption of low-income agents more in the society devoid of moral considerations. Similarly, a low taste for the public good prompts agents to reallocate resources from the public good to private consumption. In the society devoid of moral considerations, this occurs by increasing the share of the budget that funds the redistributive policy. In a society with moral considerations, this happens through a reduction in contributions. Again, since contributions are proportional, this decrease benefits higher-income agents in terms of private consumption. Proposition 5 exhibits a non-evident trade-off between morality regarding public goods and inequalities in outcomes. In the context of individual morality towards a public good, although indeed it ensures a higher and optimal provision of the public good it also, paradoxically, promotes lower taxation and behavioral responses that may increase inequality in equilibrium. I discuss this trade-off in the following section.

6 Discussion Efficiency vs. Equity

Corollary 3 shows that, in the society with moral considerations toward the public good, equilibrium provision is higher and *constrained Pareto efficient*: the aggregate marginal rate of substitution equals the marginal rate of transformation, i.e., $\sum_i MRS_{i,} = MRT$. In the model, morality shifts provision to the private margin relaxing fiscal distortions and delivering the efficient quantity of the public good subject to institutional constraints, in line with a Mirrleesian notion of constrained efficiency (Mirrlees (1971)). This mechanism echoes classic insights from optimal-tax theory and the design of redistribution: pursuing equity through the tax-transfer system typically entails efficiency costs. In contrast, reducing those distortions shifts the allocation toward efficiency at the expense of redistributive power (e.g., Atkinson and Stiglitz (1976); Saez (2001); Diamond and Saez (2011)). Propositions 4 and 5 highlight this trade-off in the context of moral considerations towards the public good: by lowering the political demand for taxation and through specific policy responses to inequality and preferences, moral considerations may generate higher ex-post inequality in disposable income, consumption, and utility. This establishes an *efficiency–equity trade-off*: the moral channel raises the public good provision and reduces deadweight loss, but it may weaken the state's redistributive capacity and increase dispersion.

From a normative perspective, it is clear that greater inequality may lower social welfare. Jones and Klenow (2016), through welfare accounting at the macro level integrating consumption, leisure, longevity, and *inequality*, confirmed that dispersion materially depresses welfare relative to aggregates such as GDP. In Atkinson (1970), social welfare equals the *equally distributed equivalent* (EDE) income; dispersion drives a wedge between mean income and the EDE, so higher inequality mechanically reduces welfare. Sen (1976)'s "real national income" embeds distributional concerns directly into welfare accounting and delivers the same qualitative implication: holding resources constant, a mean-preserving spread lowers social welfare. In the model, utility is bidimensional; agents extract utility from both private and public consumption, and due to the moral frameworks, the political equilibria differ. This generates distinct deadweight losses and differences in the distribution of private consumption, which further complicates the welfare analysis.

Furthermore, a large empirical and theoretical literature documents that inequality is not only a distributional concern but can also generate adverse social and economic outcomes. At the macroeconomic level, Alesina and Rodrik (1994) and Persson and Tabellini (1994) show that higher inequality is associated with slower growth, largely through political-economy and investment channels. Relatedly, Aghion et al. (1999) highlight how inequality hampers growth when credit-market imperfections restrict investment in human capital. From a social and political perspective, Fajnzylber et al. (2002) and Alesina and Perotti (1996) find that inequality is linked to higher crime and political instability, respectively. In the health and demographic domains, Deaton (2003) reviews robust evidence that inequality correlates with poorer population health outcomes, and Case and Deaton (2015) identify rising mortality among low-education groups in the United States as a consequence of widening disparities. Finally, Chetty et al. (2014) document a strong negative relationship between inequality and intergenerational mobility in the United States. Taken together, these findings suggest that inequality can undermine long-term economic performance, social cohesion, and individual well-being, making it not merely an efficiency issue but also a normative and policy-relevant concern.

Putting these strands together, the results in this paper point to a non-trivial interaction between efficiency and equity. When ex-ante inequality is modest and tastes for the public good are strong, moral motivations can deliver both high (and efficient) provision of the public good and improvements in ex-post inequality. However, when ex-ante inequality is high or preferences for the public good are weak, the same mechanism may reduce the redistributive role of the state, raising questions about the distributional consequences of moral provision. The resulting efficiency–equity tension is therefore not theoretically resolved: it represents a genuine normative problem that policymakers and societies must weigh when evaluating moral or behavioral foundations of public-good provision. In the next section, I use Monte Carlo simulations to quantify the effect of individual morality on the distribution of outcomes across agents.

7 Monte Carlo Simulations

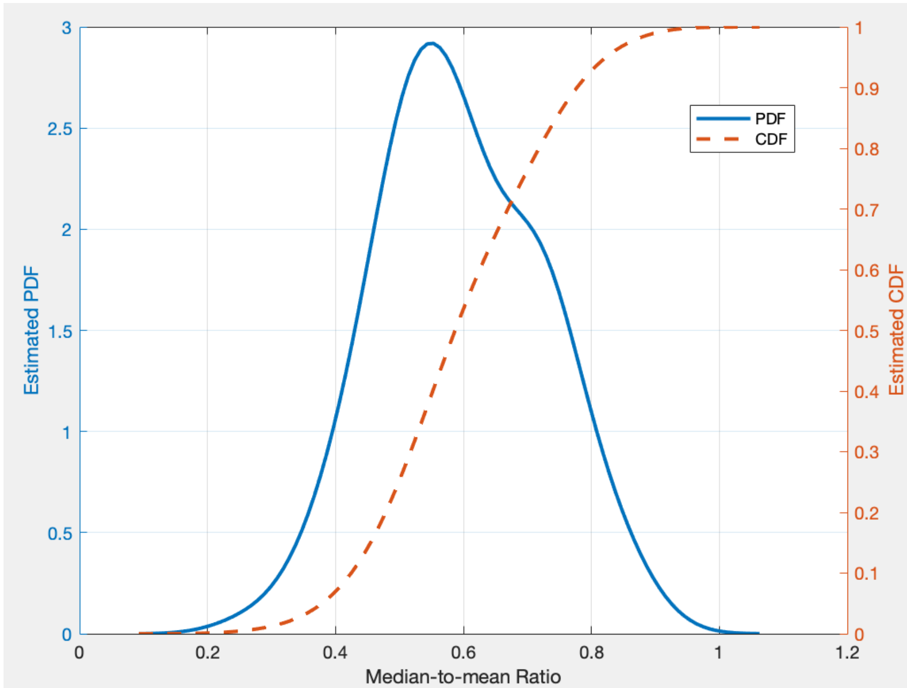
To quantify the results from Proposition 5 and generalize them to non-small tax rates, I will conduct a Monte Carlo simulation that assumes a quadratic deadweight loss, $C(\tau) = \tau^2/2$. In this context of inefficiency, the equilibrium tax rate in a society without moral considerations is $\tilde{\tau^*} = 1 - \phi_m$. Conversely, in a society that incorporates moral considerations, the equilibrium tax rate solves the following cubic formula:

$$(\hat{\tau}^*)^3 - (1+\alpha)(1-\phi_m)(\hat{\tau}^*)^2 - 2 \cdot (1 - \alpha(1-\phi_m))\hat{\tau}^* + 2 \cdot (1-\alpha)(1-\phi_m) = 0. \tag{32}$$

Given the complexity of the analytical solutions of (32), I rely on simulations to find the equilibrium tax rates given different values of the taste for the public good α and the ex-ante median to mean income ratio ϕ_m. The simulation consists on 100,000 draws where I compute the Gini of disposable income, private consumption and utility under both societies. Then, I find the probability of having higher inequality levels in the society with moral considerations. The taste for the public good α is drawn from a uniform distribution between 0.05 and 0.25. The society consists of 10,000 individuals with income taken through a random draw from a lognormal distribution with parameters μ and σ. The theoretical median and mean of the lognormal distribution write $w_m = e^{\mu}$ and $w_a = e^{\mu + \frac{\sigma^2}{2}}$. Hence, the theoretical median-to-mean ratio writes $\phi_m = e^{-\frac{\sigma^2}{2}}$, and $\sigma = \sqrt{-2\, ln(\phi_m)}$. Using pre-tax national income data of the median-to-mean ratio for 193 countries from the World Inequality Database, the value of ϕ_m is generated by inverse sampling from the empirical PDF estimated via the kernel estimator[16].

[16] See Appendix F for details.

Figure 2: Kernel-estimated PDF and CDF of Pre-tax Median-to-Mean Ratio (2023)



Notes: Figure 2 plots the estimated probability density function, and it's corresponding cumulative distribution function, of the median-to-mean ratio for 193 countries, using a kernel estimation method. *Source:* Own elaboration with data from the World Inequality Database

From Figure 2, more than half of the countries in the sample exhibit a median-to-mean ratio below 0.6. This subset of countries is more prone to experiencing higher inequality associated with individual mortality. The discrete Gini formula of a variable x, ordered from low to high ($x_1 \leq x_2 \leq ... \leq x_n$), is expressed as:

$$G = \frac{1}{n}\left(n + 1 - 2\frac{\sum_{j=1}^{n}(n+1-j)x_j}{\sum_{j=1}^{n} x_j}\right) \tag{33}$$

Given preferences, the ranking of societies under these three measures remains constant, which relates directly to Lemma 7. In a society without moral considerations, private consumption exactly equals disposable income. In contrast, a moral society allocates a fraction $1-\alpha$ of disposable income to private consumption. Hence, from (33) the Gini coefficients for disposable income and private consumption are identical in both societies. Under Cobb-Douglas preferences, the Gini of utilities has the same form as that of disposable income or private consumption, but each term in the sum is raised to a power $1-\alpha$[17]. Figure 3 confirms the findings derived from Proposition 5. The red and blue data points represent the Gini of utility in societies with and without moral considerations, respectively. Consistent with the above, the red data points are

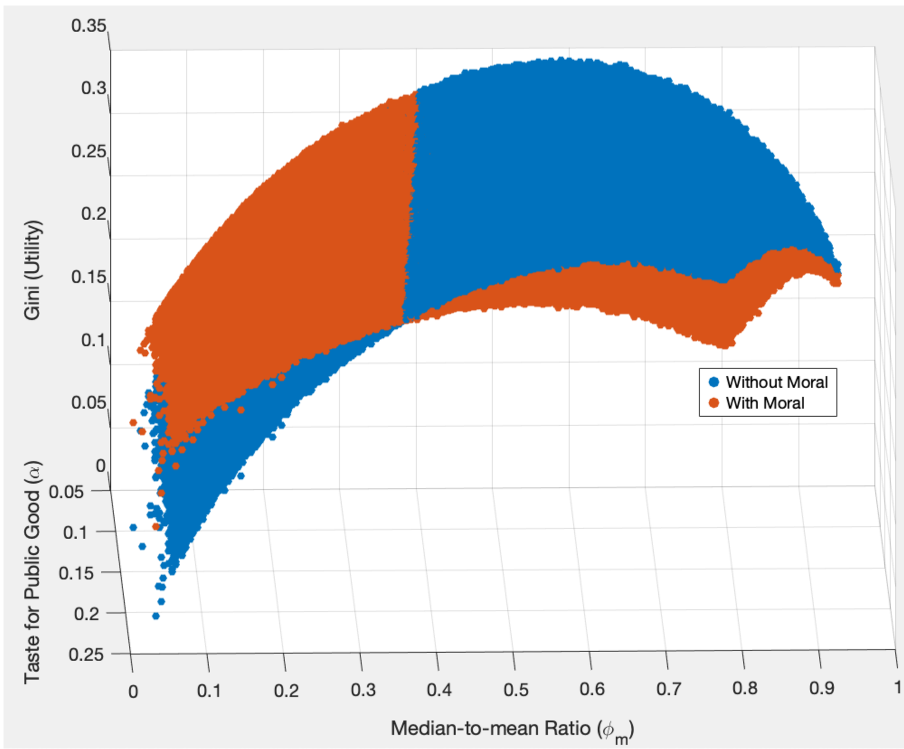
[17]More explicitly, the Gini of private consumption (or disposable income), and utility writes, respectively:

$$G(x) = G(y) = \frac{1}{n}\left(n+1-2\frac{\sum_{j=1}^{n}(n+1-j)y_j}{\sum_{j=1}^{n} y_j}\right) \quad \text{and} \quad G(U) = \frac{1}{n}\left(n+1-2\frac{\sum_{j=1}^{n}(n+1-j)y_j^{1-\alpha}}{\sum_{j=1}^{n} y_j^{1-\alpha}}\right)$$

positioned above the blue ones for low values of both α and ϕ_m. In other words, individual morality towards the public good is associated with higher ex-post inequality in societies that possess a low taste for the public good and experience higher ex-ante inequality[18]. Consequently, policies targeting individual morality of agents towards public goods could change the political preferences of agents and favor inequality.

Quantifying these results reveals a 34.3% probability of encountering greater inequality in societies with moral considerations, based on current median-to-mean ratios of countries. Furthermore, when analyzing countries with larger ex-ante income inequality (those with $\phi_m < 0.6$) this probability rises to 54.3%.

Figure 3: Gini Utility vs. Parameters



Notes: Figure 3 plots the Monte Carlo simulated Gini of utility against ex-ante inequality (measured by the inverse of ϕ_m) and the taste for the public good (α). Evidently, inequality is higher in a society with moral considerations when the ex-ante inequality is high and the taste for the public good is low. *Source:* Own elaboration with 100,000 draws under the assumption of quadratic dead-weight loss.

Still, the pre-tax national income data from the World Inequality Database are reported on an equal-split-among-adults basis, which tends to underestimate true inequality (Garbinti and Goupille-Lebret (2020)). To address this issue, I introduce a leftward shift, ε, in the parameter ϕ_m during each Monte Carlo iteration. This shift captures both the underestimation inherent in the data and the potential increases in ex-ante inequality. Table 1 reports how the probability that inequality under morality ($\hat{G}$) exceeds the baseline ($\tilde{G}$) rises as ε increases, both overall and conditional on countries in the bottom half by median-to-mean income ratio ($\phi_m < 0.6$).

[18]The same for disposable income/private consumption as seen in Figure 6 in Appendix F.

ε	**0**	**0.02**	**0.04**	**0.06**
Prob$(\hat{G} > \tilde{G})$	34.3%	36.1%	38.0%	40.3%
Prob$(\hat{G} > \tilde{G} \mid \phi_m < 0.6)$	54.3%	54.7%	55.3%	56.3%

Table 1: Probability of higher inequality with moral considerations
Source: Own Simulations with data from the WID Database.
Lecture note: Table 1 shows the impact in different probabilities of an increase in inequality through a leftward shift of ϕ_m.

As ε grows from 0 to 0.06, the overall probability of greater post-moral inequality increases by six percentage points (from 34.3% to 40.3%), for the lower-inequality half of countries, this probability rises by two percentage points (from 54.3% to 56.3%). This underscores that in more unequal settings, even when starting from the same baseline income distribution, introducing moral preferences for public good provision significantly increases the likelihood that low-income agents will bear a heavier burden, thereby amplifying ex-post disparities in income, consumption, and utility.

8 Conclusion

This paper develops a comprehensive model that bridges individual morality with political support for public policies. I model morality as a proportional Kantian rule, consistent with the broader Kantian optimization literature. The analysis reveals that societies in which citizens are guided by moral considerations toward the public good tend to select lower tax rates that finance only redistributive transfers, while purely self-interested societies favor higher taxes that fund both public investment and redistribution. These divergent fiscal choices produce markedly different outcomes. In particular, when ex-ante inequality is high and preferences for the public good are weak, moral considerations can lower the private consumption of low-income agents while increasing that of high earners, leading to greater ex-post inequality.

From an efficiency standpoint, moral behavior enhances the provision of the public good, achieving constrained Pareto efficiency, fulfilling the Samuelson rule, for a given the deadweight loss. However, this same mechanism shifts the burden of redistribution away from the state, introducing an efficiency–equity trade-off that is theoretically ambiguous but normatively relevant. The discussion situates these results within the broader literature showing that inequality is not only a distributive concern but also associated with adverse macroeconomic, social, and health outcomes. Thus, while moral motivations can improve allocative efficiency in the provision of public goods, they may also reduce the redistributive capacity of fiscal policy in ways that amplify inequality.

To quantify these effects, I conduct Monte Carlo simulations using pre-tax income data from the World Inequality Database. Even under a conservative specification that underestimates inequality, the model predicts a 34.5% probability that a society with moral considerations experiences higher ex-post inequality. Empirically, data from the World Values Survey and the European Values Survey (1981–2022) support these theoretical predictions: a statistically significant negative relationship exists between the willingness to contribute to environmental protection—a proxy for moral concern toward public goods—and preferences for redistribution.

Overall, the findings underscore that policies and interventions fostering civic morality and voluntary provision can generate efficiency gains in public-good provision but may simultaneously weaken equity through political channels. The design of social institutions should therefore recognize morality as a double-edged mechanism: it can promote cooperative behavior and efficient outcomes but must be balanced with redistributive safeguards to maintain social fairness and cohesion. A natural extension of the model would be to study one society with morality as an extra dimension of heterogeneity, and analyze how the share of the moral population affect the political equilibrium and the ex-post efficiency and equity. Moreover, including differences in the technologies of private and public provision may create distinct mechanisms mediated by morality and political stage. These investigations are left for future research.

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A Figure 1 - Details

Using data from the Integrated World Value Survey and the World Inequality Database, Figure 1 plots the average responses by country to question B001, where agents are asked to strongly disagree, disagree, agree, or strongly agree with the following statement: *"I would give part of my income if I were certain that the money would be used to prevent environmental pollution"*. This is compared to question E035, which asks individuals how they would place themselves on a scale from one to ten, with one being *"Incomes should be made more equal"* and ten being *"We need larger income differences as incentives"*. The willingness to contribute to the environment serves as a proxy for individual morality regarding public goods. I utilize the most recent available wave during which question B001 was asked (2004-2010) and retain countries with more than 500 respondents, comprising 78 countries. By employing pre-tax income data on the share of income held by the top 10% of the income distribution, I categorize the sample into two groups based on whether the countries fall above or below the median share. A clear negative relationship exists between the variables, which is steeper in more unequal countries. This finding suggests that individual morality negatively correlates with redistributive preferences, particularly in countries characterized by higher inequality. As illustrated in Figure 4, this negative correlation, which intensifies with inequality, remains evident when employing alternative proxies for individual morality, such as the proportion of individuals who favor environmental protection over economic growth.

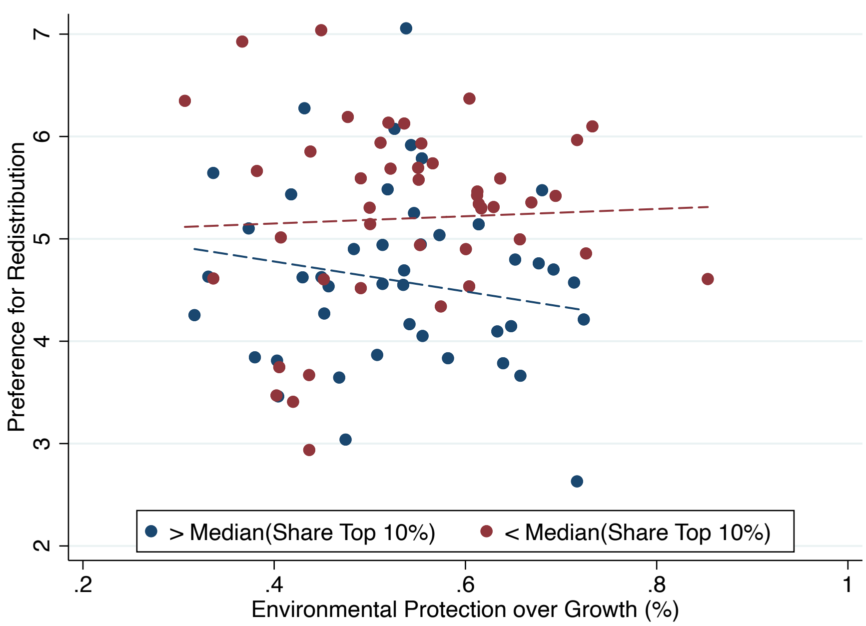

Figure 4: Environmental Protection Over Growth vs. Preferences for Redistribution (2017-2022)
Source: Own elaboration with data from the Integrated Value Survey merging World Value Survey and the European Value Survey (1981-2022) and the World Inequality Database (1989-2023).
Lecture note: Figure 4 uses data from the last wave where the relevant questions were asked (2017-2022) and plots the share of respondents per country and wave that favor environmental protection over economic growth – measured with question B008 of the survey – against the preference for redistribution – measured with question E035 of the survey – for 91 countries, and shows a decreasing relationship.

From Figure 5, the importance of religion exhibits a negative relationship with preferences for redistribution. However, inequality does not appear to significantly amplify this negative relationship. This can be explained by the fact that religion does not directly relate to the willingness to contribute to a public good, but rather influences the willingness to contribute to private goods such as food or shelter for the poor (see Elgin et al. (2013)).

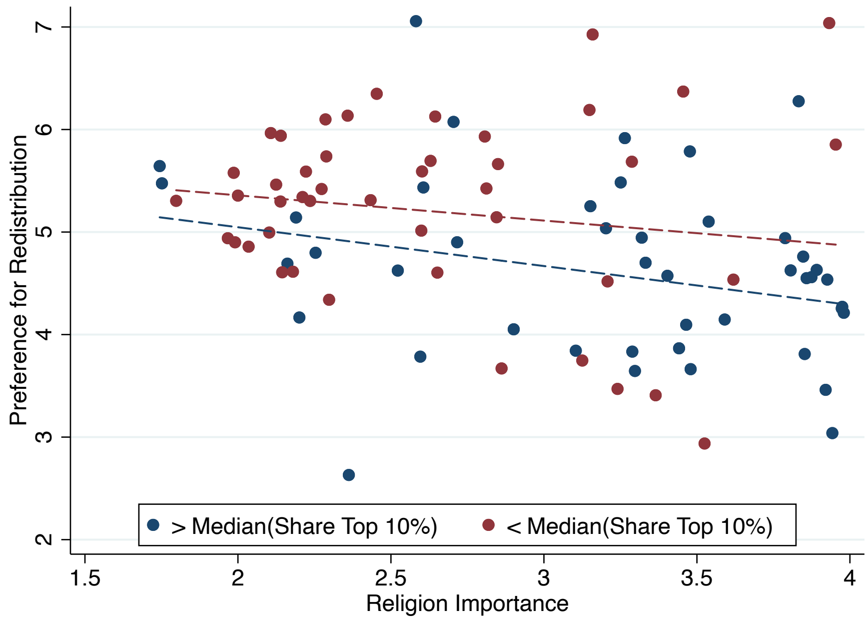

Figure 5: Importance of Religion vs. Preferences for Redistribution (2017-2022)
Source: Own elaboration with data from the Integrated Value Survey merging World Value Survey and the European Value Survey (1981-2022) and the World Inequality Database (1989-2023).
Lecture note: Figure 5 uses data from the last wave where the relevant questions were asked (2017-2022) and plots the mean importance of religion per country and wave – measured with question A006 of the survey – against the preference for redistribution – measured with question E035 of the survey – for 91 countries, and shows a decreasing relationship.

B Support for Assumption 1

Assumption 1 holds under many income distributions typically used in the literature, and for a relatively small number of agents. The objective is to identify the smallest odd population size n such that $w_n < \frac{n}{2}\, w_m$,. For odd n, let $m = (n+1)/2$. The rth order statistic of an i.i.d. sample of size n exhibits the following density:

$$f_{X_{(r)}}(x) = \frac{n!}{(r-1)!\,(n-r)!}\,\big[F(x)\big]^{\,r-1}\big[1-F(x)\big]^{\,n-r}\,f(x).$$

Therefore,

$$w_n = E[X_{(n)}] = \int x\, n\, F(x)^{\,n-1} f(x)\,dx, \quad w_m = E[X_{(m)}] = \int x\,\frac{n!}{(m-1)!\,(n-m)!}\,F(x)^{\,m-1}\big[1{-}F(x)\big]^{\,n-m} f(x)\,dx,$$

and Assumption 1 turns into:

$$E[X_{(n)}] \; < \; \frac{n}{2}\, E[X_{(m)}].$$

1. Uniform $[0,2]$

Here $F(x) = x/2,\; f(x) = 1/2$. A change of variable $u = x/2$ gives

$$E[X_{(n)}] = \frac{2n}{n+1}, \quad E[X_{(m)}] = 2\,\frac{m}{n+1} = 2\,\frac{(n+1)/2}{n+1} = \frac{n+1}{n+1} = 1.$$

Thus the inequality is

$$\frac{2n}{n+1} < \frac{n}{2}\cdot 1 \iff n > 3 \quad \Longrightarrow \quad n_{\min} = 5.$$

2. Exponential(1)

For $X \sim \mathrm{Exp}(1)$ one has

$$E[X_{(r)}] = \sum_{k=n-r+1}^{n} \frac{1}{k}.$$

Hence

$$E[X_{(n)}] = H_n, \quad E[X_{(m)}] = \sum_{k=n-m+1}^{n} \frac{1}{k}, \quad m = \frac{n+1}{2}.$$

Solving

$$H_n \; < \; \frac{n}{2} \sum_{k=n-(n+1)/2+1}^{n} \frac{1}{k} = \frac{n}{2} \sum_{k=(n-1)/2+1}^{n} \frac{1}{k}$$

numerically over odd n, yielding $n_{\min} = 9$.

3. Pareto(k), mean 1

With $x_{\min} = (k-1)/k$, the general formula is

$$E[X_{(r)}] = x_{\min}\, n\, B\Big(r,\, n-r+1-\tfrac{1}{k}\Big),$$

so

$$E[X_{(n)}] = x_{\min}\, n\, B\big(n, 1-\tfrac{1}{k}\big), \quad E[X_{(m)}] = x_{\min}\, n\, B\Big(m,\, n-m+1-\tfrac{1}{k}\Big).$$

The inequality becomes

$$B\big(n, 1-\tfrac{1}{k}\big) < \frac{n}{2}\, B\Big(m,\, n-m+1-\tfrac{1}{k}\Big),$$

which—for $k = 2$—first holds at $n_{\min} = 7$, and decrease as k increases.

4. Log-Normal$\left(\mu = -\frac{1}{2}\sigma^2,\ \sigma^2\right)$

Here

$$F^{-1}(p) = \exp\bigl(\mu + \sigma\Phi^{-1}(p)\bigr),$$

so

$$E[X_{(r)}] = \int_0^1 \exp(\mu + \sigma\Phi^{-1}(u))\ \frac{n!}{(r-1)!\,(n-r)!}\, u^{r-1}(1-u)^{n-r}\, du.$$

I set $r = n$ and $r = m = (n+1)/2$ in turn, and solve

$$\int_0^1 e^{\mu+\sigma z}\, n\, u^{n-1} du < \frac{n}{2} \int_0^1 e^{\mu+\sigma z}\ \frac{n!}{(m-1)!\,(n-m)!}\, u^{m-1}(1-u)^{n-m}\, du,$$

with $z = \Phi^{-1}(u)$. Numerical evaluation then yields, e.g. $n_{\min} = 5$ for $\sigma = 0.5$, $n_{\min} = 13$ for $\sigma = 1.0$, etc. The results are summarized in Table 2:

Distribution	Smallest odd n s.t. $w_n < \frac{n}{2}\, w_m$
Uniform$[0, 2]$	5
Exponential(1)	9
Pareto($k = 3$)	3
Pareto($k = 2$)	7
Pareto($k = 1.5$)	39
Log-Normal, $\sigma = 0.5$	5
Log-Normal, $\sigma = 1.0$	13
Log-Normal, $\sigma = 1.5$	117

Table 2: Minimal odd n so that $w_n < (n/2)\, w_m$, for various distributions with mean normalized to one.

C Theoretical Proofs without Moral Considerations

C.1 Proof Claim 1 - Consumption

Without voluntary contributions private consumption equals disposable income, and taxation then decreases or increases private consumption depending on the position on the income distribution:

$$\frac{\partial \tilde{x}_i}{\partial \tau} = -w_i + (1 - C')(1 - \nu)w_a \tag{34}$$

Agents with low income, $w_i < (1 - C')(1 - \nu)w_a \equiv \tilde{w}$, have a positive impact of taxation on private income. Evidently, a budget rule that favors the public good investment (larger ν) always decrease the private consumption of all agents.

$$\frac{\partial \tilde{x}_i}{\partial \nu} = -(\tau - C)w_a < 0 \tag{35}$$

Taxation, along with a budget rule that prioritizes public investment, consistently increase public-good provision.

$$\frac{\partial \tilde{Q}}{\partial \tau} = (1 - C')\nu n w_a > 0, \quad \frac{\partial \tilde{Q}}{\partial \nu} = (\tau - C)n w_a > 0 \tag{36}$$

C.2 Proof Lemma 1 - Median as Equilibrium

In their Proposition 3, De Donder et al. (2012) demonstrates that under marginal single crossing, the *Kramer-Shepsle* equilibrium coincides with the component-wise ideal point of the median. This condition indicates that the marginal utility of both dimensions increases or decreases monotonically with agents' income. Moreover, in their Proposition 4, the authors demonstrate that when the first-stage indirect utility also exhibits single crossing, then the *Kramer-Shepsle* and the *Stackelberg* equilibria coincide. The single crossing property of the first-stage indirect utility implies that an agent's best response in the dimension chosen first is monotonic with respect to income, accounting for the response in the other dimension. I will now prove that both Propositions hold in the model. With complete crowding out, the log-transformation of the utility of an agent i writes:

$$\tilde{u}(w_i, \tau, \nu) \equiv ln\left((\tilde{U}(w_i, \tau, \nu) \right) = (1-\alpha)\, ln\left((1-\tau)w_i + (\tau - C)(1-\nu)w_a \right) + \alpha\, ln\left((\tau - C)\nu W \right) \tag{37}$$

I utilize the log-transformation of utility, as it simplifies derivations without affecting the results. The first order condition that characterize the interior solutions write:

$$\nu : \quad \frac{\partial\, \tilde{u}}{\partial\, \nu} = -\frac{(1-\alpha)(\tau - C)w_a}{(1-\tau)w_i + (\tau - C)(1-\nu)w_a} + \frac{\alpha}{\nu} = 0 \tag{38}$$

$$\tau : \quad \frac{\partial\, \tilde{u}}{\partial\, \tau} = \frac{(1-\alpha)(-w_i + (1-C')(1-\nu)w_a)}{(1-\tau)w_i + (\tau - C)(1-\nu)w_a} + \frac{(1-C')\alpha}{\tau - C} = 0 \tag{39}$$

It is straightforward to demonstrate that the second-order conditions are negative for each component, which ensures that agents' preferences are single-peaked in each policy dimension taking the other as given. Moreover, the marginal single-crossing condition holds:

$$\frac{\partial^2\, \tilde{u}}{\partial\, w\, \partial\, \nu} = \frac{(1-\alpha)(\tau - C)(1-\tau)w_a}{\tilde{x_i}^2} > 0, \tag{40}$$

$$\frac{\partial^2\, \tilde{u}}{\partial\, w\, \partial\, \tau} = -\frac{(1-\alpha)\left(\tilde{x_i} + (-w_i + (1-C')(1-\nu)w_a)^2 \right)}{\tilde{x_i}^2} < 0 \tag{41}$$

Hence, by Proposition 3 in De Donder et al. (2012), the *Kramer-Shepsle* equilibrium coincides with the component-wise ideal point of the median agent. Next, following De Donder et al. (2012)'s proof of their Proposition 4, a sufficient condition for the *Stackelberg* equilibrium to remain consistent, regardless of the order, and to align with the *Kramer-Shepsley* equilibrium is that the first-stage indirect utility exhibits single crossing. Assume, without loss of generality, that τ is chosen first and then ν. Then, by backward induction and given that preferences are single-peaked in each component and monotone in income, the Condorcet winner ($\tilde{\nu_c}$) is that preferred by the agent with median income $\tilde{\nu_c}(\tau) = \nu(w_m, \tau)$. Defining $\tilde{V}(w_i, \tau) = \tilde{u}(w_i, \tau, \nu_c(\tau))$ as the first-stage indirect utility, single crossing implies that

$$\frac{\partial^2 \tilde{V}}{\partial \tau \partial w} = \frac{\partial^2 \tilde{u}}{\partial \tau \partial w} + \frac{\partial^2 \tilde{u}}{\partial \nu \partial w} \cdot \frac{\partial \nu_c}{\partial \tau} \tag{42}$$

has a unique sign, either positive or negative. This ensures that the *Stackelberg* equilibrium coincides with the component-wise ideal point of the agent with median income. Since each component is monotonic with respect to income, accounting for the response in the other component. Hence, given the signs of (40) and (41), if $\partial \nu_m / \partial \tau < 0$, then the first-stage indirect utility is single crossing (a similar argument holds when the order is reversed). Since $\nu_m(\tau)$ solves $\partial \tilde{u} / \partial \nu = 0$ and $\partial^2 \tilde{u} / (\partial \nu)^2 < 0$, the sign of $\partial \nu_m / \partial \tau$ corresponds to the sign of $\partial^2 \tilde{u} / \partial \nu \partial \tau$.

$$\frac{\partial^2 u}{\partial \tau \partial \nu} = -\frac{(1-\alpha)\big((1-\tau)(1-C') + \tau - C\big) w_i w_a}{\tilde{x_i}^2} < 0 \tag{43}$$

Hence, the *Stackelberg* equilibrium coincides with the component-wise ideal point of the median which is the *Kramer-Shepsley* equilibrium.

C.3 Proof Lemma 2 - Component-Wise Ideal Point

The first-order conditions (38) and (39) imply both (10) and (11), respectively. The ideal parameter, taking the other as given, write:

$$\tilde{\nu_i}(\tau) = \alpha \cdot \left(1 + \frac{(1-\tau)\phi_i}{\tau - C(\tau)}\right) \quad \text{and} \quad 1 - C(\tilde{\tau}_i(\nu)) = \frac{(1-\alpha)\big(\tilde{\tau}_i(\nu) - C(\tilde{\tau}_i(\nu))\big)\phi_i}{(1-\nu)\big(\tilde{\tau}_i(\nu) - C(\tilde{\tau}_i(\nu))\big) + \alpha \cdot (1 - \tilde{\tau}_i(\nu))\phi_i} \tag{44}$$

Assuming an interior solution such that both equations (10) and (11) hold with equality, and substituting one into the other yields the component-wise ideal point in (13). The comparative statics of this ideal point are:

$$\frac{\partial \tilde{\tau}_i}{\partial \alpha} = 0 \text{ and } \frac{\partial \tilde{\tau}_i}{\partial \phi_m} = -\frac{1}{\tilde{C''}} < 0 \tag{45}$$

$$\frac{\partial \tilde{\nu_i}}{\partial \alpha} = 1 + \frac{(1-\tilde{\tau}_i)\phi_m}{\tilde{\tau}_i - C(\tilde{\tau}_i)} > 0 \text{ and } \frac{\partial \tilde{\nu_i}}{\partial \phi_i} = \alpha \cdot \left(\frac{(1-\tilde{\tau}_i)(\tilde{\tau}_i - C(\tilde{\tau}_i))C''(\tilde{\tau}_i) + \phi_i(\tilde{\tau}_i - C(\tilde{\tau}_i) + \phi_i(1-\tilde{\tau}_i))}{C''(\tilde{\tau}_i)(\tilde{\tau}_i - C(\tilde{\tau}_i))}\right) > 0 \tag{46}$$

As the ideal share of the budget for public goods increases with income, the condition for an agent to prefer a share of the budget that finances the redistributive policy, *i.e.*, $\tilde{\nu}_i < 1$, is expressed as follows:

$$\left(\frac{\alpha}{1-\alpha}\right) < \left(\frac{\tilde{\tau}_i - C(\tilde{\tau}_i)}{1-\tilde{\tau}_i}\right)\left(\frac{w_a}{w_i}\right) = \left(\frac{C'^{-1}(1-\phi_i) - C(C'^{-1}(1-\phi_i))}{1 - C'^{-1}(1-\phi_i)}\right)\left(\frac{1}{\phi_i}\right) \equiv \Omega(\phi_i) \tag{47}$$

where $\Omega(\phi_i)$ is a decreasing function of ϕ_i and $\Omega(1) = 0$. Defining $\overline{\phi}$ such that $\Omega(\overline{\phi}) = \frac{\alpha}{1-\alpha}$, then $\overline{\phi} < 1$. For high-income agents, $\phi_i \geq \overline{\phi}$, their ideal budget share is to finance entirely the public investment in the public good, $\tilde{\nu} = 1$, and their ideal tax rate writes:

$$1 - C'(\tilde{\tau}) = \left(\frac{1-\alpha}{\alpha}\right)\left(\frac{\tilde{\tau} - C(\tilde{\tau})}{1-\tilde{\tau}}\right) \tag{48}$$

C.4 Proof Proposition 1 - Political Equilibrium

From Lemma 1, the equilibrium is given by the component-wise ideal point of the agent with median income. Since the preference for the public good is assumed to be low ($\alpha \ll 1/2$), and $\Omega(\phi_i)$ is a decreasing function of ϕ_i, then by (47) $\overline{\phi}$ is close to 1. Hence, it is reasonable to conclude that $\phi_m < \overline{\phi} < 1$ such that the political equilibrium can be expressed as (15). The comparative statics with respect to α and ϕ_m are identical to those in (45) and (46).

C.5 Proof Corollary 1 - Equilibrium Public Good Provision

From Proposition 1, in equilibrium the provision of the public good and private consumption are given by (18) and (19), respectively . The comparative statics write:

$$\frac{\partial \tilde{Q}^*}{\partial \alpha} = W\big((1-\tilde{\tau^*})\phi_m + \tilde{\tau^*} - C(\tilde{\tau^*})\big) > 0 \tag{49}$$

$$\frac{\partial \tilde{Q}^*}{\partial \phi_m} = \alpha W\big((1-\tilde{\tau^*}) - \frac{1}{C''(\tilde{\tau^*})}\big(1 - \phi_m - C'(\tilde{\tau^*})\big) = \alpha \cdot (1-\tilde{\tau^*})W > 0 \tag{50}$$

$$\frac{\partial \tilde{x_i^*}}{\partial \alpha} = -\big((1-\tilde{\tau^*})\phi_m + \tilde{\tau^*} - C(\tilde{\tau})\big)w_a < 0 \tag{51}$$

$$\frac{\partial \tilde{x_i^*}}{\partial \phi_m} = -\left(\frac{\phi_m - \phi_i}{C''(\tilde{\tau^*})} + (1-\tilde{\tau^*})\alpha\right) w_a \lesseqqgtr 0 \quad \text{iff} \quad \phi_i \lesseqqgtr \phi_m + (1-\tilde{\tau^*})\alpha C''(\tilde{\tau^*}) \tag{52}$$

Hence, under Cobb-Douglass preferences, the utility of agent i writes:

$$\tilde{V_i} = [(1-\tilde{\tau^*})w_i - (1-\tilde{\tau^*})\alpha w_m + (1-\alpha)(\tilde{\tau^*} - \tilde{C})w_a]^{1-\alpha} \cdot [\alpha n \cdot ((1-\tilde{\tau^*})w_m + (\tilde{\tau^*} - \tilde{C})w_a)]^{\alpha} \tag{53}$$

D Theoretical Proofs with Moral Considerations

D.1 Proof Lemma 3 - Contribution Rate

The first order condition of the problem for a *Kantian* agent writes:

$$\text{Marginal Benefit} \leftarrow \sum_{j=1}^{n} y_j U_Q^i \leq y_i U_x^i \rightarrow \text{Marginal Cost}$$
$$MRS_i \equiv \left(\frac{\alpha}{1-\alpha}\right)\left(\frac{x_i}{Q}\right) \leq \frac{y_i}{\sum_{j=1}^{n} y_j}$$

Solving for the individual contribution rate an agent i I find $k^* = \alpha - \frac{(1-\alpha)I}{Y}$, where $Y = \sum_{j=1}^{n} y_j$. Replacing (6) and overall disposable income (Y) in the optimal contribution rate I find:

$$k^* = max\{0, \alpha - \frac{\nu \cdot (\tau - C)(1-\alpha)}{1 - C - \nu \cdot (\tau - C)}\}$$

If $F(\tau, \nu) \equiv \frac{(\tau - C)\nu}{1-C} < \alpha$, then $k^* > 0$, and

$$\frac{\partial F}{\partial \tau} = \nu \cdot \left(\frac{(1-C)(1-C') + C' \cdot (\tau - C)}{(1-C)^2}\right) > 0 \text{ and } \frac{\partial F}{\partial \nu} = \frac{\tau - C}{1-C} > 0$$

D.2 Proof Claim 2 - Private and Public Consumption

Aggregating the individual contributions, I find the overall provision of the public good in (24) and the level of private consumption in (25). The effect of the policy parameters on overall supply depends on whether agents voluntarily contribute. If agents contribute voluntarily ($F(\tau, \nu) < \frac{\alpha}{1-\alpha}$), the provision of the public good decreases with taxation, while the share allocated to the public good has no effect:

$$\frac{\partial \hat{Q}}{\partial \tau} = -\alpha\, C'(\tau) W < 0 \ , \ \frac{\partial \hat{Q}}{\partial \nu} = 0 \tag{54}$$

If individuals fail to contribute ($F(\tau, \nu) \geq \frac{\alpha}{1-\alpha}$), taxation and the budget share allocated to the public good consistently increase its provision:

$$\frac{\partial \hat{Q}}{\partial \tau} = (1 - C')\nu W > 0 \ , \ \frac{\partial \hat{Q}}{\partial \nu} = (\tau - C) W > 0$$

Given optimal contributions, the private consumption of a kantian agent with income w_i is characterized by (25). Replacing public investment and overall disposable income gives us:

$$\hat{x}_i = \begin{cases} \left(\frac{(1-\alpha)(1-C)}{1 - C - \nu \cdot (\tau - C)}\right)((1-\tau)w_i + (\tau - C)(1-\nu)w_a) & \text{if} \quad F(\tau, \nu) < \frac{\alpha}{1-\alpha} \\ (1-\tau)w_i + (\tau - C)(1-\nu)w_a & \text{otherwise} \end{cases} \tag{55}$$

The impact of the budget rule on private consumption when agents are not contributing is always negative. When agents contribute it depends on the ordering of their income with respect to the average:

$$\frac{\partial \hat{x}_i}{\partial \nu} = \left(\frac{(1-\alpha)(1-C)(\tau - C)(1-\tau)(w_i - w_a)}{(1 - C \cdot (1-\nu) - \tau\nu)^2} \right) > 0 \text{ iff } w_i > w_a \tag{56}$$

The impact of taxation on private consumption is more complex. It can be then decomposed in the effect coming through disposable income (Nashian consumption) and the effect coming through the contribution rate:

$$\frac{d\hat{x}_i}{d\tau} = \begin{cases} \left(\dfrac{1-\alpha}{A^2}\right)[\theta_1 \cdot (1-\nu)w_a - \theta_2 w_i] & \text{if} \qquad F(\tau,\nu) < \frac{\alpha}{1-\alpha} \\ \\ -w_i + (1 - C'(\tau))(1-\nu)w_a & \text{otherwise} \end{cases}$$

where

$$A = 1 - C \cdot (1-\nu) - \nu\tau$$
$$\theta_1 = (1-C')(1-C)^2 + \nu C' \cdot (\tau - C)^2 > 0$$
$$\theta_2 = (1-\nu)(1-C)^2 + \nu C' \cdot (1-\tau)^2 > 0$$

When moral agents contribute to the public good the effect of taxation on private consumption is complex and non-monotonic. However, if an agent experiences a positive effect of taxation on disposable income, the overall effect of taxation on private consumption will also be positive. Hence, if $w_i \leq (1-C')(1-\nu)w_a \equiv \tilde{w}$, then $\frac{d\hat{x}_i}{d\tau} > 0$. Even more, it can be shown that an agent with income equal or above average has always a negative effect of taxation on private consumption. Hence, if $w_i \geq w_a$, then $\frac{d\hat{x}_i}{d\tau} < 0$. For agents with income between these income boundaries, $(1-C')(1-\nu)w_a < w_i < w_a$, the effect of taxation depends on the tax rate itself and on the budget rule in place.

$$sign\left[\frac{d\hat{x}_i}{d\tau}\right] = sign\left[((1-C')(1-C)^2 + \nu C'(\tau - C)^2)(1-\nu)w_a - ((1-\nu)(1-C)^2 + \nu C'(1-\tau)^2)w_i\right] \tag{57}$$

This expression is largely simplified given the budget rule chosen in equilibrium ($\hat{\nu^*} = 0$):

$$sign\left[\frac{d\hat{x}_i}{d\tau}\right] = sign\left[(1-C')w_a - w_i\right] \tag{58}$$

However, I will retain the sufficient conditions for now.

D.3 Proof of Lemma 4 - Median as Equilibrium

Considering positive contributions, the log transformation of the utility of an agent i, putting together all constant terms that are neither policy-related nor individually dependent as H, writes:

$$\hat{u}(w_i,\tau,\nu) = (1-\alpha)\big(\, ln\,\big((1-\tau)w_i + (\tau - C)(1-\nu)w_a\big) \,-\, ln\,\big(1 - C - \nu\cdot(\tau - C)\big)\,\big) \,+\, \alpha\, ln\,\big(\,1 - C\,\big) + H \tag{59}$$

The corresponding first-order conditions write:

$$\nu:\quad \frac{\partial\,\hat{u}}{\partial\,\nu} = \left(\frac{(1-\alpha)(1-\tau)(\tau-C)(w_i - w_a)}{\big(1-C-(\tau-C)\nu\big)\big((1-\tau)w_i + (\tau-C)(1-\nu)w_a\big)}\right) \lesseqqgtr 0 \tag{60}$$

$$\tau:\quad \frac{\partial\,\hat{u}}{\partial\,\tau} = \frac{(1-\alpha)(1-\nu)\big((1-\tau)(1-C') + \tau - C\big)\big(w_a - w_i\big)}{\big(1-C-\nu(\tau-C)\big)\big((1-\tau)w_i + (\tau-C)(1-\nu)w_a\big)} - \frac{C'}{1-C} \leq 0 \tag{61}$$

From (60) the ideal share for the public good is a corner solution for all agents. It is zero for agents below the average income and one for those above it, regardless of the value of the tax rate. Moreover, from (61), agents with income above the average have an ideal tax rate equal to zero, hence, their ideal policy parameters imply having no policies at all. Focusing on agents below the average income, marginal single-crossing holds:

$$\frac{\partial^2\,\hat{u}}{\partial\,w\,\partial\,\nu} = \frac{(1-\alpha)(1-\tau)(\tau-C)w_a}{\hat{y_i}^2} > 0, \tag{62}$$

$$\frac{\partial^2\,\tilde{u}}{\partial\,w\,\partial\,\tau} = -\frac{(1-\alpha)(1-\nu)\big((1-\tau)(1-C') + \tau - C\big)w_a}{\hat{y_i}^2} < 0 \tag{63}$$

Hence, the *Kremer-Shepsley* equilibrium coincides with ideal policy point of the agent with median income. Moreover, from (60), it is evident that, regardless of the order, the Condorcet winner of the vote on the budget share will always be to entirely fund the redistributive policy, as agents with incomes below the average are more numerous. Agents anticipate this and, as (63) remains negative at $\nu = 0$, then the *Stackelberg* equilibrium matches the ideal policy parameters of the agent with median income.

D.4 Proof Lemma 5 - Component-Wise Ideal Point

From (60) I know that the ideal budget share of low-income agents is $\hat{\nu} = 0$. Replacing this in (61), allows me to find the ideal policy parameters of low-income agents characterized in (26). Since $\Psi(\hat{\tau}_i)$ is a fraction (N/D), the signs of its derivatives with respect to $\hat{\tau}_i$ and b are given by $N_\tau D - D_\tau N$ and $N_\alpha D - D_\alpha N$, respectively. Hence, after some lengthy algebra,

$$sign\left(\frac{\partial\Psi}{\partial\hat{\tau}_i}\right) = -sign\left(\ (\alpha C''(\tilde{\tau}_i)(1-\tilde{\tau}_i)+C'(\tilde{\tau}_i))(\alpha C'(\tilde{\tau}_i)(1-\tilde{\tau}_i)+(1-\alpha)(1-C(\tilde{\tau}_i)))\ \right) = Negative \tag{64}$$

$$sign\left(\frac{\partial\Psi}{\partial\alpha}\right) = -sign\left(\ C'(\tilde{\tau}_i)(1-C(\tilde{\tau}_i))\,(1-C(\tilde{\tau}_i)-C'(\tilde{\tau}_i)(1-\tilde{\tau}_i))\ \right) = Negative \tag{65}$$

As $\partial\Psi/\partial\tilde{\tau}_i < 0$, for (26) to hold, $\partial\tilde{\tau}_i/\partial\phi_i < 0$ must be satisfied. To study the effect of the preference for the public good on the tax rate, I employ the implicit function theorem in the context of (26).

$$\frac{d\,\Psi}{d\,\alpha} = \frac{\partial\Psi}{\partial\alpha} + \frac{\partial\Psi}{\partial\hat{\tau}_i}\frac{\partial\hat{\tau}_i}{\partial\alpha} = 0 \Rightarrow \frac{\partial\hat{\tau}_i}{\partial\alpha} = -\frac{\partial\Psi/\partial\alpha}{\partial\Psi/\partial\tilde{\tau}_i} < 0 \tag{66}$$

The preferred tax rate for agents decreases with income and with the taste for the public good. By Lemma 4 the political equilibrium can be represented as (27). The comparative statics were described just before.

D.5 Proof Corollary 2 - Equilibrium Public Good Provision

From Proposition 2, in equilibrium the provision of the public good and private consumption are given by (28) and (29), respectively . The comparative statics write:

$$\frac{\partial\hat{Q}^*}{\partial\alpha} = (1-C(\hat{\tau^*}))W > 0 \tag{67}$$

$$\frac{\partial\hat{Q}^*}{\partial\phi_m} = -\left(\frac{\partial\hat{\tau^*}}{\partial\phi_m}\right)C'\alpha W > 0 \tag{68}$$

$$\frac{\partial\hat{x_i^*}}{\partial\alpha} = -\big((1-\hat{\tau^*})\phi_i + \hat{\tau^*} - C(\hat{\tau^*})\big)w_a + \big(\phi_m+\Delta_\tau-\phi_i\big)(1-\alpha)\left(\frac{\partial\hat{\tau^*}}{\partial\alpha}\right)w_a \lesseqgtr 0 \tag{69}$$

$$\frac{\partial\hat{x_i^*}}{\partial\phi_m} = \big(\phi_m+\Delta_\tau-\phi_i\big)(1-\alpha)\left(\frac{\partial\hat{\tau^*}}{\partial\phi_m}\right)w_a \lesseqgtr 0 \quad \text{iff} \quad \phi_i \lesseqgtr \phi_m+\Delta_\tau \tag{70}$$

Although it is not possible to directly sign the effects of preferences on private consumption, note that a sufficient condition for $\frac{\partial\hat{x_i^*}}{\partial\alpha} < 0$ is $\phi_i < \phi_m + \Delta_\tau < 1$.

Hence, under Cobb-Douglass preferences, the utility of agent i writes:

$$\hat{V_i} = [(1-\alpha)\left((1-\hat{\tau^*})w_i + (\hat{\tau^*}-C(\hat{\tau^*}))w_a\right)]^{1-\alpha}\cdot[\alpha\cdot(1-C(\hat{\tau^*}))W]^{\alpha} \tag{71}$$

E Ex-Post Analysis

E.1 Proof of Proposition 3 - Comparison of Political Equilibria

From Propositions 1 and 2, it is evident that $\tilde{\nu^*} > \hat{\nu^*}$, and the signs of their derivatives are $\partial\tilde{\nu^*}/\partial\alpha > \partial\hat{\nu^*}/\partial\alpha = 0$, and $\partial\tilde{\nu^*}/\partial\phi_m > \partial\hat{\nu^*}/\partial\phi_m = 0$. Hence, an increase in the preferences for the public good, or a reduction in inequality increases the difference in the budget share of both societies. Similarly, the equilibrium tax rates solve:

$$1 - C'(\tilde{\tau^*}) = \phi_m \quad \text{and} \quad 1 - C'(\hat{\tau^*}) = \phi_m + \Delta_\tau \tag{72}$$

with $\Delta_\tau = \frac{\alpha C' \cdot ((1-\tau)\phi_m + \tau - C)}{(1-\alpha)(1-C)} > 0$. Since the deadweight loss from taxation is an increasing and convex function, then $C'(\tau)$ is an increasing function, and $\tilde{\tau^*} > \hat{\tau^*}$. Regarding comparative statics, stronger preference for the public good increase the difference in tax rates $\partial\hat{\tau^*}/\partial\alpha < \partial\tilde{\tau^*}/\partial\alpha = 0$; however, both tax rates decrease with a reduction in inequality, and the effect on the difference remains ambiguous. Differentiating (72) with respect to income:

$$\frac{\partial(\tilde{\tau^*} - \hat{\tau^*})}{\partial \phi_m} = \left(-\frac{1}{C''(\tilde{\tau^*})}\right) - \left(-\frac{1 + \frac{\partial \Delta_\tau}{\partial \phi_m}}{C''(\hat{\tau^*}) + \frac{\partial \Delta_\tau}{\partial \tau}}\right) \lesseqqgtr 0 \tag{73}$$

where

$$\frac{\partial \Delta_\tau}{\partial \phi_m} = \frac{(1-\tau)\alpha C'}{(1-\alpha)(1-C)} > 0 \quad \text{and} \quad \frac{\partial \Delta_\tau}{\partial \tau} = \frac{\alpha\big((1-\tau)\phi_m + \tau - C\big)\big((1-C)C'' + (1 + \frac{\alpha}{1-\alpha})(C')^2\big)}{(1-\alpha)(1-C)^2} > 0 \tag{74}$$

I am able to sign this effect, for small deadweight loss of taxation, by Taylor approximations of the dead-weight loss of taxation and its derivative around zero. The second order Taylor expansions write $C(\tau) \approx C(0) + C'(0)\tau + \frac{1}{2}C''(0)\tau^2$, and $C'(\tau) \approx C'(0) + C''(0)\tau + \frac{1}{2}C'''(0)\tau^2$. Using the properties of the dead-weight loss function, replacing in the equilibrium tax rates in (15) and (27), and ignoring the second order terms:

$$\tilde{\tau^*} \approx \frac{1 - \phi_m}{C''(0)} \quad \text{and} \quad \hat{\tau^*} \approx \frac{(1-\alpha)(1-\phi_m)}{(1-\alpha+\alpha\phi_m))C''(0)} = \frac{(1-\alpha)\tilde{\tau^*}}{1-\alpha+\alpha\phi_m} \tag{75}$$

As $\frac{1-\alpha}{1-\alpha+\alpha\phi_m} < 1$, this again implies $\tilde{\tau^*} > \hat{\tau^*}$, and $\partial\hat{\tau^*}/\partial\alpha < \partial\tilde{\tau^*}/\partial\alpha = 0$. The effect of inequality on the approximated tax rates is given by:

$$\frac{\partial \tilde{\tau^*}}{\partial \phi_m} \approx -\frac{1}{C''(0)} < -\frac{(1-\alpha)}{(1-\alpha+\alpha\phi_m)^2 C''(0)} \approx \frac{\partial \hat{\tau^*}}{\partial \phi_m} < 0 \tag{76}$$

Hence, for a small deadweight loss of taxation, inequality increases the difference in the equilibrium tax rates.

E.2 Proof Lemma 6 - Private Consumption Comparison

Private consumption of an agent i in equilibrium in both societies is represented by (19) and (29), and the difference is given by (30). By employing second-order Taylor approximations for the deadweight loss and the tax rates in (75), I rewrite A and B as:

$$A = \alpha\left(\frac{(1-\phi_m)\,(1+\phi_m-\alpha)}{(1-\alpha+\alpha\phi_m)C''(0)} - 1\right) \tag{77}$$

$$B = \alpha\phi_m\left(1 - \frac{(1-\phi_m)\,(\,2(1-\alpha)+\alpha\phi_m\,)}{(1-\alpha+\alpha\phi_m)C''(0)}\right) \tag{78}$$

Defining $c = C''(0)$, from (77) and (78), I conclude that $A > 0$ if and only if $c < r(\phi_m, \alpha)$, and $B > 0$ if and only if $c > s(\phi_m, \alpha)$ with $r(\phi_m, \alpha)$ and $s(\phi_m, \alpha)$ defined in (31). I can easily demonstrate that $r(\phi_m, \alpha) < s(\phi_m, \alpha)$. Subsequently, three possible scenarios emerge:

i) If $c < r(\phi_m, \alpha)$, then $A > 0$, $B < 0$, and $\overline{\Phi} > 0$, and agents with $\phi_i < \overline{\Phi}$ have larger private consumption in a society without moral considerations.

ii) If $r(\phi_m, \alpha) < c < s(\phi_m, \alpha)$, then $A < 0$, $B < 0$, and $\overline{\Phi} < 0$, and all agents have larger private income in a society without moral considerations.

iii) If $s(\phi_m, \alpha) < c$, then $A < 0$, $B > 0$, and $\overline{\Phi} > 0$, and agents with $\phi_i > \overline{\Phi}$ have larger private consumption in a society without moral considerations.

E.3 Proof Proposition 4 - Comparative Statics Private Consumption

The impact of individuals' taste for the public good and the ex-ante inequality on $r(\phi_m, \alpha)$ write:

$$\frac{\partial r}{\partial \alpha} = -\frac{(1-\phi_m)\phi_m^2}{(1-\alpha(1-\phi_m))^2} < 0 \quad \text{and} \quad \frac{\partial r}{\partial \phi_m} = -\frac{(2(1-\alpha)+\alpha\phi_m)\phi_m}{(1-\alpha(1-\phi_m))^2} < 0 \tag{79}$$

The impact of the taste for the public good and the ex-ante inequality on $s(\phi_m, \alpha)$ write:

$$\frac{\partial s}{\partial \alpha} = -\frac{(1-\phi_m)\phi_m}{(1-\alpha+\alpha\phi_m)^2} < 0 \tag{80}$$

$$\frac{\partial s}{\partial \phi_m} = -\frac{(2(1-\alpha)+\alpha\phi_m)(1-\alpha+\alpha\phi_m)+(1-\phi_m)(1-\alpha)\alpha}{(1-\alpha+\alpha\phi_m)^2} < 0 \tag{81}$$

Furthermore, the range in which the dead-weight loss ensures that all agents experience a higher level of private consumption in society without moral (second scenario) can be represented by:

$$t(\phi_m, \alpha) \equiv s(\phi_m, \alpha) - r(\phi_m, \alpha) = \frac{(1-\alpha)(1-\phi_m)^2}{1-\alpha+\alpha\phi_m} \tag{82}$$

with

$$\frac{\partial t}{\partial \alpha} = -\frac{\phi_m(1-\phi_m)^2}{(1-\alpha+\alpha\phi_m)^2} < 0 \tag{83}$$

$$\frac{\partial t}{\partial \phi_m} = -\frac{(1-\phi_m)(1-\alpha)(2-\alpha(1-\phi_m))}{2(1-\alpha(1-\phi_m))^2(1-\alpha+\phi_m)^2} < 0 \tag{84}$$

E.4 Proof Proposition 5 - Ex-post Inequality

As all ratios are equivalent, I focus on disposable income. The relative measure is the ratio between the disposable income of an agent with average income and that of an agent with median income, $\sigma^y = y_a/y_m$. Given the equilibrium shares, $\hat{\nu^*} = \alpha \cdot \left(1 + \frac{(1-\tilde{\tau^*})\phi_m}{\tilde{\tau^*}-C(\tilde{\tau^*})}\right)$ and $\hat{\nu^*} = 0$, the disposable income of an agent i, may be expressed without and with moral considerations as $\tilde{y_i} = (1-\tilde{\tau^*})w_i - \alpha \cdot (1-\tilde{\tau^*})w_m + (1-\alpha)(\tilde{\tau^*} - \tilde{C})w_a$ and $\hat{y_i} = (1-\hat{\tau^*})w_i + (\hat{\tau^*} - \hat{C})w_a$, respectively. Then, the corresponding inequality measures can be expressed as:

$$\tilde{\sigma^y} = \frac{(1-\tilde{C}) - \alpha(\tilde{\tau^*} - \tilde{C} + (1-\tilde{\tau^*})\phi_m)}{(1-\alpha)((1-\tilde{\tau^*})\phi_m + \tilde{\tau^*} - \tilde{C})} \quad \text{and} \quad \hat{\sigma^y} = \frac{(1-\alpha)(1-\hat{C})}{(1-\alpha)((1-\hat{\tau^*})\phi_m + \hat{\tau^*} - \hat{C})} \tag{85}$$

Both expression have equivalent denominators that only differ in the tax rate. Defining $D(\tau) = (1-\tau)\phi_m + \tau - C$, the derivative of the denominator with respect to the tax rate writes $\partial D/\partial\tau = -\phi_m + 1 - C'$, which is positive for any tax rate below $\tilde{\tau}^*$, then the denominator in the inequality measure when Kantian is smaller, $\hat{D} < \tilde{D}$. Hence, defining N as the numerator of σ^y, a sufficient condition to have higher inequality on disposable income in the society with moral considerations is $\hat{N} \geq \tilde{N}$ which simplifies to:

$$C(\tilde{\tau^*}) - C(\hat{\tau^*}) \geq \frac{\alpha \cdot (1-\tilde{\tau^*})(1-\phi_m)}{1-\alpha} \tag{86}$$

If the differences in the efficiency loss of both societies is large enough, the inequality of disposable income in the society with moral considerations is always higher. Using the second order Taylor expansion to approximate the dead-weight loss function, and the approximation of the tax rate without moral considerations in (75), I am able to rewrite this condition in terms of exogenous parameters as:

$$C''(0) \;\leq\; (1-\phi_m)\left(1 + \frac{(1-\alpha)\,\phi_m\big(2(1-\alpha) + \alpha\phi_m\big)}{2\big(1-\alpha(1-\phi_m)\big)^2}\right) \equiv g(\phi_m, b) \tag{87}$$

Hence, the society with moral considerations towards the public good is more unequal under the relative measure of disposable income inequality if the dead-weight loss of taxation is not too convex. I am able to show that the upper bound on the convexity increases with ex-ante inequality, measured by the inverse of ϕ_m, and decreases with the taste for the public good.

$$\begin{aligned}
\frac{\partial g}{\partial \phi_m} &= -\phi_m \left(\frac{\alpha(1+\alpha)(\alpha\phi^2 + 3(1-\alpha)\phi_m) + 2(1-\alpha)^2(2+\alpha))}{2\big(1-\alpha(1-\phi_m)\big)^3} \right) < 0 \\
\frac{\partial g}{\partial \alpha} &= -\left(\frac{\phi_m^2(1-\phi_m)(3(1-\alpha)+\alpha\phi_m)}{2\big(1-\alpha(1-\phi_m)\big)^3} \right) < 0
\end{aligned} \tag{88}$$

Furthermore, using (31) and (87), and performing some algebra, $r(\phi_m, \alpha) > g(\phi_m, \alpha)$. This means that if inequality is higher in the society with moral considerations, then low-income agents have lower consumption, and actually it is the main driver of the inequality result.

F Monte Carlo Simulations

Incomes are assumed to follow a lognormal distribution. To define the parameter σ I use data from the World Inequality Database of the average pre-tax national income of the 50th percentile and the overall average for 193 countries in 2023. Figure 2 plots the empirical density $\hat{f}(\phi)$ of the observed median-to-mean ratios $\{\phi_{m,i}\}_{i=1}^n$ using a kernel density estimator and its corresponding cumulative distribution function. However, pre-tax national income data is given in equal-split among adults, and Garbinti and Goupille-Lebret (2020) showed that such data underestimates inequality. In addition, Remington (2023), using wealth data, showed that most countries have a median to mean ratio lower than 0,4 in 2020. For this reason, in each Monte Carlo iteration, I include a leftward shift in ϕ_m to account for the underestimation of inequality in the data. More precisely, first because preferences for the public good are challenging to measure, I assume that the parameter α is drawn from a uniform distribution between 0.05 and 0.25. I form the corresponding cumulative distribution function.

$$\hat{F}(\phi) \;=\; \int_0^{\phi} \hat{f}(t)\,\mathrm{d}t \quad \text{with} \quad \hat{F}(1) = 1.$$

Then, to draw a random ratio, I sample $u \sim \mathcal{U}(0, x)$ with $x = F(\overline{\phi}(\alpha))$ as the upper limit, and set

$$\phi_m^{\text{draw}} \;=\; \hat{F}^{-1}(u) \;-\; \varepsilon,$$

where $\varepsilon \geq 0$ represents the leftward shift. Finally, I transform this shifted draw into the lognormal scale by

$$\sigma \;=\; \sqrt{-2\,\ln\!\big(\phi_m^{\text{draw}}\big)}, \quad \mu \;=\; \ln(\text{median target}),$$

and draw the agent incomes $w_i \sim \mathrm{LogNormal}(\mu, \sigma)$ for use in the simulations. The median target is the average median income in the sample which in United States Dollars of 2023 is \$19,470.

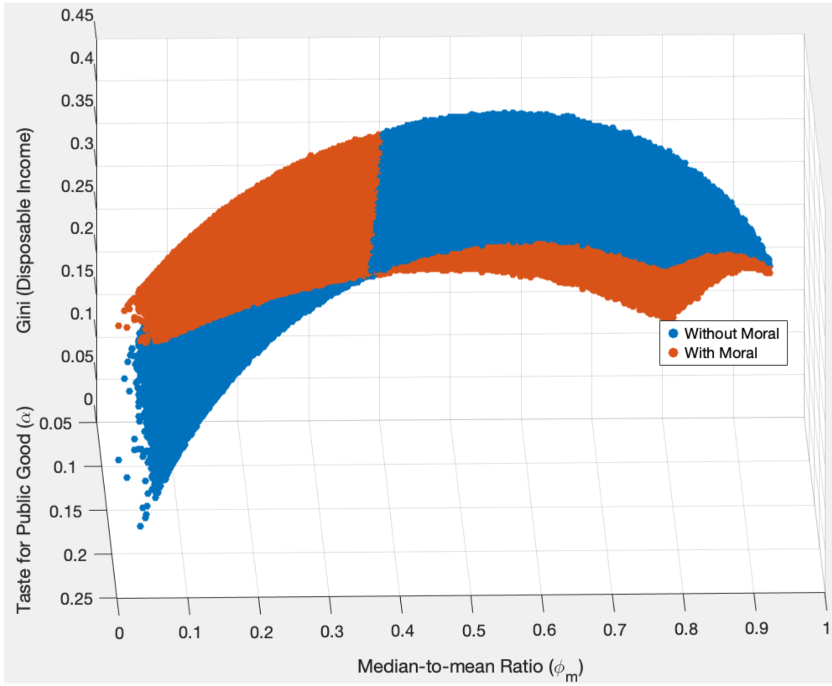

Figure 6: Gini Disposable Income / Private Consumption vs. Parameters
Source: Own elaboration with 100,000 draws under the assumption of quadratic dead-weight loss
Lecture note: Figure 6 plots the Monte Carlo simulated Gini of disposable income/ private consumption against ex-ante inequality (measured by the inverse of ϕ_m) and the taste for the public good (α). Evidently, inequality is higher in a society with moral considerations when the ex-ante inequality is high and the taste for the public good is low.