The Altruistic Rich? Inequality and Other-Regarding Preferences for Redistribution

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ABSTRACT

What determines support among individuals for redistributive policies? Do individuals care about others when they assess the consequences of redistribution? This article proposes a model of other-regarding preferences for redistribution, which we term *income-dependent altruism*. Our model predicts that an individual's preferred level of redistribution is decreasing in income, increasing in inequality, and, more importantly, that the inequality effect is increasing in income. Thus, even though the rich prefer less redistribution than the poor, the rich are more responsive, in a positive way, to changes in inequality than are the poor. We contrast these results with several other prominent alternatives of other-regarding behavior. Using data for the United States from 1978 to 2010, we find significant support for our claims.

What determines support for redistributive tax-and-transfer policies? Standard political economy models frequently portray individuals as merely self-interested: they care only about how redistribution affects their personal

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material welfare. Yet widespread dissatisfaction exists with this approach. Surely, the argument goes, more than self-interest enters into citizens' redistribution preferences, especially since these policies often have significant support among some of the wealthy.

This article develops a model of altruistic preferences for redistribution, compares its predictions with some influential alternatives, and then tests these alternatives with individual-level survey data. Our model makes distinct and novel predictions about the effects of income, inequality, and their interaction on the demand for redistributive social policies. We find the data to be more consistent with our theory than these prominent competing models.

We can summarize our main theoretical argument as follows. Because individuals care about their own welfare, the (relatively) poor support redistribution more than the (relatively) rich, as in the familiar self-interested approach. We call this the *relative income* effect. However, because individuals are also other-regarding, there are two additional implications of our theory, which can be understood as effects of changes in the level of *macro-inequality*. Each of these implications depends on the idea that people have a diminishing marginal utility for consumption, that is, that a richer person values an additional dollar of consumption less than a poorer person. First, an increase in macro-inequality will lead to more support for redistribution from *all* individuals. While an increase in inequality reduces social welfare (because the rich value an additional dollar less than the poor), an increase in redistribution increases social welfare (for the same reason). Therefore, because individuals are altruistic — meaning that they are concerned about social welfare — they will support more redistribution in response to an increase in inequality. The second, more interesting and less obvious, implication is that an increase in macro-inequality will lead to a *larger* increase in support for redistribution from the rich than from the poor. In this case, because the rich value an additional dollar less than the poor, an increase in redistribution aimed at reducing inequality is less costly (in welfare terms) to a richer person than to a poorer person. Hence, we label our theory *income-dependent altruism*.

The possibility that other-regarding concerns influence redistribution preferences has received increasing amounts of attention in the recent political economy literature (see, e.g., Cavaillé and Trump, 2015; Lupu and Pontusson,

2011; Shayo, 2009). In addition, there is neural evidence that individuals have a dislike for unequal distributions, independent of social image or potential reciprocity motivations. Tricomi *et al.* (2010) use functional magnetic resonance imaging to test directly for the presence of inequality-averse social preferences in the human brain. In laboratory experiments, individuals have been shown to have concerns for the welfare of others (see, for example, Charness and Rabin, 2002; Fehr and Gächter, 2000). We welcome this attention, but in this article we heed the admonition of Alesina and Giuliano (2011, p. 94) that "altruism is not an unpredictable 'social noise' to be randomly sprinkled over individuals." In order to advance the research in this area, and to adjudicate between competing approaches, theories of altruistic behavior need to be systematized into predictable hypotheses. Some of the most prominent approaches to altruism include Alesina and Angeletos (2005) and Fehr and Schmidt (1999). We show that each of these theories has implications very distinct from our own.

To test these implications, we focus on the effects of inequality in the United States. Inequality and redistribution in America have received a resurgence in academic interest in recent times. Bartels (2009) has shown the spectacular increase in inequality over the past 35 years to be the product of policy choices in a political system dominated by partisanship and particularly receptive to the preferences of the wealthy. Hacker and Pierson (2011) coincide not only in the appreciation of the attention that policy-makers pay to the rich (and not the poor) in America, but also about the fact that politics is the main factor behind inequality ("American politics did it"). But we still know too little about the demand for redistribution. In fact, we agree with McCarty et al. when they argue that:

> "Although much recent work in comparative political economy has sought to link inequality to political conflict and back to economic policy, few of these insights have been applied to American politics." (McCarty *et al.*, 2008, p. 73).

Before proceeding, we wish to make two clarifications. First, in general, one can contrast two approaches to altruism: the first analyzes altruism as an individual characteristic (personality trait,[1] "taste for giving"[2]) while the second understands other-regarding concerns to be affected by a situational logic (social welfare, inequity aversion). In this second category, other-regarding preferences are inevitably linked to macro levels of inequality. When altruism

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[1]In this research altruism has often taken the form of a self-reported measure (the Self-Report Altruism, SRA, Scale) aggregating different items capturing an individual's engagement in altruistic behaviors (pushing a stranger's car out of the snow, giving money to a charity, etc). See, for example, the research on altruistic personality by Rushton *et al.* (1981).

[2]See, for example, Andreoni (1989, 1990).

is significant, as the allocation of material payoffs become more equitable, the utility of individuals increases (see, for example, Fehr and Gächter, 2000). While we accept that the role of altruism as an individual characteristic in determining redistribution preferences is an important one, we emphasize a situational approach in this article.[3]

Our second point of clarification is to emphasize that this article focuses on the demand for redistribution, and brackets away how (or even if) this demand is translated into policy. Much of the recent research on this topic has emphasized the supply side of redistributive politics (see, for example, Hacker and Pierson, 2011). Less attention has been paid to the demand side and, in particular, the determinants of redistributive preferences.[4] The failure to respond to growing inequality is in fact consistent with several theories of redistributive preferences, such as Alesina and Angeletos (2005) or those that emphasize racial politics. Others, such as our own, imply that the demand for redistribution rises with growing inequality. Analyzing individual preferences for redistribution is therefore essential for understanding the relative importance of supply and demand factors. It is this task that this article now turns to.

A Model of Altruistic Preferences for Redistribution

This section introduces our proposed *income-dependent altruism* model, capturing the relationship between self-interest, other-regarding concerns and preferences for redistribution. We then demonstrate the distinctiveness of our results by contrasting our model with several prominent alternatives.

Income, Redistribution, and Budgets

Let individuals be indexed by i, $i \in \{1, 2, \ldots, n_s\}$. There are S political subdivisions (e.g., states), indexed by s, $s \in \{1, 2, \ldots, S\}$. We denote the total number of individuals by N. Individuals are distinguished by their gross income level, y. Thus, the gross income of the ith individual is given by y_i,

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[3]We agree that, for many economic outcomes, personality measures are as predictive as cognitive ones (see, for example, Almlund *et al.*, 2011) but find this compatible with our main argument. It is certainly possible that there are some individuals that have more altruistic personalities than others. But, as we show in the next section, this would not affect the general implications of our argument about the relationship between redistribution preferences and macro levels of inequality.

[4]Paradoxically, this is a topic that has been the focus of more research in the economics (see, for example, Alesina and La Ferrara, 2005; Fong, 2001; Keely and Tan, 2008) than in the political science literature.

where $0 \leq y_i < y_j \leq \infty$ for $i < j$. Average income is then defined as

$$\bar{y} = \frac{1}{N} \sum_{i=1}^{N} y_i. \tag{1}$$

The government operates a linear tax, τ, $\tau \in [0, 1]$, and distributes the proceeds to all citizens in equal lump-sum transfers, T. The size of the transfer is determined by government revenue, $\tau \bar{y}$, less the costs of taxation $\phi(\tau)\bar{y}$. To keep the model as simple as possible, we assume that $\phi(\tau) = \frac{1}{2}\tau^2$. The government's budget is balanced, so

$$T = \left(\tau - \frac{1}{2}\tau^2 \right) \bar{y}. \tag{2}$$

With taxes and transfers, each agent's budget constraint, equivalent to her consumption or disposable income, is then given by:

$$c_i = (1 - \tau)y_i + T. \tag{3}$$

Preferences

Individuals have a separable utility function consisting of both their *own utility* (or self-interested utility), $u(c_i)$, which is defined over each person's disposable income c_i, and *other-regarding utility*, Ω_s, parameterized by δ:

$$V[u(c_i), \Omega_s] = (1 - \delta)u(c_i) + \delta\Omega_s. \tag{4}$$

In this setup, $\delta \in (0, 1)$ determines how much weight an individual places on individual versus social welfare: a larger δ means the person cares more about social welfare and less about individual welfare. It would be perfectly plausible to allow the parameter δ to vary across different individual *types* — altruistic versus non-altruistic — in which case we would write δ_i. However, not allowing δ to vary makes clear that our results, in particular the relationship between income and inequality, do not depend on such variation.

For the agent's own utility, we impose the following standard restrictions on u:

$$\begin{aligned} &u'(c) > 0, \\ &u''(c) < 0, \text{ and} \\ &\lim_{c \to 0} u'(c) = \infty. \end{aligned} \tag{5}$$

In addition, in certain cases it will be either convenient or necessary to adopt a specific form for these assumptions:

$$u(c) = \frac{c^{1-\epsilon}}{1 - \epsilon}, \quad \text{for } \epsilon \in (0, 1). \tag{6}$$

Note that ϵ measures the concavity of the utility function. As explained in the following section, concave utility implies aversion to inequality. Also note that our restrictions on ϵ will imply, following Iversen and Soskice (2001) and Moene and Wallerstein (2001), that the amount of redistribution preferred by an individual decreases as her income increases.

As for other-regarding preferences, we assume that they take the form of a standard social welfare function:

$$\Omega_s = \frac{1}{n_s} \sum_{i=1}^{n_s} u(c_{i,s}), \tag{7}$$

which is simply the average of all individuals' utility in a given political subdivision, s.

The model above makes clear, while redistribution takes place at a national level — as made explicit in Equations (1)–(3) — individuals exhibit concern for inequality at a subnational level — as made explicit in Equations (4) and (7). There are compelling reasons for why other-regarding motivations would be dependent on a more local level of inequality, for instance, if salience, proximity, or availability of information matters to altruism. This implies that the relevant level of macro-inequality should be one at which a visible connection to the need of the poor (and the moral benefits of generosity) could be made by individuals. We return to this issue in the empirical analysis below.

Model Results

Implications of the Model

A critical implication of the social welfare function is that it directly reflects levels of income inequality. The basis behind this identity is straightforward. It is demonstrated in a classic paper by Atkinson (1970), which constructs an index of inequality from a standard social welfare function. Assuming the specification of the utility function in Equation (6), we denote this Atkinson Index as $Q_s \in [0,1]$, with 0 implying perfect income equality (everyone has equal income) and 1 perfect inequality (one person owns all income). The index is given by:

$$Q_s(\tau; c_1, c_2, \ldots, c_{n_s}) = 1 - \frac{1}{\bar{c}_s} \left(\frac{1}{n_s} \sum_{i=1}^{n_s} c_{i,s}^{1-\epsilon} \right)^{1/(1-\epsilon)}, \quad \text{for } \epsilon \in (0,1), \tag{8}$$

where $\bar{c}_s$ denotes average (national) disposable income. The identity between the social welfare function and inequality is stated formally in the following lemma.

Lemma 1 (Social welfare and inequality)**.** *The social welfare function can be expressed in terms of both mean income, $\bar{c}_s$, and inequality, Q_s, as defined by the Atkinson Index:*

$$\Omega_s = u\left[\bar{c}_s(1 - Q_s)\right] = u(c_{e,s}), \tag{9}$$

where $\bar{c}_s(1 - Q_s)$ is the abbreviated social welfare function and $c_{e,s}$ is described as equally distributed equivalent income.

Proof. See Appendix A.

Hence, the expression $\bar{c}_s(1 - Q_s)$ captures the idea that as inequality increases social welfare decreases. Slightly more formally, a larger Q_s (higher inequality) implies a smaller $\bar{c}_s(1-Q_s)$, which is equivalent to a reduction in Ω_s (lower social welfare). As stated, the fact that the social welfare function can be expressed directly in terms of inequality shows that the social welfare function is also a measure of inequality. The lemma has two additional implications. First, it dictates the choice of the measure of inequality we use in our empirical analysis, which is the Atkinson Index. In addition, the identity with the utility of equally distributed equivalent income serves a more technical purpose, which is explained in the proof to the lemma.

Most importantly for our argument, the relationship between the social welfare function and income inequality means that, although social welfare is simply an aggregate of all individuals' utility, the social welfare function also exhibits *inequality aversion*. This is because utility functions are concave (captured by the ϵ parameter in Equation (6)). That is, individuals have diminishing marginal utility of consumption. Consequently, because the rich value an additional dollar of consumption less than the poor, transferring a dollar from the poor to the rich — that is, increasing the level of inequality — reduces social welfare. By the same token, transferring a dollar from the rich to the poor increases social welfare.[5]

Turning to the implications of our conception of altruism for individual preferences for redistribution, we advance four distinct claims. Our first and most straightforward claim is that the level of redistribution preferred by an individual is decreasing in her income, which would also be the case if individuals were purely self-interested. This is because individuals have mixed motives: while they care about inequality and social welfare, they still care about the impact that redistributive policies have on their own welfare. Accordingly, richer individuals support less redistribution than poorer individuals.

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[5]Our social welfare function assumes that individuals have identical utility functions. However, we need not enter the debate about interpersonal comparisons of utility, since the social welfare function represents *individuals' judgments* about social welfare. We also note that Charness and Rabin (2002) report laboratory evidence that individuals do think about inequality in this social welfare way.

Second, there is some income threshold above which an individual prefers no redistribution and below which an individual prefers some positive amount of redistribution. This threshold also exists in the standard, self-interested model of redistributive preferences. However, the critical difference in our model is that this threshold is strictly *above* the income threshold that would obtain with purely self-interested individuals. This result follows directly from our altruistic model of preferences. Because individuals care about the welfare of others, relatively affluent individuals are willing to support more redistribution than they would if they were merely self-interested.

Third, an increase in inequality increases an individual's demand for redistribution. This result follows from the effect of an increase in inequality on social welfare and individuals' other-regarding preferences. Because inequality decreases social welfare, it also lowers individuals' utility, via their other-regarding concerns. Thus, by increasing redistribution, individuals can reduce inequality and increase social welfare.[6]

The final claim that we make is the most important statement we derive from our model of altruistic preferences for redistribution. Even though the rich prefer less redistribution than the poor, we argue that an increase in inequality will lead to a *larger increase* in support for redistribution *from the rich* than from the poor. Although perhaps counterintuitive at first, this claim can be understood within our basic conception of altruistic preferences. As we have seen, the assumption of a concave utility function plays a crucial role in shaping inequality aversion with respect to the other-regarding portion of an individual's preferences. But it also plays an important role in individuals' own self-interested preferences for consumption over redistribution. A rich person prefers less redistribution than a poor person for self-interested reasons, but an increase in inequality increases her demand for redistribution more than a poor person's. This is because she values an additional dollar of consumption less than a poor person does. She would therefore rather spend more of that dollar on redistribution than on personal consumption. In contrast, when inequality increases, a poor person, who already favors more redistribution for self-interested reasons, values an additional dollar of consumption more and would rather spend more of that dollar on personal consumption than on alleviating inequality. Thus, at the margin, a richer individual is willing to trade more consumption for redistribution even though overall she prefers less redistribution than a poor person.

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[6]We explicitly note that the effect of inequality depends on one condition: equally distributed equivalent income at the state level needs to be lower than the mean national income. Formally, this condition is stated in Proposition 1(C) as $y_{e,s} \in [0, \bar{y}]$. State equally distributed equivalent income ($y_{e,s}$) is contained in Equation (8) (for details see, Appendix A). Indeed, if $y_{e,s}$ is high enough, national redistribution may make most citizens of the state poorer. This would reduce social welfare and could offset the altruism effect. We address the empirical relevance of this condition in Appendix I.

We also demonstrate that this final result obtains *only if* there is diminishing marginal utility of consumption. Thus, one might argue that increases in inequality do not change the preferences of the poor very much because they already favor a higher amount of redistribution. And indeed such an effect can be identified in the model. However, this effect is not sufficient by itself to explain the positive interaction between income and an increase in inequality. If utility functions are not concave, this interaction effect is zero.

These results can be summarized in the following proposition:

Proposition 1 (Income-dependent altruism)**.** *The model of altruistic preferences given by Equation (4) has the following properties:*

(A) *For $y_i \geq \hat{y}$, the level of redistribution preferred by individual i, denoted τ_i^*, is $\tau_i^* = 0$. For $y_i < \hat{y}$, the preferred level of redistribution satisfies $0 < \tau_i^* < 1$. Furthermore, we note that $\hat{y} > \bar{y}$: the income threshold for preferring some positive amount of redistribution is greater than mean income.*

(B) *An individual i's preferred level of redistribution τ_i^* is decreasing in individual income y_i. Formally, $\partial \tau_i^* / \partial y_i < 0$ for all $y_i \in [0, \hat{y}]$.*

(C) *An individual i's preferred level of redistribution τ_i^* is increasing in inequality Q_s. Formally, $\partial \tau_i^* / \partial Q_s > 0$ for all $y_{e,s} \in [0, \bar{y}]$.*

(D) *The effect of an increase of inequality Q_s on an individual i's preferred level of redistribution τ_i^* is increasing in individual income y_i. Formally, $\partial^2 \tau_i^* / (\partial Q_s \partial y_i) \geq 0$ for all $y_i \in [0, \hat{y}]$. Furthermore, this is true if and only if the utility function is strictly concave. That is, for all $\epsilon \in [0, 1)$, $\partial^2 \tau_i^* / (\partial Q_s \partial y_i) \geq 0$ if and only if $\epsilon > 0$; otherwise, $\partial^2 \tau_i^* / (\partial Q_s \partial y_i) = 0$.*

Proof. See Appendix A.

Figure 1 graphically depicts the impact of an increase in inequality on redistributive preferences.[7] With income displayed on the horizontal line and redistributive preferences on the vertical line, the two curves represent the relationship between an individual's income and her redistribution preferences at two different levels of inequality. The lower line represents a lower level of inequality (Q_s), while the upper curve corresponds with a higher level of inequality (Q_s'). Thus increases in inequality shift the income-redistribution curve upwards. As explained in the previous paragraphs, this implies that an increase in inequality increases demand for redistribution from all individuals, regardless of income. However, as theorized above, note that the distance between the two curves increases as one moves up the income scale. Thus, an increase in inequality has a smaller effect on the redistributive preferences of the poor and a larger effect for the rich.

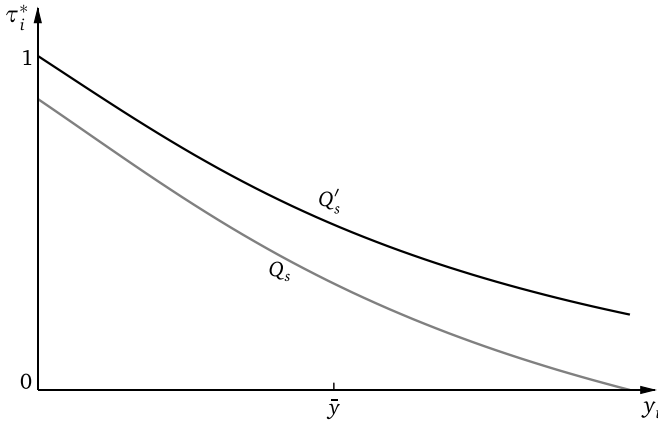[7]To plot these utility functions we set ϵ and δ to 0.5.

Figure 1: Income-dependent altruism: the effect of an increase in inequality (from Q_s to Q'_s) on redistribution preferences.

Distinguishing the Model

We are of course not the first to suggest that other-regarding concerns play a role in support for redistribution. In this section, we have two objectives. First, we distinguish the implications of our model from *other theories of other-regarding preferences.* Second, we also acknowledge that some models of preferences, including those that do not assume other-regarding concerns, *have implications that are similar to our main ones*, and discuss how we adjudicate among them.

First we consider alternative other-regarding models with distinct implications. Because our argument highlights the other-regarding consequences of economic inequality, we focus on those models with similar features.[8] The most influential ones in the political economy literature are Fehr and Schmidt's (1999) on reference-dependent inequity aversion and Alesina and Angeletos's (2005) on fairness preferences. The inequity-aversion preferences of Fehr and Schmidt have been widely cited and applied[9] and are based on extensive experimental evidence. In Fehr and Schmidt's argument, concerns about advantageous inequality (altruism) are assumed to matter less than concerns about disadvantageous inequality (envy). For Alesina and Angeletos (2005), individuals have "earned" as well as "unearned" income and only inequality

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[8]Thus, we do not directly address social distance models (e.g., Lupu and Pontusson, 2011; Shayo, 2009) which highlight the *limits* of other-regardingness, or models such as last-place aversion preferences (Kuziemko *et al.*, 2014) which make predictions about the effects of inequality on only a smaller subset of the population.

[9]For a recent application in political science, see, e.g., Lü and Scheve (2016).
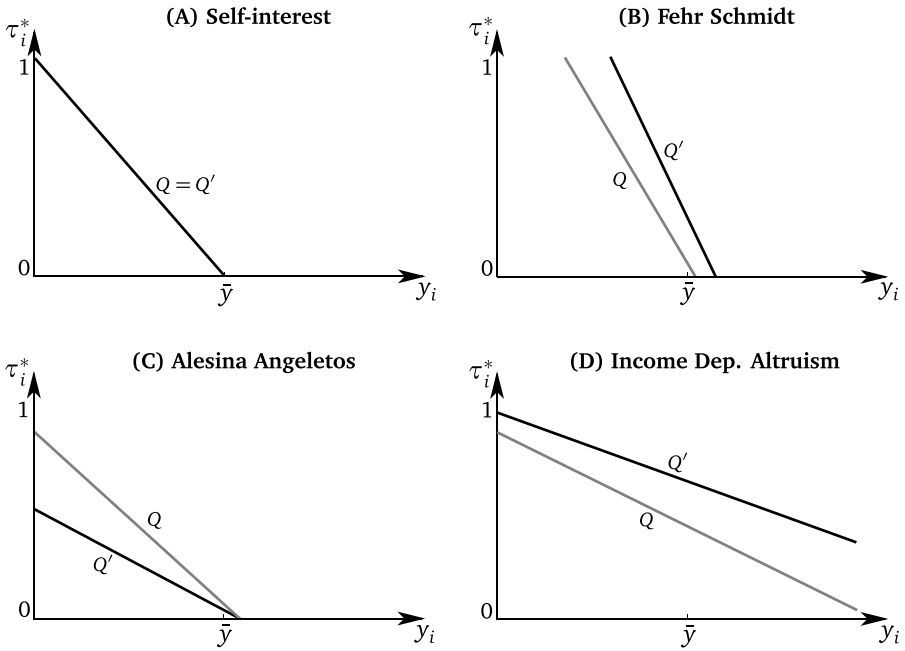
Figure 2: Implication of changes in inequality for redistribution preferences in four alternative models. Low (Q) and high (Q') inequality. Mean income is denoted by $\bar{y}$. (a) Self-interest, (b) Fehr-Schmidt, (c) Alesina-Angeletos, and (d) income-dependent altruism.

pertaining to "unearned" income is of concern. This distinction accords with the popular notion that only inequality of opportunities, rather than outcomes, deserves to be corrected. Furthermore, it has been generally received as a compelling resolution of the puzzling macro-comparative finding (the so-called Robin Hood paradox) that redistribution is higher when inequality is lower — that is, where there appears to be less need for redistribution.

Figure 2 illustrates four different models of preferences — pure self-interest (a), inequity aversion (b), fairness (c), and income-dependent altruism (d) — and the distinct patterns of income, inequality, and preferences for redistribution they imply.[10]

Getting similarities out of the way first, we can observe that in all other-regarding models (b–d) the level of redistribution preferred by an individual is decreasing in her income, just like in the classic Meltzer–Richard model. This reflects the fact that individuals have mixed motives: although agents

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[10]The predictions in Figure 2 are derived from the models. The derivations are in Appendix B.

may be other-regarding, they care for their own interests as well. Note also that in all other-regarding models, concern about inequality increases the income domain over which individuals prefer at least some positive amount of redistribution. When individuals are purely self interested, no one above the mean income prefers any level of redistribution. When individuals have other-regarding concerns, at least some with income above the mean prefer some redistribution. This is the result of other-regardingness in action: concern about others' welfare leads individuals to favor more redistribution than if they were purely self-interested.[11]

Turning now to differences, the first observation to make is the way that a mean-preserving increase in macro-inequality changes preferences for redistribution. Such a change has an effect in all of the other-regarding models, but not the self-interested one. A mean-preserving change in inequality makes no difference to self-interested persons with the same income under either distribution. For both inequity aversion (b) and income-dependent altruism (d), an increase in inequality increases the demand for redistribution for individuals of all income types. This is because both kinds of preferences exhibit inequality aversion: inequality in any form comes at a cost to other-regarding utility. In contrast, an increase in inequality *lowers* the demand for redistribution with fairness preferences (c). This is because fairness preferences are concerned only with unearned or unfair inequality, in contrast to earned or fair inequality. With fairness preferences, when inequality is high (low), differences in income are assumed to be less (more) likely the product of luck, and therefore there is less (more) of a desire to reduce actual inequality.

The second major observation is how an increase in inequality affects individuals at different points in the income scale. For inequity-aversion preferences, an increase in inequality increases the demand for redistribution, but this effect decreases as income increases. This is, as we have explained earlier, because individuals are assumed to care more about what Fehr and Schmidt call disadvantageous inequality (or envy) than about advantageous inequality (or altruism).

In summary, the predictions of income-dependent altruism are quite different from those of inequity-aversion or fairness models. Unlike fairness preferences, but like inequity aversion, an increase in inequality increases the demand for redistribution. And unlike *both* fairness and inequity-aversion preferences, the effect of an increase in inequality is larger for the rich than the poor. The theoretical interactions between income and inequality in the models of Fehr and Schmidt and Alesina and Angeletos have not, to our knowledge,

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[11]Note that in all cases mean income, $\bar{y}$, is not substantively important. Depending on parameters, this reference point could take on several possible values. The important observation to make is the difference that other-regarding concerns make to the threshold condition, $\hat{y}$, relative to self-interested preferences.

been derived in the literature. Proofs of these statements are available in Appendix B.

We now consider other models of preferences, including those that do not assume other-regarding concerns but that have similar implications to our main hypotheses. For these alternatives, we will attempt to address the causal mechanisms directly through our empirical analyses below. We outline the theoretical alternatives here and return to their implications in the robustness tests we develop in the following sections. The first alternative with similar implications is what could be termed the insurance model of social-policy preferences (e.g., Iversen and Soskice, 2001). Although not a model with other-regarding preferences, an objective function that is concave in individual income is also important in models of redistribution based on insurance. Indeed, in a recent article, Alt and Iversen (2016) argue that a model of altruism incorporating social distance and an insurance model with segmented labor markets yield substantively identical conclusions. Nevertheless, our model of income-dependent altruism retains some implications that are distinct from the social insurance model. This is mainly because in our altruism model inequality directly affects individuals' utility, but also because it does not feature a social distance parameter. Consequently, while the thrust of the model analyzed by Alt and Iversen is that increases in inequality reduce demand for redistributive social insurance when combined with segmented labor markets, our argument implies that a rise in inequality will lead individuals to favor more redistribution when controlling for population heterogeneity.[12]

Some arguments that move away from a limited conception of material self-interest as tax and transfers also have similar implications to our altruism model. In particular, if individuals are concerned about the negative externalities of inequality — such as increases in crime or political and social instability — increases in inequality may increase support for redistribution as a way to reduce these externalities. Rueda and Stegmueller (2016) further argue that longer time horizons and lower stakes (in relation to current tax and transfer considerations) mean that the negative externalities of inequality will be more important to the rich. They show that the rich in more unequal regions in Western Europe are more supportive of redistribution than the rich in more equal regions because of their concern with crime. Given the similar empirical implications, we reproduce Rueda and Stegmueller's (2016) analysis of the effects of negative externalities in our robustness tests below.

Finally, it is also possible that other-regarding concerns may vary systematically across income groups. Recently, Weinzierl (2014) has focused on identifying the extent to which individuals have redistributive preferences based on Utilitarian/Rawlsian or on Equal Sacrifice principles. If higher income

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[12]Moreover, we directly address insurance motivations in our robustness tests, by exploring the effects of the specificity or non-transferability of individual skills.

respondents were less likely to hold Equal Sacrifice distributive preferences,[13] we would observe a similar pattern presented in our main results. Alternatively, the rich may be more responsive to changes in inequality because their other-regardingness is more acute (formally, the other-regarding parameter, δ, might be larger for rich than for poorer individuals). One version of this claim is that the rich might be particularly sensitive to inequality because they are envious of the superrich. These approaches generate predictions that are similar to the income-dependent altruism model presented in this article. While data limitations make it difficult to address whether the importance of Equal Sacrifice principles is greater for the rich,[14] we can explore whether the rich envy the superrich. We show in our robustness tests that the concentration of income at the top does not affect the substantive findings in the article.

Testing the Model

Our statistical specification closely follows our theoretical model. From the first-order condition of individual i's utility function in Equation (4) we derive the theoretical function $\tau_i^*(y_i, Q_s)$, which represents i's preferred level of redistribution, τ_i^*, given i's income, y_i, and the level of inequality, Q_s. The (partial) second-order Taylor expansion of $\tau_i^*(y_i, Q_s)$ is given by:[15]

$$\tau_i^* = x + \frac{\partial \tau_i^*}{\partial y_i} y_i + \frac{\partial \tau_i^*}{\partial Q_s} Q_s + \frac{\partial^2 \tau_i^*}{\partial Q_s \partial y_i} Q_s y_i, \tag{10}$$

so that our estimated regression equation is of the form

$$R_i = b y_i + c Q_s + d Q_s y_i. \tag{11}$$

Here R_i is an individual's measured level of redistribution preference, and b, c, and d are estimated parameters representing parts (B), (C), and (D) of Proposition 1. If our estimate of b is significantly (in the statistical and substantive sense) smaller than zero, we can infer that $\partial \tau_i^*/\partial y_i < 0$ and confirm part (B) of Proposition 1; if our estimate of c is significantly larger than zero, we infer that $\partial \tau_i^*/(\partial Q_s) > 0$ confirming part (C). Finally, in testing our central hypothesis, if our estimate of d is significantly larger than zero, we show that $\partial^2 \tau_i^*/\partial y_i \partial Q_s > 0$ and confirm part (D) of Proposition 1.

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[13]Equal Sacrifice implies a rejection of horizontal inequity in taxes (conditional on income-earning ability) because a taxpayer's sacrifice is determined by his or her income-earning ability only. See Weinzierl (2014) for details.

[14]The work of Weinzierl (2014) does not seem to suggest so.

[15]We simplify by ignoring the higher order quadratic terms (which are relegated to the remainder). We also estimate the full equation (including higher order terms) using nonlinear least squares and obtain the same core result. Details are available in Appendix C.

Data

We estimate our model using a panel of repeated individual level surveys. The General Social Survey (GSS) covers more than 30 years and contains measures for individual income and preferences. It therefore has figured prominently in studies of redistribution preferences (e.g., Alesina and Angeletos, 2005; Alesina and Giuliano, 2011).

Our argument is clear in proposing that the importance of inequality emerges from its relationship to altruism. As argued in the theory section, an individual's self-interest is concerned with her relative income at the national level (since redistribution occurs primarily through national institutions) while her other-regarding motivations are affected by a more local level of inequality (given salience, proximity, or availability of information). We therefore move away from national data and use state levels of inequality matched to the GSS.[16]

A reminder: as indicated in the theory section, the hypothesized effect of inequality depends on equally distributed equivalent income at the state level being lower than mean national income. More formally, $y_{e,s} \in [0, \bar{y}]$. In Appendix I we provide some evidence to address this point directly. Figure I.1 presents values of $y_{e,s}$ calculated as differences from $\bar{y}$.[17] The figure makes clear that equally distributed equivalent income at the state level is consistently below the national mean. The exceptions where $y_{e,s} - \bar{y}$ is positive (and above the confidence interval) are Alaska and Maryland until around 1990, and Connecticut and New Jersey for a shorter period during the 1980s.[18] Since equally distributed equivalent income at the state level is not necessarily an intuitive concept, we explore this issue in two additional ways. Perhaps the easiest way of thinking about the importance of the relationship between $y_{e,s}$ and $\bar{y}$ to our theoretical argument is to consider an extreme example. Imagine a state with a high level of local inequality but in which everyone is above the national mean (and in which, therefore, despite the inequality, rich citizens would oppose redistribution because it makes all citizens of the state poorer). In this state, the affluent would have little reason to support national redistribution (no matter how altruistic). Is this empirically relevant? The

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[16]It is possible that more local levels of inequality are also relevant as determinants of the altruism effects we emphasize in the article. But, because of the lack of reliable data at sub-state levels (particularly if we want to focus on the significant temporal variation in inequality we know has occurred in the United States since the 1970s), we are unable to explore this topic in more detail. Given the dramatic increase of inequality in the United States in the period we are studying, it is also possible that altruism effects are affected by national levels of inequality. We estimate a simple empirical model in which both relative income and inequality are measured at the national level. The results are summarized in Appendix H and they confirm the article's main state-level inequality findings.

[17]See the explanation in Appendix I for details about the measurement of these parameters.

[18]These exceptions are limited and do not affect the existence of the theorized general pattern in the main results.

evidence in Figure I.1 already suggested this not to be the case. In Figure I.2 we provide the share of household incomes below the national mean in each state. This percentage is in most states and throughout the entire period well above 50% (and only around 40% in Alaska until the end of the 1990s). In other words, national redistribution always makes a significant share of the state population richer. Finally, since this issue is most problematic when we consider that not enough national redistribution may "trickle down" to the state level, we show the average dollar amount of federal transfers received by an individual in a given state in a given year in Figure I.3. These transfers are significant in all states (even those where $y_{e,s} - \bar{y}$ is positive). They are consistently above 1,000 (in constant 1999 Dollars) and increasing throughout the period we analyze.

We select surveys starting in 1978 (when our redistribution preference measure becomes available) and ending in 2010. We limit our population to working-age (20–65) individuals who are not currently in full-time education. These restrictions yield 21,704 observations. After removing individuals with missing values on covariates, we are left with 19,025 individuals.[19]

Since we present our model as an alternative to Fehr and Schmidt (1999) and Alesina and Angeletos (2005), we should address how our evidence compares to theirs. Fehr and Schmidt (1999) provide experimental evidence in one-on-one settings, not assessments about the level of redistribution in society. Their evidence is quite convincing and valuable, but, we argue, not as directly connected to the politics of redistribution as ours. Alesina and Angeletos (2005), on the other hand, first simply illustrate the correlation between the share of social spending over GDP and the percentage of respondents in the World Values Survey who think that income is determined mostly by luck, and then use the World Values Survey to regress left–right political self-identification on individual beliefs about what determines income. We argue that the GSS analysis we propose provides better and more consistent measures for the variables of interest (including redistribution preferences but also, importantly, income).

Statistical Specification

Let R_{ist} be the stated redistribution support of individual i ($i = 1, \ldots, n_{st}$) in state s ($s = 1, \ldots, S$) at time t ($t = 1, \ldots, T$). Observed survey responses are distinct from preferences. We thus use a latent variable setup, where observed responses are generated by an underlying continuous latent preference variable R_{ist}^* (e.g., Greene, 2002, p. 669). Since we are interested in the effect of changes in inequality, we opt for a specification which includes state-specific constants, ξ_s, as well as common time shocks, λ_t. Due to the nature of our repeated

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[19]Multiple imputation does not yield substantively different results. Results available from the authors.

cross-section survey data, some states have fewer observations per time-point than others. To overcome this limitation, we specify a hierarchical model for state-specific effects, yielding shrinkage estimates for preferences (Jiang, 2007; Rabe-Hesketh and Skrondal, 2008). This leads us to estimate the following hierarchical probit specification:

$$R_{ist} = \mathbf{1}(R_{ist}^* > 0), \tag{12}$$

$$R_{ist}^* = \boldsymbol{\beta}' \boldsymbol{x}_{ist} + \gamma_1 \tilde{y}_{ist} + \gamma_2 Q_{st} + \gamma_3 Q_{st} \tilde{y}_{ist} + \lambda_t + \xi_s + \epsilon_{ist}. \tag{13}$$

The effect of our variables of interest is captured by the three γ coefficients, which capture the role of income distance, $\tilde{y}_{ist}$, the direct effect of inequality in state s in year t, Q_{st}, and the effect of inequality conditional on income, $Q_{st}\tilde{y}_{ist}$.[20] Income distance $\tilde{y}_{ist}$ is given by $y_{ist} - \bar{y}_t$, the difference between the income of respondent i in state s and the national mean income in that year. This captures directly our theoretical variable of interest, a respondent's relative position in the income distribution. We include an intercept and a number of individual- and state-level controls in $\boldsymbol{x}_{ist}$, with associated effect estimates $\boldsymbol{\beta}$. Residuals ϵ are distributed normal with unit variance.[21]

As discussed earlier, our state-specific effects follow a hierarchical specification, that is, we specify them as draws from a normal distribution centered at zero with variance ψ^2 estimated from the data,

$$\xi_s \sim N(0, \psi^2), \quad s = 1, \ldots, S. \tag{14}$$

We estimate this model using restricted maximum likelihood and integrate over the random state effects distribution using adaptive Gaussian quadrature with 15 integration points (Rabe-Hesketh *et al.*, 2005).

We investigate the robustness of our model choice by estimating a specification with state fixed effects, as well as a linear probability specification with state and time fixed effects (with R_i instead of R_i^* as the dependent variable).

Dependent and Independent Variables

Preferences

We capture redistribution preferences using a commonly used measure (e.g., Alesina and Angeletos, 2005), available repeatedly in the GSS. It presents respondents with the following statement: "the government should reduce income differences between the rich and the poor, perhaps by raising the taxes

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[20]Thus, γ_1 corresponds to b in Equation (11), γ_2 to c, and γ_3 to d.

[21]We estimate a probit model since we create a binary redistribution support indicator (described below) which allows for easier presentation of results (in terms of the probability of supporting redistribution). But note that both a more complex hierarchical ordered probit model as well as a simpler linear probability model yield substantively identical results.

Table 1: Distribution of redistribution preferences (in %), 1978–2010.

Seven-point response scale							Support indicator
No						Yes	
1	2	3	4	5	6	7	
12.7	7.9	13	19.2	18.2	10.6	18.3	28.9

of wealthy families or by giving income assistance to the poor." Answers are recorded on a seven-point scale, with labeled endpoints "1=should" and "7=should not," which we reverse for ease of interpretation. Table 1 shows the distribution of responses in our sample. It is immediately apparent that preferences regarding redistribution are polarized: a relatively large number of responses are concentrated at both extremes of the scale. As many as 18% of the individuals in a survey clearly declare the government should reduce income differences, while as many as 13% vehemently declare that it should not. For our statistical model we create an indicator variable which is equal to one if a respondent indicates clear support of redistribution by choosing the highest or second highest answer category (displayed in the last column of Table 1). While the table provides a bird's eye view of Americans' redistribution preferences, we must keep in mind that these are aggregate numbers (and do not reflect the within-state and time variation to be emphasized below).

Inequality

Our model conceptualizes inequality via the Atkinson index (see Equation (8)). We directly translate this into an empirical measure, by using state-level Atkinson indexes for each year, denoted Q_{st} (Atkinson, 1970; Cowell, 2000). The basis for our calculations is tax return data from the Internal Revenue Service. This is preferable to survey-based calculations, as argued in detail by Atkinson *et al.* (2011). Not only are the very rich underrepresented in standard surveys but, in order to protect respondents' anonymity, incomes are usually top-coded. Consequently, the extent of inequality tends to be underestimated when calculated from sample surveys. Matters are improved when inequality is calculated from administrative records. We use the Atkinson index from Frank (2009) who calculates a number of inequality measures following Cowell and Mehta, 1982 based on IRS data.[22]

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[22]But note that this decision does not drive our main finding. We also calculate a different measure of inequality, the Gini index, from the equivalized household incomes in each state-year in the Current Population Survey (see Appendix G for details). Our main coefficient of interest (see Table 2) representing the income-conditional effect of a unit change in inequality is estimated as 0.208 (0.058) when using the Atkinson index, and as
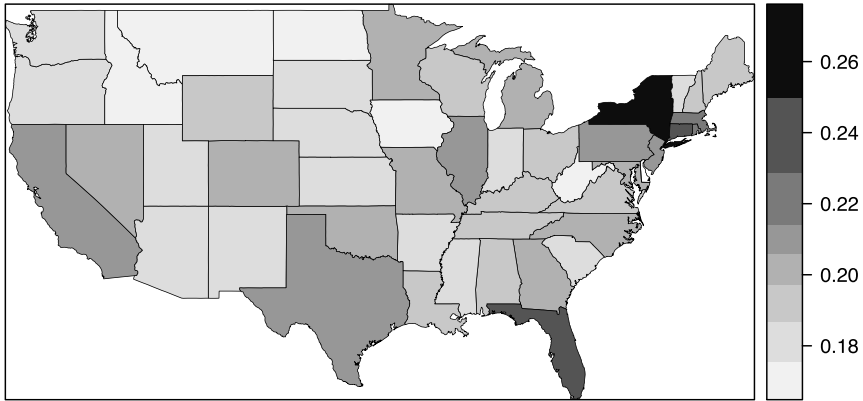
Figure 3: Map of inequality (Q_{st}) by state, 1978–2010.

Figure 3 shows average levels of inequality by state over the period in our analysis. The figure shows inequality to be the highest in New York, Massachusetts, Connecticut, Florida, Texas, and California. The most equal states are Nevada, Idaho, Indiana, West Virginia, and Washington. Since the analysis to be developed below will emphasize temporal within-state variation, Figure 4 shows the evolution of inequality in different states (and regions) in the United States from 1970 onward. The figure illustrates a secular increase in inequality from 1970 to 2010, but it also shows the degree of these increases to be quite different in specific states. In the Northeast, for example, the levels of inequality across states are quite similar in 1970. By 2010, however, the Atkinson index had increased only from 0.17 to around 0.25 in some states, while it had experienced a much more explosive increase (from 0.17 to more than 0.35) in others.

Our choice of inequality measure follows directly from our theoretical model.[23] Furthermore, the Atkinson index has a number of desirable properties (such as subgroup decomposability; e.g., Shorrocks, 1980). However, some researchers might be more familiar or comfortable with the Gini index as a measure of inequality. Therefore, we also provide results with inequality measured via the Gini coefficient, from the same source (Frank, 2009), in our robustness section.

0.297 (0.088) when using our Gini index.

[23]The sensitivity parameter ϵ of the estimated Atkinson index (which is general in our theoretical model) is set to 0.5 in Frank (2009).
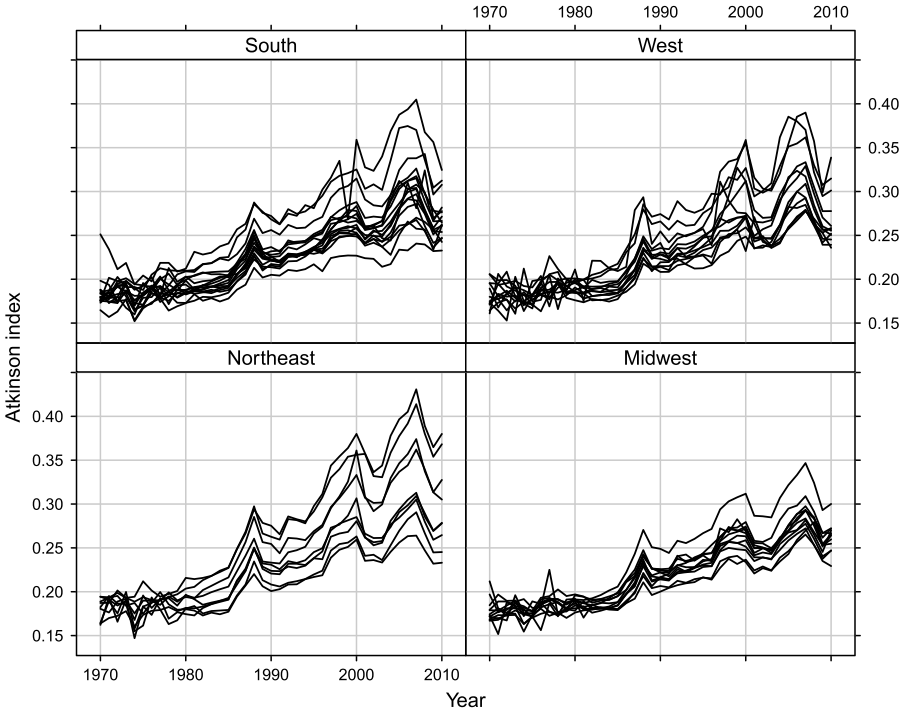
Figure 4: Evolution of inequality, Q_{st}, 1970–2010.

Income distance

We measure income distance as the distance between a respondent's household income and average national income in the year of the survey.[24] The GSS captures income by asking respondents to place their total net household income into a number of income bands. Following standard practice in the American Politics literature, we transform income bands into midpoints (see e.g., Hout, 2004). The top-coded income category value is imputed by assuming that the upper tail of the income distribution follows a Pareto distribution (e.g., Kopczuk *et al.*, 2010). Finally, to allow meaningful comparison over time, incomes are converted to constant dollars (with base year 2000).

Controls

To control for state-specific changes in economic conditions, we use yearly state-level unemployment rates. We calculate them by averaging the LA series from

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[24]This follows directly from our theoretical argument but represents a simple centering, which leaves the *distribution* of incomes unchanged.

the Bureau of Labor Statistics for state monthly unemployment rates (Bureau of Labor Statistics, 1992). As further individual-level controls we include a respondent's age, gender, education (years of schooling), an African-American indicator variable, and a "non-white" summary indicator. Respondents' labor market status is captured by indicator variables for currently being self-employed, unemployed, or in part-time employment. Finally we include an indicator for respondents living in urban areas. Descriptive statistics for these variables are given in Table D.1 in the appendix.

Results

Table 2 shows parameter estimates and standard errors for Equation (13) under various model specifications.[25] Columns (1) and (2) display results from our hierarchical model, without and with control variables, respectively. In both we find that increasing income distance above the national mean is inversely related to support for redistribution. The direct effect of inequality on preferences is considerably reduced when we include a range of individual- and state-level control variables. In fact, there is no statistically reliable main effect of inequality in specification (2). While failing to confirm part C of Proposition 1, this underscores our central theoretical argument, namely (as stated in part D of Proposition 1) that the effect of inequality is conditional on income.[26] In terms of model coefficients this expectation is tested by the income–inequality interaction. Confirming our expectations, we find a positive effect, indicating that inequality matters more for the rich. The parameter estimate of this interaction is significant (in the statistical sense; we evaluate its substantive importance below).

   Our empirical strategy exploits within-state changes in inequality. To make this more explicit, we estimate a fixed-effects version of our model in specification (3).[27] Our results are remarkably similar. They again emphasize the fact that the effect of changing inequality is conditional on respondents'

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[25]Appendix E shows an extended version of this table where we additionally include bootstrapped standard errors. Our results are not affected by this choice.

[26]Regarding the direct effect of inequality, we would distinguish here between the deterministic nature of our theoretical model and our empirical model (where uncertainty affects the estimation). As illustrated by Figure 1, the difference between the preferences of individuals in high and low inequality places are closer for the poor and more distant as individual income increases. Empirically, these effects are estimated with uncertainty and (depending of the share of poor and rich individuals in the sample) this may affect the lack of evidence in support of the direct effect of inequality argued in part C of Proposition 1.

[27]This is an unconditional fixed-effects model, since there is no way to integrate state-specific constants out of the likelihood. It is well known that unconditional (or dummy variable) fixed-effects estimators for probit models are biased (Greene, 2004) due to the incidental parameters problem (Neyman and Scott, 1948). However, since our number of cases per state is reasonably large, we expect this not to be of major concern (see Katz, 2001).

Table 2: Income, inequality, and redistribution preferences. Estimates and standard errors.

	(1)	(2)	(3)	(4)
Income	−0.126	−0.105	−0.106	−0.189
	(0.016)	(0.016)	(0.016)	(0.020)
Inequality	1.402	0.696	0.994	2.195
	(0.531)	(0.501)	(0.838)	(1.140)
Income×inequality	0.209	0.208	0.210	0.379
	(0.058)	(0.058)	(0.059)	(0.075)
Controls	No	Yes	Yes	Yes
Deviance	22172	21718	21640	—
BIC	22409	22063	22448	—
N	19025	19025	19025	19025

Specifications: (1), (2) Random effects, maximum likelihood estimates; (3) Fixed effects, maximum likelihood estimates; (4) Fixed effects, linear probability model.

income distance. Finally, in specification (4) we employ a fixed-effects linear probability model, which uses all seven categories of the dependent variable instead of our support indicator variable. This specification, too, produces clear evidence for the conditional effect of inequality on preferences.

A stricter statistical test for our theoretical argument is provided by computing the marginal effect of a change in inequality conditional on income. Let $ME(Q|Y, X)$ denote the marginal effect of inequality, Q, conditional on income, Y, and controls X. When calculating marginal effects, it is common to set control variables to their sample mean, producing marginal effects for a hypothetical "typical" individual, $ME(Q|Y = y, X = \bar{x})$. We opt for a clearer definition based on counterfactuals.[28] What we are interested in are effects of changes in inequality (conditional on income) holding *all else equal*. Consequently, we calculate marginal effects for each case changing only inequality and income and keeping all other variables at values observed for that case: $ME_i(Q|Y = y, X = x_i)$. Average marginal effects are then simple averages over the marginal effects for each case, $AME(Q|Y, X) = N^{-1} \sum_{i=1}^{N} M_i$.

Panel (A) of Table 3 shows average marginal (unconditional) effects of inequality and income distance on the likelihood to support redistribution. These direct effects illustrate what we learned from Table 2. A marginal increase in income leads to lower average support for redistribution, ceteris

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[28]Hanmer and Kalkan (2013) provide a detailed discussion of the advantages of this strategy. See also Train (2009).

Table 3: Marginal effects.

(A) Marginal main effects		
Income	$\mathrm{AME}(Y\|X)$	$-0.017\ (0.001)$
Inequality	$\mathrm{AME}(Q\|X)$	$0.196\ (0.163)$
(B) Marginal conditional inequality effect		
Poor	$\mathrm{AME}(Q\|Y=y_P,X)$	$-0.027\ (0.199)$
Rich	$\mathrm{AME}(Q\|Y=y_R,X)$	$0.489\ (0.157)$
Difference test	$p=0.002$	

Note: Average marginal effects, based on specification (2). Difference test is distributed χ^2 with 1df. y_P refers to the 10th percentile of the income distribution, y_R refers to the 90th percentile.

paribus. The main effect of inequality is not statistically distinguishable from zero (although, again, see Footnote 26).

Panel (B) of Table 3 shows average marginal effects of inequality conditional on income. More precisely, we calculate the effect of a marginal change in inequality among the rich (those at the 90th percentile of the income distribution, around 58,000 dollars above the mean in constant dollars) and the poor (those at the 10th, around 38,000 dollars below the mean in constant dollars). We argued that an upward shift in inequality will mainly affect the rich, making them more supportive of redistribution. We find that a marginal change in inequality has little effect on the redistribution preferences of the poor, but has a marked and statistically significant effect for the rich. As expected, we find that rising inequality increases support for redistribution among the rich. Before we present the substantive magnitude of this effect using predicted probabilities below, we calculate the difference in marginal effects between rich and poor, that is, $\mathrm{AME}(Q|Y=y_R,X) - \mathrm{AME}(Q|Y=y_P,X)$. In other words, we test if the differential effect of a marginal change for rich and poor is statistically significant.[29] We calculate a χ^2 difference test, which shows that inequality does indeed affect the rich differently in a (statistically) significant way.

To illustrate the substantive role of inequality in perhaps a more intuitive way, Figure 5 shows the average predicted probability of redistribution support.[30] In this figure, the only factors that change in the comparison of predicted probabilities are income distance to the mean (on the x-axis) and the two levels of macro-inequality (the solid and dashed lines). High inequality refers to Atkinson index values at the 90th percentile of the state-level distri-

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[29] The fact that we find a significant effect in one group, and a non-significant effect in the other, does not itself show that the difference is significant (cf. Gelman and Stern, 2006).

[30] Average predicted probabilities are calculated in a similar way to the average marginal effects described earlier. And they are, once again, based on specification (2) in Table 2.
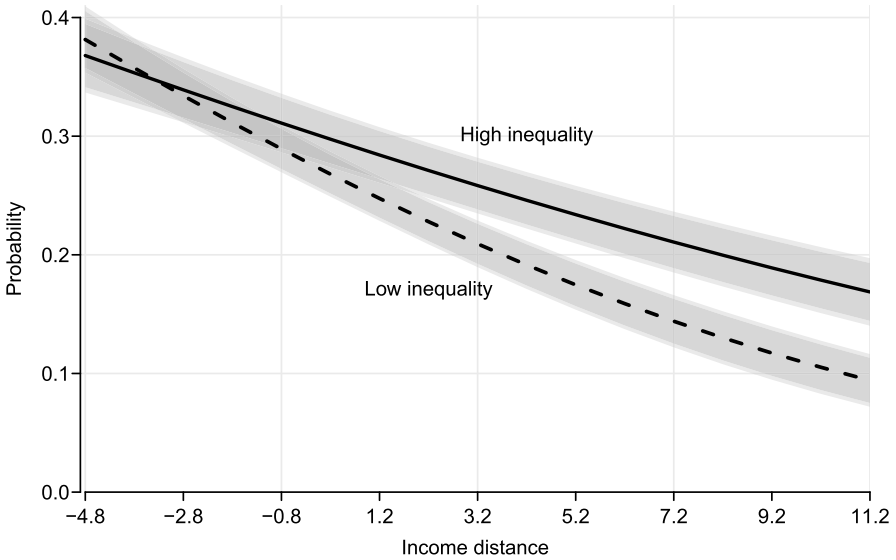
Figure 5: Average predicted probability of redistribution support as function of income distance in high and low inequality regions.

bution (similar to that of Nevada and Florida in 2007), while low inequality refers to the 10th (as in Washington or Vermont in 1985). The results provide a clear picture of the correspondence between our theoretical argument (in Figure 2) and the empirical findings. While the poor are similarly likely to support redistribution in equal and unequal states, the rich are more likely to support redistribution in states characterized by high levels of inequality.

An alternative way to illustrate the effects found in Table 2 is offered in Figure 6. In this figure, levels of macro-inequality are now on the x-axis and the two distances to the mean are now represented by the solid (the rich, 90th percentile) and dashed (the poor, 10th percentile) lines. The predicted probabilities in this figure re-emphasize the main message in the paragraph above. For the poor, the level of macro-inequality does not make much of a difference (within the confidence bounds, it is possible that their support for redistribution is higher when macro-inequality is high). Their likelihood to support redistribution fluctuates around a level close to 0.35. For the rich, on the other hand, the probability of supporting redistribution increases significantly as inequality grows from below 0.20 when inequality is at its lowest, to almost 0.30 when it is at its highest.
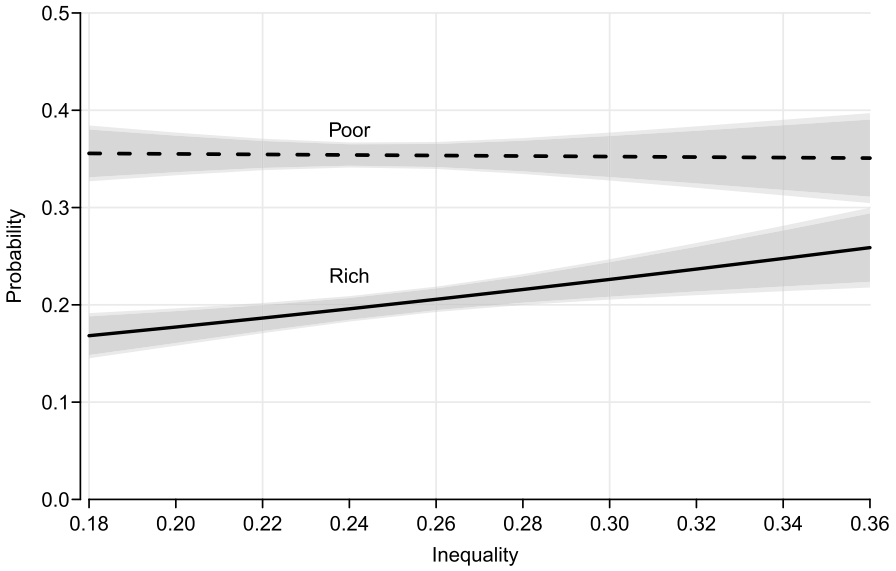
Figure 6: Average predicted probability of redistribution support as function of inequality among rich and poor.

Robustness Checks

We conduct a number of robustness checks in order to investigate the sensitivity of our results to alternative theoretical arguments. Below we summarize results from 14 specifications. In each we estimate the full model, but only present parameter estimates for $\gamma_3 Q_{st} y_{ist}$, the income–inequality interaction, to save space.

Urban–Rural Divide

We start by addressing the objection that our results might be driven by those living in high-density urban areas (see, for example, Cho *et al.*, 2006), especially in the costal regions. As argued by Rodden (2010, p. 322), individuals may sort themselves into neighborhoods with similar demographic, occupational, income, and ultimately political preferences. We address this concern in several ways. Our main model specifications all include an individual-level survey variable which indicates if the respondent lives in an urban region (defined as cities with at least 50,000 inhabitants).

Table 4: Robustness checks. Parameter estimates for income-inequality interaction.

Specification		$\gamma_3 Q_{st} y_{ist}$
Urban–rural divide		
(1)	Urban population	0.206 (0.058)
(2)	Income in metro areas	0.233 (0.061)
Ideology		
(3)	State share of liberals	0.203 (0.058)
(4)	State citizen ideology	0.217 (0.059)
(5)	Individual ideology	0.181 (0.061)
Insurance motives		
(6)	Skill specificity	0.209 (0.059)
(7)	Occupational unempl.	0.174 (0.066)
Further individual confounders		
(8)	Industry effects	0.208 (0.059)
(9)	Social class	0.203 (0.059)
(10)	Religion	0.203 (0.065)
Further state confounders		
(11)	Nonwhite pop. share	0.208 (0.058)
(12a)	Negative externalities: fear	0.207 (0.059)
(12b)	Negative externalities: state crime	0.202 (0.058)
(13)	State income	0.209 (0.058)
(14)	Federal transfers	0.208 (0.058)

Note: Based on model specification (2). Sample size is 19,205 except for: (2) 18,105; (5) 17,969; (6) 18,849; (7) 16,501; (8) 18,858; (9) 18,849, (10) 15,796.

In Table 4, we show results from two additional robustness checks. First, in Specification 1 we account for the (changing) level of urbanization by including the share of households in metropolitan areas for each state in each year. We calculate this variable from Current Population Survey (CPS) data based on codes of the location of each household provided by the Census Bureau. Second, in Specification 2 we account for the fact that some states have a high concentration of high income earners living in metropolitan areas. Thus, we include the average income of households living in a major city in metropolitan areas by state and year. Data on household location and income are from CPS. Household income is the sum of several income components of each household member adjusted for top-coding (for details see Appendix G). Our results show that, as expected, both variables strongly influence preferences. However, accounting for their influence does little to alter our main results, the income-conditional effect of inequality. In fact, adjusting for rising incomes in

high-income metropolitan areas slightly strengthens our finding of an income-dependent effect of inequality.

Ideology

Another possible concern is the omission of ideology from our analysis. In our main model we do not include an individual's ideology, since we conceptualize redistribution preferences as an intrinsic part of ideological positions (making ideology something to be explained rather than an explanatory covariate). However, this issue might have less to do with *individual* ideology, but rather with a changing general ideological predisposition of a state's citizens (harking back to the sorting argument mentioned in the paragraph above). In other words, when accounting for the fact that citizens of some states (say on the coasts) become increasingly liberal over time, we might see our findings based on changing inequality disappear.

In order to address this issue we use two different measures of state-level ideology. Our first one is the share of individuals in each state in each year classified as liberal. The data are computed by Pacheco (2011) based on NYT/CBS poll responses using a dynamic variant of a multilevel post-stratification model (see, e.g., Lax and Phillips, 2009 for a recent exposition). Our second measure uses an indirect strategy to capture *citizen ideology* (or policy mood) on a liberal-conservative continuum. Following the strategy pioneered by Rabinowitz *et al.* (1984), Berry *et al.* (1998) calculate citizens' ideology using interest group ratings of the ideological position of each state's member of congress and their challenger in each district. These district ratings are then averaged for each state and year. See Berry *et al.* (2010) for an extended discussion of the reliability of their measure.

We include these variants in Specifications 3 and 4. We find that after accounting for state ideology (which affects preferences as expected), we still replicate our core finding of an income dependent impact of inequality on redistribution preferences. Furthermore, in Specification 5 we also show that our results hold even when including individual-level ideology (we use the standard 7-point liberal–conservative measure from the GSS).

Insurance

As discussed in the theory section, one prominent account of redistribution preferences is based on the idea of insurance motives. Forward-looking individuals possess information about their risk of becoming unemployed and the likely costs of finding a new job. These costs are a function of the specificity or non-transferability of their skills. Individuals in occupations with higher risk of unemployment and/or more specific skills thus have an incentive to use the welfare state as a provider of insurance (e.g., Cusack *et al.*, 2006; Iversen

and Soskice, 2001). From this perspective, observing individuals who prefer higher levels of redistribution does not necessarily reflect altruism — they might simply want to insure their future selves against the vagaries of the labor market.

Insurance motives are compatible with our argument, which is not about *levels* of redistribution preferences, but *differences* in preferences between high and low inequality areas. We expect insurance factors to be orthogonal to our findings and explore insurance motives using two measures. Risk is captured by a variable which estimates unemployment rates by occupations, following Rehm (2011). The specificity or non-transferability of skills is captured by an encompassing measure of general and specific skills proposed by Fleckenstein *et al.* (2011).[31] When we add these variables to our model in Specifications 6 and 7 in Table 4, we find that our core result is indeed unchanged.

Further Individual-level Confounders

Our results are also robust when accounting for sector specific preferences by including a set of industry fixed effects in Specification 8.[32] Specification (6) uses the Gini inequality measure calculated from the Current Population Survey instead of IRS tax returns. Our main result is confirmed. For reasons of parsimony we exclude a number of social factors such as religion and social class from our main model. While clearly important, we argue that these factors are orthogonal to the income-inequality nexus. Specifications 9 and 10 in Table 4 show that including a five-category social class measure as well as religiosity (church attendance) in the model leaves our results unchanged.[33]

Further State-level Confounders

Moving back to the state level, we finally account for several time-changing state-level characteristics, which are not captured by our state fixed- or random-effects. A state's racial heterogeneity (as opposed to a respondent's race, which we include in our main model) might negatively affect individuals' preferred levels of spending (see, for example, Alesina and Glaeser, 2004; Luttmer, 2001). We thus include a measure of racial heterogeneity in Specification 11: the state-level share of non-white population, calculated from the CPS. We find our results to be robust.

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[31]Note that using Iversen and Soskice's measure of specificity (at the 1d ISCO level) produces the same substantive robustness result.

[32]We use the US Census Bureau's industry classification at the 1-digit level.

[33]We employ a five-category version of the Erikson–Goldthorpe class scheme: service class I, service class II, routine non-manual occupations, skilled workers, and unskilled workers. Those who are self-employed are already included in our main model via an indicator variable.

As we mentioned in our theory section, arguments concerned about the negative externalities of inequality have similar implications to our altruism model. Rueda and Stegmueller (2016), in particular, argue that longer time horizons and lower stakes (in relation to current tax and transfer considerations) mean that the negative externalities of inequality will be more important to the rich. Given the similar empirical implications, we conduct a robustness test where we include the key variable of Rueda and Stegmueller's analysis: an individual's fear of crime (as a micro-level manifestation of the externalities of inequality). In Specification 12a we show that its inclusion does not appreciably alter our results.[34] In Specification 12b we explore the effect of negative externalities measured at the macro level and use data from the Federal Bureau of Investigation's Uniform Crime Reporting database on total regional crime rates. We find our core result unchanged.

We also account for the fact that average income rose at different rates in each state.[35] We include the median household income of each state-year calculated from CPS data (adjusted for top-coding) in Specification 13. We find that this adjustment does not impact the income-conditional effect of inequality.

Finally, we account for the time-varying extent of direct federal transfers to individuals in a state. We calculate federal welfare-related transfers per person in constant dollars from the Bureau of Economic Analysis' State Personal Income accounts (see Appendix I for details). Our results are not very sensitive to this extension.

Envy Among the Affluent?

Yet another possible explanation for our findings is that the affluent (i.e., the rich) are simply envious of the wealthy (i.e., the superrich) and favor more redistribution to remedy a growing concentration of income among the highest earners. Unlike our approach, this hypothesis requires making an assumption that the rich are more other-regarding than the poor, that is, that δ varies across income, and is larger for more affluent individuals. Alternatively, the rich may have better information about the concentration of income among the very rich than do the poor.

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[34]As in Rueda and Stegmueller, we capture fear of crime by a survey item asking respondents if they are afraid of walking alone in the dark in their neighborhood. The GSS includes this item, but it is not asked for subsets of individuals. Since the resulting missing values are the result of survey design and not individual choices (such as a "don't know" response), we use 10-fold multiple imputation and draw values for missing responses from the posterior predictive distribution of a logit model (Gelman *et al.*, 2013, p. 450). Standard errors of our robustness test are multiple-imputation adjusted. Note that our results are still robust when using the (much smaller) non-imputed GSS sample.

[35]For example, between 1990 and 2000 average income increased from 17,652 to 20,107 (constant) dollars in Mississipi, but from 25,679 to 26,900 in Rhode Island.

We test these arguments with an alternative measure of inequality. In place of the Atkinson Index, we use the share of income held by the top 1% of income earners, calculated from IRS tax returns following the methodology in Piketty and Saez (2003). This income-share measure better captures the concentration of income at the top than does the Atkinson Index, which tends to weight income changes at the bottom of the distribution more heavily. Our expectation is that if our results are driven primarily by the rich being envious of the superrich, their preferences should be more responsive to income concentration at the top than to overall inequality.

The results of this alternative analysis, however, support our social welfare model rather than the envious rich argument. As we show in Appendix F, the effect of the interaction between income and the top 1% income share is reduced by 38% when compared to the one with the Atkinson Index. This substantially weaker effect suggests that envy toward the superrich is not a better explanation for the support of redistribution of the affluent in high-inequality states.

Conclusion

It is perhaps most meaningful to conclude this article by first reminding the reader about our main findings and, more importantly, referring to the alternatives we find no evidence for. Our results strongly support the existence of income-dependent altruism. The rich in more unequal places do support redistribution more than the rich in more equal places (while the poor's support for redistribution is much less affected by macro-inequality). This article's analyses provide limited support for alternative approaches to other-regarding preferences. Neither the reference-dependent inequity aversion preferences proposed by Fehr and Schmidt (1999) nor the fairness preferences in Alesina and Angeletos (2005) seem to apply to the demand for redistribution in the United States.

In the previous pages, we de-emphasized arguments about empathy and beliefs in a just world, but our analyses also introduce a degree of doubt about their relevance. In a significant contribution to the literature on redistribution, Lupu and Pontusson (2011) propose that macro-levels of equality are related to empathy. They argue that, because of social affinity, individuals will be inclined to have more similar redistribution preferences to those who are closer to them in terms of income distance. While Lupu and Pontusson emphasize skew (rather than Atkinson or Gini indices) and the position of the middle class, their argument implies that social affinity would make the rich have higher levels of support for redistribution as inequality decreases and they become closer to the middle class and the poor (the opposite of the predictions in this article). A similar relationship would be expected by the approach

that relates beliefs in a just world to redistribution preferences. To the extent that macro-levels of inequality are related to these beliefs (for example that inequality rewards the hard-working and punishes the lazy), we would observe lower levels of support for redistribution from the rich in states with higher inequality and a higher normative tolerance for it (Alesina and Glaeser, 2004; Benabou and Tirole, 2006). Our evidence fails to support these arguments.

Our research, finally, runs counter to a set of findings in the psychology literature about the influence of income on charitable giving and pro-social behavior. Using surveys conducted in the United States, some authors find that lower income individuals give proportionally more to charitable causes than higher income ones (see e.g., James and Sharpe, 2007).[36] These findings, however, are contested by research showing that the share of households giving to charity increases in income in both the United States (Andreoni, 2006) and Great Britain (Pharoah and Tanner, 1997). Other authors using experimental data find that subjective perceptions of one's social class rank in society promote generosity and charitable donations (see Piff *et al.*, 2010). This article does not address the side of altruism that concerns voluntary donations.[37] But our results do indicate that, irrespective of charity, the rich are more likely to support government-based redistribution when inequality is high.

We will conclude by noting that, in some ways, our findings tend to lie uncomfortably with the conventional wisdom on the US political economy (see, for example, Gilens and Page, 2014). Given the massive increase in national levels of inequality, a critical viewer may observe that we ought to see a similar increase in support for redistribution and, perhaps more importantly, that this increase in support for redistribution among the wealthy should result in a policy response which is hard to elucidate. Regarding the first point, our first response is to re-emphasize that even in a simple empirical model in which inequality is measured at the national level, it is in fact the case that *the rich* become more supportive of redistribution as inequality increases. The relationship is of course even stronger when looking at state levels of inequality (as we do in our main results). To the extent that these findings question the conventional wisdom on the US political economy, we think that this is a positive development and one that should be the subject of further research.

Regarding the second point, it is easier to attempt to reconcile our findings with the broader American politics literature. As McCarty and Pontusson (2009) note, models of the political economy of redistribution involve two separate propositions: there is a demand side, concerning the redistribution preferences of voters, and a supply side, concerning the aggregation of these

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[36]This research has found wide resonance in the popular press. See Greve (2009) or Johnston (2005).

[37]The relationship between income and charity giving in OECD countries is a complicated one and not always a good illustration of altruism, as the tax benefits of giving (often increasing with income) are difficult to assess.

preferences and the provision of policy. In this article we have focused on the first proposition and ignored the second. We have done this with full knowledge that a number of political and economic institutional variables (having to do with the nature of parties, electoral rules, the nature of government, etc.) may impede the translation of the demand for redistribution we have documented into supply. The question of why preferences are seemingly not translated into clear policy responses is beyond this article. However, in related work, Rueda and Stegmueller (2015) provide corroborating evidence for the importance of our demand side argument. They show that in the United States, redistribution preferences are a significant determinant of voting. More concretely, they demonstrate that income distance matters to voting mainly through its effect on redistribution preferences. Preferences alone explain half of the total effect of income on vote choice. Thus, more research on the supply side of redistribution is clearly needed, and the political relevance of this article's findings should not be ignored.

A   Proofs

A.1   Proof of Lemma 1

We show that $\Omega_s = u[\bar{c}_s(1 - Q_s)] = u(c_{e,s})$, where

$$\bar{c}_s(1 - Q_s) \tag{A.1}$$

is the abbreviated social welfare function. This equivalence, well known in the welfare economics literature, is reproduced here for the convenience of the reader. For further discussion, see Atkinson (1970) and Lambert (1989, pp. 109–136).

To begin, let $c_{e,s} = (1 - \tau)y_{e,s} + T$ be the level of disposable income that represents the average utility given by the social welfare function, or

$$\frac{1}{n_s} \sum_{i=1}^{n_s} u(c_{i,s}) = \frac{1}{n_s} n_s u(c_{e,s}) = u(c_{e,s}). \tag{A.2}$$

By Jensen's inequality, we know that $c_{e,s} \in (0, \bar{c}_s)$ and therefore that $y_{e,s} \in (0, \bar{y})$ (provided, in our case, that local and national populations are identical). In fact, Atkinson (1970) characterizes this level of income as "equally distributed equivalent income," and it is the basic building block of the Atkinson Index. It represents the level of income that if held by every individual would give that society the same level of welfare as would obtain with any given allocation of unequally distributed incomes. The Atkinson Index is constructed as:

$$Q_s = 1 - \frac{c_{e,s}}{\bar{c}_s}. \tag{A.3}$$

Since $c_{e,s}$ is strictly below mean income, this expression is always positive and always between 0 and 1. Indeed, as inequality increases, social welfare decreases as does $c_{e,s}$. This will be a useful property for subsequent proofs.

Next, using the specific utility function in Equation (6), we can rewrite equation (A.2) as:

$$\frac{c_{e,s}^{1-\epsilon}}{1-\epsilon} = \frac{1}{n_s} \sum_{i=1}^{n_s} \frac{c_{i,s}^{1-\epsilon}}{1-\epsilon}. \tag{A.4}$$

Rearranging this equation in terms of $c_{e,s}$, we obtain:

$$c_{e,s} = \left(\frac{1}{n_s} \sum_{i=1}^{n_s} c_{i,s}^{1-\epsilon} \right)^{1/(1-\epsilon)}. \tag{A.5}$$

Then, substituting this expression into the preliminary Atkinson index in Equation (A.3), we obtain:

$$Q_s = 1 - \frac{1}{\bar{c}_s} \left(\frac{1}{n_s} \sum_{i=1}^{n_s} c_{i,s}^{1-\epsilon} \right)^{1/(1-\epsilon)}, \tag{A.6}$$

which is equivalent to the expression given in Equation (8).

Finally, to recover the social welfare function, substitute the Atkinson Index in (A.6) into the abbreviated social welfare function (A.1) and then substitute the result into the utility-function specification in Equation (6). The result is Ω_s. Hence, we have $\Omega_s = u[\bar{c}_s(1 - Q_s)] = u(c_{e,s})$. $\square$

A.2   Proof of Proposition 1

First, we prove part (A). The individual's problem is to choose the tax rate that maximizes her social utility function, given by Equation (4):

$$\max_{\tau \in [0,1]} V = (1 - \delta)u(c_i) + \delta u(c_{e,s}) \tag{A.7}$$

subject to the government budget constraint in Equation (2) and the individual's own budget constraint in Equation (3). The first-order condition for this problem gives the preferred level of redistribution for each individual i, which we will term τ_i^*:

$$(1 - \delta)u'(c_i)\left[(1 - \tau_i^*)\bar{y} - y_i\right] + \delta u'(c_{e,s})\left[(1 - \tau_i^*)\bar{y} - y_{e,s}\right] = 0. \tag{A.8}$$

The second-order condition is given by:

$$\frac{\partial^2 V}{\partial \tau^2} \equiv \sigma(\tau_i^*, y_i, y_{e,s}) = (1 - \delta)\{u''(c_i)[(1 - \tau)\bar{y} - y_i]^2 - u'(c_i)\bar{y}\}$$

$$+ \delta\{u''(c_{e,s})[(1 - \tau)\bar{y} - y_{e,s}]^2 - u'(c_{e,s})\bar{y}\} < 0, \tag{A.9}$$

which is unambiguously negative.

Next, we show that $\tau_i^* \in [0, 1)$. We reformulate the first-order condition in Equation (A.8), writing the differences $(1 - \tau_i^*)\bar{y} - y_i$ and $(1 - \tau_i^*)\bar{y} - y_{e,s}$ in terms of ratios as:

$$\tau_i^* = \left(1 - \frac{y_i}{\bar{y}}\right) + \frac{\delta}{1 - \delta} \left(\frac{c_i}{c_{e,s}}\right)^{\epsilon} \left[(1 - \tau_i^*) - \frac{y_{e,s}}{\bar{y}}\right]. \tag{A.10}$$

Expressing the first-order condition in terms or ratios rather than differences constitutes no substantive change for our following results; it is simply done for analytical convenience. If $\delta = 0$, that is, if individuals are not altruistic, then individual i's optimal choice of redistribution is $\tau_i^* = 1 - y_i/\bar{y}$, which is a familiar result for self-interested preferences. In this case, preferences for redistribution are clearly decreasing in income, with τ_i^* going from 1 to 0 as income goes from 0 to $\bar{y}$. Compare this to altruistic individuals, $\delta > 0$. Setting $\tau = 0$, Equation (A.10) can be rewritten as:

$$\frac{\delta}{1 - \delta} \left(\frac{y_i}{y_{e,s}}\right)^{\epsilon} = -\frac{(\bar{y} - y_i)}{(\bar{y} - y_{e,s})}. \tag{A.11}$$

Since the left-hand side is positive, this condition requires $y_i > \bar{y}$. Define the value of y_i that satisfies this equation as $\hat{y}$. Hence, $\hat{y} > \bar{y}$, as claimed. Notice also that $\hat{y}$ is potentially quite large, especially as inequality increases: $y_{e,s} \to 0$. Finally, the maximum level of redistribution preferred by any individual is always less than one. Setting $\tau = 1$ in Equation (A.10), we get

$$\frac{\delta}{1 - \delta} = -\left(\frac{y_i}{y_{e,s}}\right), \tag{A.12}$$

which is never satisfied.

Further exploration of Equation (A.10) provides some additional important insights. First, let τ_e^* be the level of redistribution that maximizes social welfare, $\Omega_s = u(c_{e,s})$. The value of τ_e^* is such that the first-order condition for maximizing social welfare equals zero, which is $(1 - \tau_e^*) = y_{e,s}/\bar{y}$. Evaluated at τ_e^*, the second expression on the right-hand side of Equation (A.10) becomes zero, so Equation (A.10) becomes $\tau_e^* = 1 - y_i/\bar{y}$. Clearly, the level of individual income that satisfies this expression is $y_{e,s}$. Hence, an individual with income $y_i = y_{e,s}$ prefers the level of redistribution that maximizes social welfare. Furthermore, along with part (B) below, this also implies that for $y_i > y_{e,s}$, we have $\tau_i^* < \tau_e^*$ and thus $(1 - \tau_i^*) - y_{e,s}/\bar{y} > 0$. That is, for $y_i > y_{e,s}$, an individual prefers a level of taxes and transfers such that the marginal benefit of reducing inequality exceeds its cost. In other words, individuals with income above the equally distributed equivalent prefer less redistribution than social welfare demands, and hence social welfare is positive and increasing at this level of redistribution.

However, this also means that for $y_i > y_{e,s}$, an individual prefers more redistribution than if she were purely self-interested. To see this, evaluate Equation (A.10) for a self-interested individual (i.e., $\delta = 0$) with income $y_i > y_{e,s}$. This implies that $(1 - \tau_i^*) - y_i/\bar{y} = 0$. Compared to an altruistic individual ($\delta > 0$), this makes the second term on the right-hand side of (A.10) positive, because social welfare is increasing for $\tau_i^* < \tau_e^*$, which implies that $\tau_i^*(y_i > y_{e,s}, \delta > 0) > \tau_i^*(y_i > y_{e,s}, \delta = 0)$. Because this is true, this also implies that for an altruistic individual we have $(1 - \tau_i^*) - y_i/\bar{y} < 0$. That is, the marginal benefit of redistribution to an individual's material self-interest is lower than its cost. In other words, relatively well-off individuals sacrifice some material self-interest in order to satisfy their altruistic preferences for reducing inequality. An analogous argument holds for $y_i < y_{e,s}$. However, these cases require choosing more redistribution than social welfare requires, $(1 - \tau_i^*) - y_{e,s}/\bar{y} < 0$. Further, this means that the second term on the right-hand side of Equation (A.10) is now *negative*, which implies that an individual with $y_i < y_{e,s}$ prefers *less* redistribution than self-interest demands: $(1 - \tau_i^*) - y_i/\bar{y} > 0$.

To summarize, individuals with income below the equally distributed equivalent ($y_i < y_{e,s}$) want less redistribution than they would if they were purely self-interested, but more redistribution than is socially optimal. In contrast, individuals with income above the equally distributed equivalent ($y_i > y_{e,s}$), prefer more redistribution than if they were purely self-interested but less than is socially optimal.

Second, we prove part (B), which states that an individual i's preferred level of redistribution τ_i^* is decreasing in individual income y_i. Formally, we seek to demonstrate that $\partial \tau_i^*/\partial y_i < 0$. Totally differentiating the first-order condition in Equation (A.8), we obtain

$$\frac{d\tau_i^*}{dy_i} = -\frac{(1 - \delta)\left\{u''(c_i)\left[(1 - \tau)\bar{y} - y_i\right](1 - \tau) - u'(c_i)\right\}}{\sigma(\tau_i^*, y_i, y_{e,s})}. \tag{A.13}$$

Since the expression in the denominator is negative, the sign of the derivative depends on the sign of the numerator. For $(1 - \tau)\bar{y} \geq y_i$, the numerator is clearly negative. For $(1 - \tau)\bar{y} < y_i$, the numerator is negative if the following condition holds: $u''(c_i)[(1 - \tau)\bar{y} - y_i](1 - \tau) - u'(c_i) < 0$. This condition reduces to $(1 - \epsilon)y_i + \epsilon(1 - \tau)\bar{y} + T/(1 - \tau) > 0$, which is true for all $\epsilon \in (0, 1)$, all $y_i \in [0, \infty)$, and all $\tau \in [0, 1]$. Hence, we have $\partial \tau_i^*/\partial y_i < 0$. This proves part (B).

Third, we prove part (C). Part (C) states that an individual i's preferred level of redistribution τ_i^* is increasing in inequality Q_s. Formally, we demonstrate that $\frac{\partial \tau_i^*}{\partial Q_s} > 0$. From Lemma 1, we can express a change in inequality as an increase in Q_s: $y_{e,s} = Q_0 - Q_s$. Totally differentiating the first-order

condition in Equation (A.8), we obtain

$$\frac{d\tau_i^*}{dQ_s} = -\frac{\delta\left\{-u''(c_{e,s})\left[(1-\tau)\bar{y} - y_{e,s}\right](1-\tau) + u'(c_{e,s})\right\}}{\sigma(\tau_i^*, y_i, y_{e,s})}. \tag{A.14}$$

Once again, since the expression in the denominator is negative, the sign of the derivative depends on the sign of the numerator. The numerator is clearly positive for $(1-\tau)\bar{y} \geq y_{e,s}$. For $(1-\tau)\bar{y} \leq y_{e,s}$, the expression in the numerator is positive if the following condition holds: $-u''(c_{e,s})[(1-\tau)\bar{y} - y_{e,s}](1-\tau) + u'(c_{e,s}) > 0$. This condition reduces to $(1-\epsilon)y_{e,s} + \epsilon(1-\tau)\bar{y} + T/(1-\tau) > 0$, which is true for all $\epsilon \in (0,1)$, all $y_{e,s} \in [0,\bar{y}]$, and all $\tau \in [0,1]$. Hence, we have $\partial\tau_i^*/\partial Q_s > 0$.

Fourth, we prove part (D). Part (D) states that the effect of an increase in inequality Q_s on an individual i's preferred level of redistribution τ_i^* is increasing in individual income y_i. Formally, this is equivalent to $\partial^2\tau_i^*/(\partial Q_s\partial y_i) \geq 0$. Furthermore, this will be true if and only if $\epsilon > 0$, otherwise $\partial^2\tau_i^*/(\partial Q_s\partial y_i) = 0$. We demonstrate this second claim first. Using the version of the first-order condition in Equation (A.10), set $\epsilon = 0$. We can then rewrite (A.10) as:

$$\tau_i^* = (1-\delta)\left(1 - \frac{y_i}{\bar{y}}\right) + \delta\left(1 - \frac{y_{e,s}}{\bar{y}}\right). \tag{A.15}$$

It is immediate from this that $\frac{\partial\tau_i^*}{\partial Q_s} = \frac{\delta}{\bar{y}}$ and therefore that $\partial^2\tau_i^*/(\partial Q_s\partial y_i) = 0$. This proves that $\epsilon \neq 0$ is a necessary condition for $\partial^2\tau_i^*/(\partial Q_s\partial y_i) > 0$. Establishing the rest of the proof will demonstrate sufficiency.

We begin by showing that $\partial^2\tau_i^*/(\partial Q_s\partial y_i) > 0$ for all $y_i \in [0, y_{e,s})$. By factoring out $\delta c_e^{-\epsilon}$ from the numerator and denominator, rewrite the expression for $\partial\tau_i^*/\partial Q_s$ from Equation (A.14) as:

$$\frac{d\tau_i^*}{dQ_s} = \frac{A}{MB + C}, \tag{A.16}$$

where

$$A = \frac{\epsilon[(1-\tau)\bar{y} - y_{e,s}](1-\tau)}{c_{e,s}} + 1 > 0,$$

$$M = \left(\frac{1-\delta}{\delta}\right)\left(\frac{c_{e,s}}{c_i}\right)^\epsilon > 0,$$

$$B = \frac{\epsilon[(1-\tau)\bar{y} - y_i]^2}{c_i} + \bar{y} > 0,$$

and

$$C = \frac{\epsilon[(1-\tau)\bar{y} - y_{e,s}]^2}{c_{e,s}} + \bar{y} > 0.$$

We need to show that the following is true:

$$\frac{\partial^2 \tau_i^*}{\partial Q_s \partial y_i} = \frac{\frac{\partial A}{\partial y_i}(MB + C) - A\left(\frac{\partial M}{\partial y_i}B + M\frac{\partial B}{\partial y_i} + \frac{\partial C}{\partial y_i}\right)}{(MB + C)^2} > 0. \quad \text{(A.17)}$$

Differentiating A with respect to y_i, we obtain:

$$\frac{\partial A}{\partial y_i} = -\left(\frac{\epsilon[(1-\tau)\bar{y} - y_{e,s}] + \epsilon(1-\tau)\bar{y}}{c_{e,s}}\right.$$

$$\left. + \frac{\epsilon(1-\tau)[(1-\tau)\bar{y} - y_{e,s}]^2}{c_{e,s}^2}\right)\frac{\partial \tau_i^*}{\partial y_i}. \quad \text{(A.18)}$$

For $y_i < y_{e,s}$, we have $[(1-\tau)\bar{y} - y_{e,s}] < 0$, which makes the first term within the parentheses ambiguous and the second term positive. However, since $y_i < y_{e,s}$ makes the first term in A negative and $[(1-\tau)\bar{y} - y_{e,s}] \to 0$ as $y_i \to y_{e,s}$, the expression must be positive (since $-\partial \tau_i^*/\partial y_i > 0$). This implies $\frac{\partial A}{\partial y_i}(MB + C) > 0$. Next, we have:

$$\frac{\partial M}{\partial y_i} = \epsilon\left(\frac{1-\delta}{\delta}\right)\left(\frac{c_{e,s}}{c_i}\right)^\epsilon$$

$$\times \left[\left(\frac{[(1-\tau_i^*)\bar{y} - y_{e,s}]}{c_{e,s}} - \frac{[(1-\tau_i^*)\bar{y} - y_i]}{c_i}\right)\frac{\partial \tau_i^*}{\partial y_i} - \frac{(1-\tau_i^*)}{c_i}\right]. \quad \text{(A.19)}$$

For $y_i < y_{e,s}$, we have $[(1-\tau_i^*)\bar{y} - y_i] > 0$ and $[(1-\tau_i^*)\bar{y} - y_{e,s}] < 0$. This makes the parenthetical term within brackets positive. However, because the gross income effect dominates the redistribution effect, the negative term, $-(1-\tau_i^*)/c_i$, dominates the positive term within parentheses. This makes the whole expression negative and therefore, $-A(\partial M/\partial y_i)B > 0$.

Next, we have:

$$\frac{\partial B}{\partial y_i} = -\frac{2\epsilon[(1-\tau)\bar{y} - y_i]}{c_i} - \frac{\epsilon[(1-\tau)\bar{y} - y_i]^2(1-\tau)}{c_i}$$

$$- \left(\frac{2\epsilon[(1-\tau)\bar{y} - y_i]\bar{y}}{c_i} + \frac{\epsilon[(1-\tau)\bar{y} - y_i]^3}{c_i^2}\right)\frac{\partial \tau_i^*}{\partial y_i}. \quad \text{(A.20)}$$

Once again, we have $[(1-\tau)\bar{y} - y_i] > 0$, which makes the first two terms negative, but the second two terms positive, since $-\partial \tau_i^*/\partial y_i > 0$. However, since in B $[(1-\tau)\bar{y} - y_i]^2 > 0$ and $[(1-\tau)\bar{y} - y_i] \to 0$ as $y_i \to y_{e,s}$, the first negative "income" effect must dominate the second, positive "tax" effect. Therefore, $-AM\frac{\partial B}{\partial y_i} > 0$.

Finally, we have

$$\frac{\partial C}{\partial y_i} = -\left(\frac{2\epsilon[(1-\tau)\bar{y} - y_{e,s}]\bar{y}}{c_{e,s}} + \frac{\epsilon[(1-\tau)\bar{y} - y_{e,s}]^3}{c_e^2}\right)\frac{\partial \tau_i^*}{\partial y_i}, \qquad (A.21)$$

which, since $[(1-\tau)\bar{y} - y_{e,s}] < 0$ for $y_i < y_{e,s}$, must be negative. Therefore, $-A(\partial C/\partial y_i) > 0$ and we conclude that Equation (A.17) is positive.

Observe that for $y_i = y_{e,s}$, $[(1-\tau)\bar{y} - y_{e,s}] = 0$ and $[(1-\tau)\bar{y} - y_i] = 0$. Using this fact, we get $d\tau_i^*/dQ_s = \delta/\bar{y}$. Hence at $y_i = y_{e,s}$, $\partial^2 \tau_i^*/(\partial Q_s \partial y_i) = 0$.

For $y_i \in (y_{e,s}, \hat{y}]$, it is easiest to show that $\partial^2 \tau_i^*/(\partial Q_s \partial y_i) > 0$ by making an analogous argument using the expression for $\partial \tau_i^*/\partial y_i$ given in Equation (A.13). In that case, we show that $\partial^2 \tau_i^*/(\partial y_i \partial Q_s) > 0$. Since $\partial^2 \tau_i^*/(\partial y_i \partial Q_s)$ and $\partial^2 \tau_i^*/(\partial Q_s \partial y_i)$ are equivalent, this proves that $\partial^2 \tau_i^*/(\partial Q_s \partial y_i) \geq 0$ for all $y_i \in [0, \infty)$ and this concludes the proof. $\qquad \square$

B   Alternative Models of Preferences

B.1   *Inequity Aversion*

Using the form of inequity aversion proposed by Fehr and Schmidt (1999), other-regarding preferences takes the form:

$$\Omega^I = -\alpha\frac{1}{n-1}\sum_{j\neq i}\max\{c_j - c_i, 0\} - \beta\frac{1}{n-1}\sum_{j\neq i}\max\{c_i - c_j, 0\}. \qquad (B.1)$$

Note that, according to Fehr and Schmidt, inequity aversion is a function of individuals' *monetary payoffs* rather than their utilities (ibid., p. 822). We make the same assumption in order to distinguish the implications of their argument form ours.

In Fehr and Schmidt's conception, an individual evaluates inequality differently depending on her income relative to others. Inequality of incomes that is greater than the income of a given individual i is termed "disadvantageous inequality" or envy. Envy is captured by the first term in (B.1) and weighted by α. Meanwhile, inequality of incomes that is below an individual i is called "advantageous inequality" or altruism. Altruism is captured by the second term in (B.1) and weighted by β. The critical restriction that Fehr and Schmidt place on their version of other-regarding preferences is that $\beta \leq \alpha$ and $0 \leq \beta < 1$, which implies that concern about advantageous inequality is weighted less than concern about disadvantageous inequality. Alternatively, one could say that individuals are more envious than they are altruistic. This assumption has important implications for redistributive preferences, which we will soon see.

The following proposition states how inequity aversion influences preferences for redistribution and in particular how a change in inequality changes those preferences.

Proposition B.1. *Under inequity-aversion preferences, the preferred tax rate, τ_i^* is decreasing in income y_i and increasing in inequality. Furthermore, for any two individuals i and j with gross incomes $y_i < y_j$, a mean-preserving increase in income inequality either does not change, increases by the same amount, or increases i's demand for redistribution more than j's.*

Proof.
For this problem, each individual chooses a tax rate to maximize her utility specified by Equation (4) with Ω given by Equation (B.1), subject to her budget constraint in Equation (3) and the government's budget constraint in Equation (2). Recall that for Fehr and Schmidt, individuals have linear (non-concave) utility functions, so $u(c_i) = c_i$. The first-order condition for this problem gives:

$$(1 - \tau)\bar{y} - y_i + \Omega_\tau^I = 0. \tag{B.2}$$

Rearranging terms, we can solve for an individual i's preferred level of redistribution:

$$\tau_i^I = 1 - \frac{y_i}{\bar{y}} + \frac{1}{\bar{y}}$$

$$\times \left(\alpha \frac{1}{n-1} \sum_{j \neq i} \max\{y_j - y_i, 0\} + \beta \frac{1}{n-1} \sum_{j \neq i} \max\{y_i - y_j, 0\} \right). \tag{B.3}$$

Since the expression within parentheses is strictly positive for all y_i, inequity-aversion preferences increase the income threshold for a positive level of preferred redistribution.

Next, we show that the preferred level of redistribution is decreasing in income. First, define the following convenient terms for disadvantageous and advantageous gross income inequality, respectively, Y_i^- and Y_i^+:

$$Y_i^- = \frac{1}{n-1} \sum_{j \neq i} \max\{y_j - y_i, 0\}, \tag{B.4}$$

$$Y_i^+ = \frac{1}{n-1} \sum_{j \neq i} \max\{y_i - y_j, 0\}. \tag{B.5}$$

Accordingly, observe that Y_i^- decreases as y_i increases and that Y_i^+ increases as y_i increases. Also note that $Y_N^- = 0$ and $Y_1^+ = 0$. Further note that

$Y_1^- > Y_N^+$. Then, taking the difference between the preferred policies of i and n we obtain:

$$\tau_i - \tau_N = \frac{1}{\bar{y}} \left[y_N - y_i + \alpha Y_i^- - \beta(Y_N^+ - Y_i^+) \right]. \qquad \text{(B.6)}$$

Then, since $\beta \leq \alpha$, and $y_N - y_i > 0$ and $Y_i^- > Y_N^+ - Y_i^+$ for all $i \in \{1, 2, \ldots, n\}$, this expression will be positive for all $i < n$. Furthermore, since $y_N - y_i$, Y_i^-, and $Y_N^+ - Y_i^+$ are all decreasing in y_i, the difference $\tau_i - \tau_N$ is decreasing in y_i, Thus, the poor prefer more redistribution than the rich and an individual's preferred level of redistribution is decreasing in her income.

Finally, we show that an increase in inequality will increase the demand for redistribution more for the poor than for the rich. Consider an increase in inequality between two individuals k and l with gross incomes $y_k < y_l$ such that for a change in income Δ the result is $y_k - \Delta$ and $y_l + \Delta$. Then for any two individuals i and j with incomes $y_i < y_j$, three consequences are possible. First, if $y_j > y_i > y_l + \Delta$ or $y_k - \Delta > y_j > y_i$ or $y_j > y_l + \Delta > y_k - \Delta > y_i$ then the redistribution preferences of both i and j do not change, since neither is disadvantaged by the increase in inequality. Second, if $y_l + \Delta > y_j > y_i > y_k - \Delta$, then both are disadvantaged by the increase in inequality and both increase their demand for redistribution by the same amount. The third case is where $y_j > y_l + \Delta > y_i > y_k - \Delta$. In this case, i is disadvantaged by the increase in inequality while j is not. Thus, the preferred level of redistribution will increase for the poorer individual but not for the richer individual.   □

B.2   Fairness

A third specification of other-regarding preferences is proposed by Alesina and Angeletos (2005), which we call "fairness" preferences. We call these fairness preferences because the basic idea is that individuals have both "earned" or "fair" income as well as "unearned" or "unfair" income, and that only "unfair" income comes at a utility cost to individuals. Thus, inequality of final outcomes is not of concern to individuals, and individuals may tolerate a high degree of inequality, provided that it is "fair." In this model, fair income is denoted $\hat{y}_i$ and is equal to y_i in our previous models. Likewise, unfair income, obtained through lucky or illicit transactions, is denoted η_i. Unearned income η_i is assumed to have zero mean and to be independently distributed from $\hat{y}_i$. Total gross income is then defined as:

$$y_i = \hat{y}_i + \eta_i \qquad \text{(B.7)}$$

and we can note that $\eta_i = y_i - \hat{y}_i$.

With fairness preferences, other-regarding utility takes the form

$$\Omega^F = -\gamma \frac{1}{N} \sum_{i=1}^{N} (c_i - \hat{c}_i)^2, \qquad \text{(B.8)}$$

where, with y_i suitably redefined by Equation (B.7), disposable income c_i is given by Equation (3) and $\hat{c}_i = \hat{y}_i$ is "fair" disposable income. Note that, in agreement with Alesina and Angeletos, and to make clear the distinctive implications of their argument, we assume that individuals' have linear (non-concave) utility functions and therefore that their utility is equivalent to their monetary consumption. Given the independence of η_i and $\hat{y}_i$, other-regarding utility in Equation (B.8) can be rewritten as:

$$
\Omega^F = -\gamma \left[\tau^2 \frac{1}{N} \sum_{i=1}^{N} \left(\hat{y}_i + \frac{1}{2}\tau - \bar{y} \right)^2 + (1-\tau)^2 \frac{1}{N} \sum_{i=1}^{N} \left(y_i - \hat{y}_i \right)^2 \right]
$$
$$
= -\gamma \left[\tau^2 \text{Var}(\hat{y}_i) + (1-\tau)^2 \text{Var}(y_i - \hat{y}_i) + \frac{1}{2}\tau^4 \right]. \tag{B.9}
$$

Thus, other-regarding utility can be decomposed into the variances of fair and unfair gross income, weighted by the tax-and-transfer policy level. The following proposition states the implications we obtain from the fairness model of other-regarding utility.

Proposition B.2. *Under fairness preferences, the preferred tax rate, τ_i^*, is decreasing in income y_i and decreasing in inequality. Furthermore, the effect of an increase in income inequality on an individual's preferred tax rate is decreasing in an individual's income.*

Proof.
  With fairness preferences, an individual chooses the tax-and-transfer policy to maximize her utility subject to the the budget constraint in Equation (3), the government's budget constraint in (2), and other-regarding preferences as defined by Alesina and Angeletos (2005) in Equation (B.8). Recall that in this case, own utility is equivalent to consumption. Differentiating this expression leads to the following first-order condition:

$$
-y_i + \bar{y}(1-\tau) - \gamma \left[2\tau \text{Var}(\hat{y}_i) - 2(1-\tau)\text{Var}(y_i - \hat{y}_i) + 2\tau^3 \right] = 0. \tag{B.10}
$$

Rearranging and simplifying the first-order condition gives us:

$$
\tau_i^F = 1 - \frac{y_i}{\bar{y}} - \frac{\gamma}{\bar{y}} \left[2\tau \text{Var}(\hat{y}_i) - 2(1-\tau)\text{Var}(y_i - \hat{y}_i) + 2\tau^3 \right]. \tag{B.11}
$$

Clearly, as in previous results, an individual's preferred level of redistribution is decreasing in income. Since the expression within brackets does not change across individuals and their income, y_i has the same effect on redistributive preferences as it does in the model of self-interested preferences.
  Finally, it is straightforward to observe that an increase in earned-income inequality reduces an individual's preferred level of redistribution. Consider

two individuals, j and k with $y_j < y_k$, and suppose that there is a change of earned income, such that inequality increases: $y_j' = y_j - \Delta$ and $y_k' = y_k + \Delta$. Differentiating the earned income variance term $\text{Var}(\hat{y}_i)$ in Equation (B.10) with respect to Δ gives $2(y_k - y_j) > 0$. Thus, an increase in inequality will increase the variance in earned income. Next, applying the implicit function theorem to Equation (B.10), we obtain:

$$\frac{d\tau_i^F}{d\Delta} = \frac{\gamma 2\tau \partial \text{Var}(\hat{y}_i)/\partial \Delta}{-\bar{y} - \gamma \left[2\text{Var}(\hat{y}_i) + 2\text{Var}(y_i - \hat{y}_i) + 6\tau^2\right]} < 0. \tag{B.12}$$

Since the numerator of this expression is positive while the denominator is negative, the whole expression is negative. Hence, an individual's optimal level of redistribution decreases as earned income inequality increases.

Finally, the effect of an increase in inequality on an individual's preferred tax rate is also decreasing in income. Although an individual's income y_i does not appear directly in Equation (B.12), if affects it indirectly through τ. Thus, as y_i increases, the numerator of expression (B.12) goes to zero while the denominator remains strictly non-zero. Hence the negative effect given in (B.12) decreases (in absolute value) as y_i increases. $\qquad \square$

C   Deriving the Full Estimating Equation

From the first order condition of individual i's utility function in Equation (4) we derive the theoretical function $\tau_i^*(y_i, Q_s)$, which represents i's preferred level of redistribution, τ_i^*, given i's income, y_i, and the level of inequality, Q_s. The second-order Taylor expansion of $\tau_i^*(y_i, Q_s)$ is given by:

$$\tau_i^* = x + \frac{\partial \tau_i^*}{\partial y_i} y_i + \frac{\partial \tau_i^*}{\partial Q_s} Q_s + \frac{\partial^2 \tau_i^*}{\partial Q_s \partial y_i} Q_s y_i + \frac{1}{2} \frac{\partial^2 \tau_i^*}{\partial y_i^2} y_i^2 + \frac{1}{2} \frac{\partial^2 \tau_i^*}{\partial Q_s^2} Q_s^2. \tag{C.1}$$

Thus our full regression equation takes the form:

$$\tau_i^* = ax + by_i + cQ_s + dQ_s y_i + 0.5ey_i^2 + 0.5fQ_s^2. \tag{C.2}$$

Here, we measure τ_i^* by R_i, an individual's continuous (categorical) stated preference for redistribution, just as we did in Specification (4) in Table 2. Estimating Equation (C.2) using nonlinear least squares (using HC2 corrected "robust" standard errors) we confirm the result for our central prediction that $\partial^2 \tau_i^* / (\partial Q_s \partial y_i) > 0$. Numerically, the estimated marginal effect is 0.329 with a standard error of 0.077, while with the "reduced" model used in the main text we obtained an estimate of 0.379, with s.e. 0.075.

D   Descriptive Statistics

The descriptive statistics are given in Table D.1.

Table D.1: Descriptive statistics.

Continuous variables	Mean	SD	Min	Max
Income distance [10.000$]	0.087	3.592	−5.687	12.542
Inequality (Atkinson)	0.249	0.047	0.164	0.405
Age [10 yrs]	3.980	1.168	2.000	6.500
Education [yrs]	13.354	2.855	0.000	20.000
State unemployment [%]	6.183	2.030	2.300	17.400
Indicator variables	%			
Female	53.9			
Black	13.4			
Other race	5.4			
Part-time employed	11.9			
Unemployed	6.3			
Self-employed	11.4			

E   Bootstrap Standard Errors

Table E.1 contains all four specifications used in the main text, but adds cluster bootstrap standard errors (given in brackets).

Table E.1: Income, inequality, and redistribution preferences.

	(1)	(2)	(3)	(4)
Income	−0.126	−0.105	−0.106	−0.189
	(0.016)	(0.016)	(0.016)	(0.020)
	[0.017]	[0.016]	[0.016]	[0.021]
Inequality	1.402	0.696	0.994	2.195
	(0.531)	(0.501)	(0.838)	(1.140)
	[0.599]	[0.590]	[0.840]	[1.321]
Income×inequality	0.209	0.208	0.210	0.379
	(0.058)	(0.058)	(0.059)	(0.075)
	[0.065]	[0.058]	[0.060]	[0.077]
Controls	No	Yes	Yes	Yes
Deviance	22,172	21,718	21,640	—
BIC	22,409	22,063	22,448	—
N	19,025	19,025	19,025	19,025

Note: Estimates with analytical standard errors in parentheses and cluster-bootstrap standard errors in brackets.
Specifications: (1), (2) Random effects, maximum likelihood estimates; (3) fixed effects, maximum likelihood estimates; (4) fixed effects, linear probability model. Bootstrap standard errors based on 500 re-samples within state panels.

F   Envy

In this subsection, we expand on model specifications we conducted to asses how likely it is that our results are driven by respondents' envy instead of inequity aversion. In Table F.1 we present the results of two calculations. Just like in our model in the main text, specification (1) uses the full distribution of incomes to calculate the Atkinson index of inequality. Specification (2) uses the share of income held by the top 1% of income earners, calculated from IRS tax returns following the methodology of Piketty and Saez (2003). The table entries are average marginal effects of inequality and top 1% income shares, respectively, calculated for what we term "the Rich" (those at the 90th percentile of the income distribution).

If inequity aversion is predominantly driven by envy, we expect the average marginal effect among the rich to be noticeably larger in Specification (2) compared to Specification (1). However, contrary to this expectation, we find the effect of 1% top income shares among the rich to be reduced by 38%. While our available data does not allow us to draw a firm, "once-and-for-all" conclusion on this issue, these results do point towards income-dependent altruism being the dominant mechanism, not envy.

Table F.1: Average marginal effect of inequality among the Rich using two different concepts of inequality.

	$AME(Q|Y = y_R, X)$	
(1) Income inequality	0.489	(0.157)
(2) Top 1% income share	0.303	(0.176)

Note: Based on specification 2.

G   CPS Income Data

For confidentiality reasons, the Current Population Survey public use files employ a system of top-codes to protect the confidentiality of respondents (both those with very high and very low incomes). In CPS's March Annual Social and Economic Supplement used here, different top-codes are used for the various income components that make up individual income, and, by extension, household income. The share of individual records affected by top-coding has risen from about 1% in 1978 to almost 6% in 2007 (Larrimore *et al.*, 2008, p. 96). Clearly, truncating the distribution of income affects estimates of household income and inequality (see Burkhauser *et al.*, 2010; Feng *et al.*, 2006 for the importance of accounting for censoring when calculating measures of inequality).

Larrimore *et al.* (2008) use restricted (internal) CPS data to generate average income values for cells of top-coded individuals defined by a range of social characteristics. They show that using such replacement values to impute top-coded income produces income distributions (and derived measures) very close to those produced using restricted-use CPS data. The Census Bureau publishes a similar series of replacement values based on a rank proximity swap value method.[38] We use this series to address top-coding in CPS data using the following steps. (1) We assign census replacement values for each top-coded income component of an individual. (2) We sum all income components to generate a measure of individual income adjusted for top-coding. (3) We sum the incomes of all household members to generate a measure of household income. This new measure is the basis for all our calculations using the CPS.

H   National Inequality

Following the suggestion of one of our reviewers, we study if the income-conditional effect of inequality is also visible on the national level. Figure 4 in the main text shows a secular increase in inequality throughout the states. In this subsection, we substitute our state-level measures of inequality (which provides 1,078 state-year values of inequality) with 22 measured levels of inequality on the national level. We estimate a simplified linear model including the same individual level controls as in the main text. We account for the fact that respondents are nested in survey years by using clustered standard errors. Table H.1 shows average marginal effects of national inequality among the rich and the poor (defined, as before, as those at the 90th and 10th percentile of the national income distribution). Complementarily, Figure H.1 plots expected values of redistribution preferences among rich and poor for rising levels of inequality. Note that the national distribution of income inequality is more compressed than the state-level one (the largest observed national value is 0.328 in 2006, while it was 0.405 in Connecticut in the same year.)

Even when using more limited information (and variability) on the country-level over time, we see the basic pattern in our model. As inequality increases (all else equal) the rich tend to be more supportive of redistribution. The average marginal effect of a unit change in national income inequality on preferences for redistribution among the rich is almost 2 points. Among the poor, changing inequality is not systematically related to preferences. We also test if the difference in inequality marginal effects between rich and poor is significantly different from zero and cannot reject the null hypothesis that they are not ($p = 0.001$).

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[38]See www.census.gov/srd/papers/pdf/rr96-4.pdf for details on the methodology, and www.census.gov/housing/extract_files/toc/data/ for published replacement values.

Table H.1: Marginal effect of national inequality among poor and rich.

Marginal effect of inequality		
(1) Among the poor	−0.838	(0.994)
(2) Among the rich	1.945	(0.777)
Diff. (1) − (2)	*p=0.001*	

Note: $T = 22$. Average marginal effects from linear regression model. Clustered standard errors
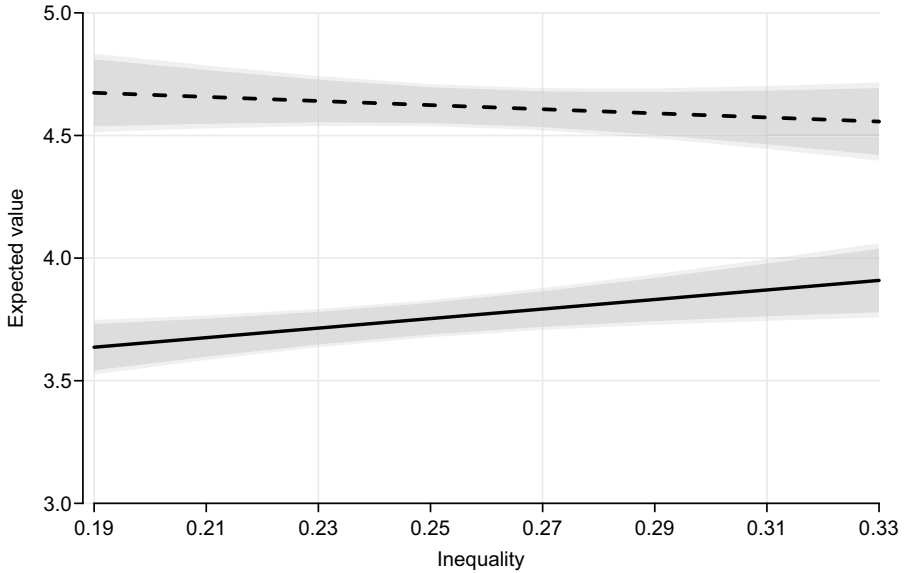Difference test is distributed F with 1df.

Figure H.1: Income-dependent altruism: the effect of an increase in *national* inequality on
redistribution preferences among the rich (solid line) and the poor (dashed line).

I   Importance of National Redistribution for Individual States

In this section we illustrate the importance of *national* redistribution to
citizens in individual states. First, we evaluate the condition outlined in
Proposition 1 (C), namely that equally distributed equivalent income in each
state is below the national mean. We then show that, in each state-year,
the distribution of incomes makes a seizable number of individuals likely
beneficiaries of redistributive policies; and we show that each state does indeed
receive a seizable number of *federal* transfers. First, we calculate the difference
between national income and equally distributed equivalent income in each

state and find that the latter is generally below (or at) the former. Second, we calculate the state-level share of individuals with incomes below the national mean (making them likely recipients of redistributive transfers). Third, we calculate how federal resources are disbursed to citizens in each state (via direct transfers and social programs).

I.1 Evaluating the Condition $y_e < \bar{y}$ in Each State-year

To evaluate if $y_e < \bar{y}$, we need estimates of y_e by state-year and $\bar{y}$ by year. We use March CPS data (see Appendix G) to calculate mean income in each year, and equally distributed equivalent income in each state-year. The latter
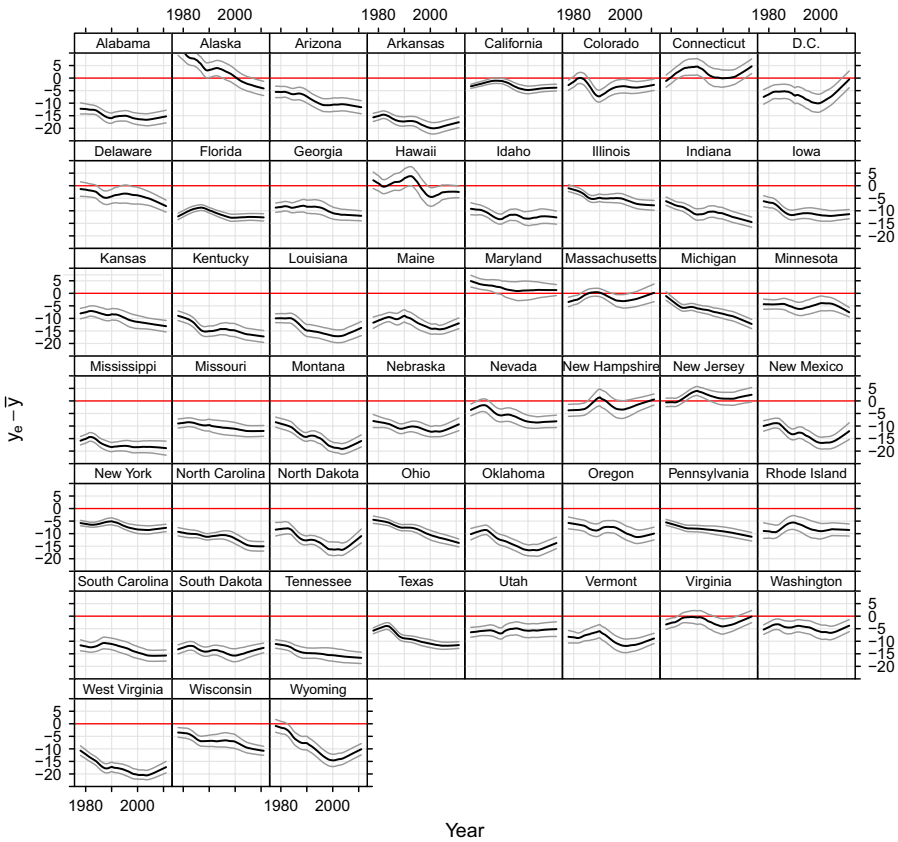

Figure I.1: Difference between state equally distributed equivalent income and national average income (with 95% confidence intervals). In 1000s of constant 1999 dollars.

is given by (cf. Lemma 1):

$$\left(\frac{1}{N} \sum_{i=1}^{N} y_{i,s}^{1-\epsilon} \right)^{1/(1-\epsilon)} .$$

Our calculations account for top-coding of incomes as well as for the sampling design of the CPS. We then calculate the difference $y_e - \bar{y}$ taking into account its estimation uncertainty.[39] Figure I.1 plots the resulting differences by state and year. It shows that the data generally support our assumption: in the
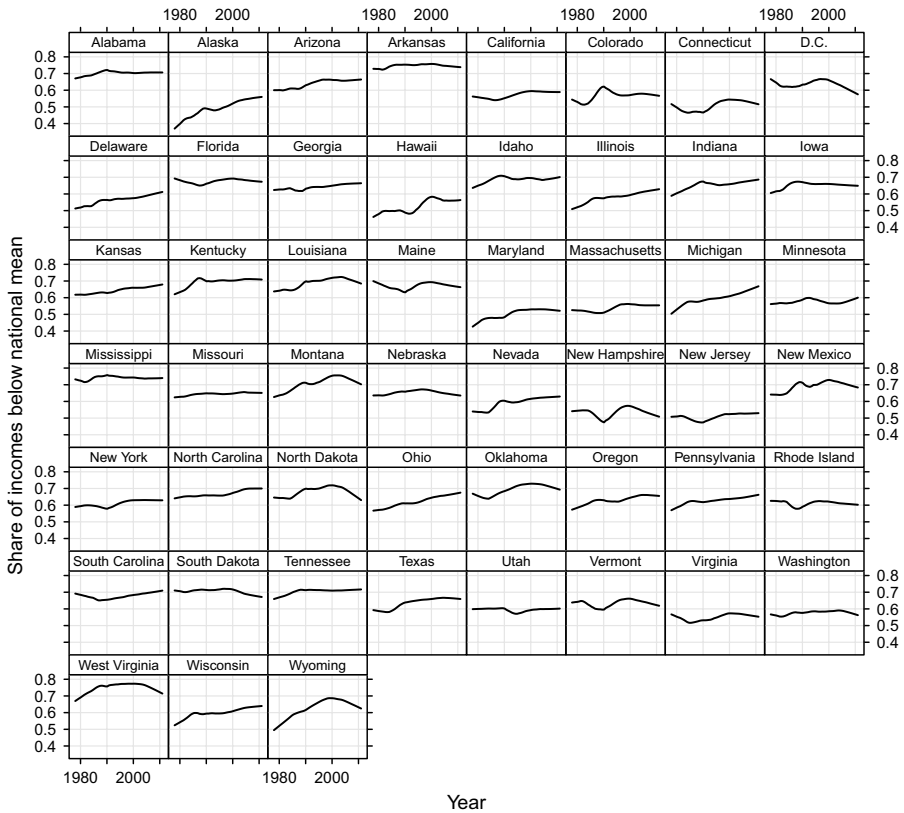

Figure I.2: Share of household incomes below the national mean in each state.

[39]Uncertainty for the national mean is simply the (analytical) standard error of the mean, while we assess the uncertainty of state equally distributed equivalent income using 100 bootstrap replicates. We calculate a 95% confidence interval around the difference via Monte Carlo simulation using 1,000 draws.

vast majority of states y_e is below or at the national mean, $\bar{y}$; in cases where both are close they are not statistically distinguishable from each other. The clear exceptions are Alaska, where equivalent income is above the national mean up to 1990, and Maryland, where it is above the national mean until the mid-eighties.

I.2 Share of State Income Below National Mean

We calculate the share of household incomes in each state in each year that fall below the national average from March CPS data. Household income data is adjusted for top-coding and sample inclusion probability, and deflated to 1999 as described in Section G. Figure I.2 shows that in each state, in each year, at least 40% of household incomes fall below the national mean income. Furthermore, there is slight evidence for a convergence over time: by year 2000 the share of incomes below the national mean is at least 50% in all states.

I.3 Federal Transfers to Citizens in States

We calculate the average dollar amount of federal transfers received by an individual in a given state in a given year. We use data from the Bureau of Economic Analysis' Regional Economic Accounts, specifically the Annual series of State Personal Income and Employment, which is used by the federal

Table I.1: BEA federal transfer components included in federal transfer measure.

2110	Social Security Benefits
2121	Railroad retirement and disability benefits
2210	Medicare benefits
2230	Military medical insurance benefits
2310	Supplemental Security Income (SSI)[a]
2330	Supplemental Nutrition Assistance Program
2421	Unemployment compensation for Fed. Civilian employees (UCFE)
2422	Unemployment compensation for railroad employees
2423	Unemployment compensation for veterans (UCX)
2424	Other unemployment compensation
2510	Veterans pension and disability benefits
2520	Veterans Readjustment benefits
2530	Veterans life insurance benefits
2600	Education and training assistance[a]
2700	Other transfer receipts of individuals from governments[a]

[a]Includes a small percentage of income that originates from state governments

government to allocate funds.[40] It includes detailed information on individuals'
current transfer receipts (Table SA35). We include budget items representing
direct transfers from federal agencies to individuals in a state. Transfers to
individuals from states' budgets (which are in part financed by the federal level)
are not included. Included budget items are listed in Table I.1. We deflate
transfer amounts to 1999 dollars and divide them by the state population
to yield average transfers to individuals in a given state-year. Figure I.3
reproduces the conventional wisdom that the importance of federal transfers
has increased over time. But it also shows that even in states receiving
fewer transfers, national redistribution still matters. For example, in the late
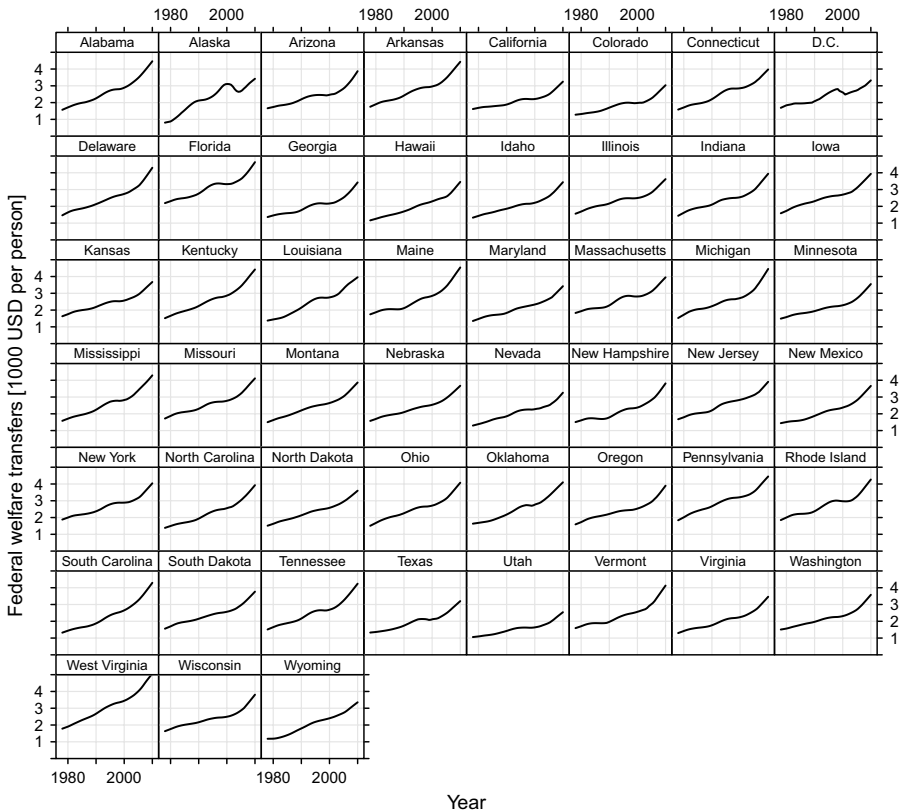

Figure I.3: Federal welfare transfers to individuals in state. Transfers per person in 1000s of
constant 1999 dollars.

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[40]These state estimates of personal income are consistent with (i.e., sum to) the national
estimates of personal income in the National Income and Product Accounts (NIPA).

sventies even Alaska received almost 1,000 real dollars per inhabitant in federal transfers.

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