

# Are We in the Same Boat or Not? The Opposite Effects of Absolute and Relative Income Shifts on Redistributive Preferences

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What are the effects of economic mobility and macroeconomic cycles on redistributive preferences? These questions have gained more prominence in recent years, yet our main theoretical frameworks often provide conflicting predictions and empirical evidence has been contradictory. We argue that this confusion is mostly due to the crucial distinction between absolute and relative income shifts, both of which are produced during economic cycles yet are rarely separated conceptually or empirically. After relative income shifts, differences are made salient, resulting in more self-interested behavior. Conversely, after absolute income shifts, similarities become more apparent, resulting in more group-driven behavior. We demonstrate this experimentally, using a novel “redistribution game.” The results indicate that expected shifts in absolute and relative income have mostly opposite effects on preferences, highlighting the importance of carefully conceptualizing and measuring the effects of income shifts. This has implications for how we think about economic perceptions and evaluations.

**D**o the effects of economic mobility on redistributive preferences differ from the effects of macroeconomic cycles on redistributive preferences? Within political science, the literatures on these two closely connected relationships have so far failed to speak to each other. The literature on the effects of economic mobility generally adopts a standard political economy approach, which assumes that individuals faced with the prospect of moving up or down the income distribution will demand less or more social insurance, respectively (Bénabou and Ok 2001; Rehm, Hacker, and Schlesinger 2012). Contrast this with the literature on macroeconomic cycles, which is generally framed in terms of the public’s policy mood and which treats redistribution, and welfare policy more generally, as a luxury good. During times of a growing economy, individuals will demand more of the luxury good, as they expect the economy to do better in the future, while they will demand less during times of a struggling economy (Durr 1993; Stevenson 2001). Interestingly,

the two separate literatures thus make opposite predictions about the effects of expected income shifts on redistributive preferences.

How do we reconcile such conflicting theories? We argue that the reason for these opposing results is the crucial distinction between absolute and relative income shifts, both of which are produced during economic cycles but are rarely separated conceptually or empirically. An *absolute income shift* is a proportional increase or decrease in income that affects everyone equally (meaning an inequality- and rank-preserving income shift). As Lindert (2004) highlights, the Great Depression and the post-war economic boom can be classified as approximating such negative and positive absolute income shifts, respectively. A *relative income shift*, meanwhile, is a proportional increase or decrease in income that varies in size across individuals such that the relative income rank of individuals also changes. The two decades before the Great Recession, a period of “inequitable growth” (McCall

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2013), filled with “frustrated achievers” (Graham and Pettinato 2002), can be thought of as a stylized example of the latter phenomenon.<sup>1</sup>

It is this crucial distinction that separates political economy perspectives on redistribution, which prioritize the role of relative income (based on the basic Meltzer-Richard logic), and public opinion perspectives on social policy preferences, which emphasize the dominant role of absolute income (based on the idea of leftist policies as luxury goods). The political economy perspective emphasizes the importance of the inequality of risk and income (relative income), while the public opinion perspective emphasizes the importance of wanting to help others, which is conceptualized as a luxury good (absolute income). We argue that these separate perspectives can be combined into a theoretical framework on the effects of income shifts on redistributive preferences that can be used to understand empirical findings in both strands of the literature. This framework builds on recent work on perceptions of economic change (Duch, Palmer, and Anderson 2000; Stevenson and Duch 2013), social affinity (Barth, Finseraas, and Moene 2015; Lupu and Pontusson 2011), and other-regarding preferences (Lü and Scheve 2014).

Fundamentally, we argue that different types of income shifts trigger and make salient differences or similarities among individuals, which, in turn, affects redistributive preferences. Relative income shifts make differences between members of society salient. Under such conditions, self-interested income maximization more uniformly shapes preferences, suggesting that positive (negative) relative income shifts should decrease (increase) redistributive preferences. Conversely, absolute income shifts make similarities between members of society salient. The effects of such shifts crucially depend on whether absolute income is increasing or decreasing. A positive absolute income shift heightens the desirability of being similar to others, which leads to increased social affinity. Under such conditions, divisions within society are less desired, and inequality aversion becomes a stronger motivation, which implies an increase in redistributive preferences. However, a

negative absolute income shift reduces the desirability of being similar to others, which decreases social affinity. In such a scenario, inequality aversion plays a smaller role, which implies a decrease in redistributive preferences. Importantly, absolute and relative income shifts are predicted to have opposite effects on redistributive preferences.

We use an experimental design, borrowing on recent innovations in experimental political economy (Barber, Beramendi, and Wibbels 2013; Esarey, Salmon, and Barrilleaux 2012), to demonstrate that while both the absolute and the relative income perspectives are empirically accurate in their respective domains, neither theory is capable of explaining the other’s results. The design centers on a novel “redistribution game,” in which a group of subjects earn income through a real effort task and then vote on a group-wise tax rate. Crucially, the chosen tax rate is “sticky,” in that it also applies to a second-stage real effort task. The experimental manipulation involves altering the expectations subjects have about their future income, thus isolating the effects of different types of income shifts on self-interested (maximizing one’s own income across both rounds) and inequality-averse (decreasing post-transfer inequality across both rounds) tax choices. This is achieved while controlling for a series of relevant factors that are difficult to properly account for with observational data.

While we carefully isolate the role of income, which is known to have an important effect on redistributive preferences across contexts (Huber and Stanig 2009), and emphasize the importance of in-group solidarity and inequality aversion, we are under no illusions that no other factors matter. As such, our argument is empathically not a rejection of the potential role of other noneconomic issues, beliefs about economic fairness, consequences of existing policies, or the independent effect of political partisanship and institutions. Such factors clearly also help explain people’s redistributive preferences and the effects of economic mobility and macroeconomic cycles on public opinion (Alesina and Giuliano 2011). Instead, our goal is to explain the direct consequences of shifts in absolute and relative income, which, through their effects on social affinity and inequality aversion, we show can account for two different phenomena that have so far not been connected. In doing so, we also advance our understanding of variation in inequality aversion across contexts, a previously understudied phenomenon (e.g., Engel 2011), as well as highlight the importance of better measuring and conceptualizing economic mobility (e.g., Clark and D’Angelo 2013).

## RELATIVE INCOME AND THE PROSPECT OF ECONOMIC MOBILITY

The political economy literature on economic inequality has centered on the median voter model of Meltzer and Richard

1. We acknowledge that absolute income shifts at the aggregate level are unlikely to occur objectively in their purest form, although such shifts are likely to occur at the local level (e.g., in an employment setting or one’s social network), and the perception of such shifts undoubtedly occurs in various contexts (e.g., a person reacting to their income loss or gain without any consideration to others’ changes in income). A similar difficulty, albeit of a lesser degree, arises when attempting to measure a pure relative income shift. Empirically, virtually all economic shocks produce income effects that mix absolute and relative elements. In this article, we treat these effects as separate ideal types in order to provide conceptual and theoretical clarity. Our empirical analysis will similarly seek to isolate pure income effects, which will enable generalizations and extensions into the more complex scenarios encountered in most social contexts.

(1981), which assumes that an individual's redistributive preference will be determined by his/her relative income, where economically self-interested individuals below average income will prefer some positive level of income redistribution. To date, this perspective has dominated political economy thinking on redistribution.<sup>2</sup>

Two critical assumptions of the model is that individuals have perfect information about their position in the income distribution and that expectations of the future have no bearing on preferences. The static nature of the model has received considerable attention, with a number of scholars advancing a position that integrates expectations of future economic mobility into the baseline model. On the one hand, this has resulted in the literature on the prospect of upward mobility (POUM), which captures the self-interested logic that the more people expect to be rich in the future, the less they want to tax the rich right now (Bénabou and Ok 2001). On the other hand, the prospect of downward mobility (PODM) introduces the self-interested desire to insure against the possible loss of future income, such that those with higher economic insecurity will prefer more redistribution right now (Moene and Wallerstein 2001; Rehm 2009).<sup>3</sup>

While there is strong evidence that redistributive preferences are not static, there has been little work analyzing the effects of macroeconomic cycles on redistributive preferences, despite income shifts strongly affecting expectations of economic mobility (Duch and Stevenson 2010). More importantly, the political economy literature has mostly disregarded the role of absolute income shifts on redistributive preferences. For example, when discussing the effect of an absolute income shift, Meltzer and Richard (1981) acknowledge that it might matter by affecting the supply of labor and the dead-weight loss of taxation, but they do not establish in what directions such effects would occur nor do they suggest what the overall implications would be (923). Similarly, in their subsequent work, when providing a specific functional form to their previous general formulations, they highlight how the ultimate effect depends on the assumptions of marginal utility of consumption, which they leave unspecified (Meltzer

and Richard 1983). The same ambiguity exists with more recent models as well, since a proportional change in income, across all members of society, would preserve inequality and the gap between median and mean income, which are the factors of interest in most political economy models.<sup>4</sup>

Exceptions to this are recent models by Barth et al. (2015), Franzese and Hays (2008), and Markussen (2008), who consider the effects of absolute income shifts in more detail.<sup>5</sup> Barth et al.'s paper models party preferences for welfare spending by focusing on the demand for welfare spending per capita, but the effect of absolute income shifts on proportional taxation remains unclear. Thus, while absolute income shifts are predicted to affect aggregate welfare spending per capita, this is a direct result from the tax-base expanding and does not predict whether the chosen tax rate will change as well.<sup>6</sup> The same issue applies to Franzese and Hays's (2008) paper, although those researchers explicitly state that an absolute income shift would not affect the chosen tax rate (236). As our goal is to understand redistributive preferences, not aggregate welfare spending, these models do not speak directly to our research question.

Markussen (2008) focuses more directly on how absolute income shifts affect the chosen tax rate. Building on Moene and Wallerstein's (2001) model, Markussen demonstrates how an increase in income leads to increased demand for social insurance, in line with the policy mood argument. However, his model critically assumes that relative risk aversion is greater than one (i.e., that demand for social insurance rises with income), which empirical findings consistently contradict,

4. Moene and Wallerstein (2001), e.g., assume a relative risk aversion greater than 1, which implies that people want to insure a greater proportion of their income the higher the income, while they also assume that the marginal utility of consumption decreases with income. Consequently, it becomes difficult to pinpoint the exact effect of an absolute income shift on preferred levels of taxation, as the former effect is undermined by the latter effect, while the critical gap (or ratio) between median and mean incomes (the factor which they are concerned with) remains unchanged (863–65). Similar arguments apply to other models, such as Alt and Iversen (2014) and Bénabou and Ok (2001).

5. We thank an anonymous reviewer for pointing these out.

6. Formally, they define  $G = t\bar{w}/k$ , where  $k$  represents the cost of welfare spending,  $t$  the tax rate, and  $\bar{w}$  the average income. To put this in real-world terms, if a country experiences a per capita increase of some positive amount, the government would experience an increase in its budget, after discounting the cost of taxation, which would automatically result in greater welfare spending. However, the tax rate would remain unchanged, and thus the proportion of GDP raised by the government as revenue would remain unchanged (or even decrease). While this added revenue can be spent in more or less redistributive ways (an interesting, but separate question), such calculations are not necessarily shaped by the mere expansion of the tax base.

2. See Alesina and Giuliano (2011) for a recent review of the literature.

3. To simplify the discussion, we will treat "redistribution" as encompassing both assistance to the needy and social insurance. While these are distinct concepts, they are closely associated, both empirically and theoretically (see Cusack, Iversen, and Rehm 2006; Rehm et al. 2012). Furthermore, as our model allows for both upward and downward mobility, together with self-interested and altruistic inequality aversion, it makes more sense for analytical purposes to analyze a unified preference for redistribution and instead distinguish between self-interested and other-regarding redistributive preferences.

suggesting that demand for insurance decreases, rather than increases, with income (Rehm 2011). The assumption, furthermore, is at odds with the POUM hypothesis, discussed above, as the model is purely concerned with insurance dynamics, and thus it represents a less general framework than the one provided here.<sup>7</sup>

The overall intuition of these models is straightforward: while having more or less income than you did in the past might slightly affect your preferences for redistribution, it is overwhelmed by whether you are a net contributor or a net beneficiary of redistribution, which depends on your relative income (or risk) in society. Therefore, absolute income effects are not directly considered, as the focus lies on changes to relative income. Ultimately people are driven by a desire to maximize their income, but indirectly they form policy preferences by determining if they are rich or poor through a comparison with others. Moreover, as should be clear, a desire to help others less fortunate, or an aversion to inequality, is also generally absent in these models.<sup>8</sup>

#### **ABSOLUTE INCOME AND THE PUBLIC'S POLICY MOOD**

Scholars studying public opinion in the American context have established a connection between economic fluctuations and the public's "policy mood," meaning the public's support for more or less government activism, such as government spending on social policy, education, and health care (Stimson 1999). The support for liberal policies thus is similar to the support for income redistribution, as it largely focuses on redistributive policies. Durr (1993) finds that liberal policy mood in the United States is positively associated with expectations of economic conditions in the future. Since the latter is closely connected with economic conditions, the implication is that expected economic growth is positively associated with a liberal policy mood among the public. Stevenson (2001) expands this result to other countries, finding the same pattern across 14 Western democracies.

7. As will become clearer below, Markussen (2008) also provides a very different conceptualization of absolute income shifts. In his model, such effects are only important for an individual's pocketbook, to affect individual's self-interested demand for income insurance. In our view, this misses an important part of the effect: the signal that such an effect sends regarding the smaller social distance, or greater similarity, between members of society, which should affect other-regarding preferences, in the form of inequality aversion.

8. A recent exception in this literature is Rueda (2014). Note also the discussions in Barth et al. (2015) and Moene and Wallerstein (2001) on how the positive association between income insecurity and social insurance preference can be seen as a greater identification with, or desire to help, the poor, albeit with a clear benefit to economic self-interest.

The explanation for this general finding rests on the assumption of the diminishing marginal utility of income and wealth and the belief that liberal policies are "luxury goods" that are increasingly demanded as one's own basic needs are satisfied (Durr 1993; Stevenson 2001). The idea is that only once people feel satisfied with their economic conditions, both those of today and those expected in the future, will their need for security be met, which is required for them to pursue higher goals, such as increasing the welfare of others.<sup>9</sup> Compared to the political economy models, the predicted relationship between economic insecurity and redistributive policy preferences is now negative, rather than positive, as a worsening economy, partially by lowering expectations about future economic conditions, leads to less support for redistribution.<sup>10</sup> Importantly, the policy mood model disregards the role of inequality and relative income, such that whether actors are poor or rich, or risk becoming poorer or richer in the future, is irrelevant to their predicted level of support for liberal policies. In fact, based on the logic of the luxury goods argument, we would expect absolute and relative income shifts in the same direction to have the same effects on redistributive preferences.

Recent empirical work finds mixed evidence for the policy mood model. While some find evidence consistent with the argument (De Neve 2014; Kayser 2009), others find inconsistent results (Enns and Kellstedt 2008). Most recently, Ferguson, Kellstedt, and Linn (2013) extend Durr's (1993) empirical analysis by incorporating data until 2010, finding that the predictions of macroeconomic effects on policy mood do not hold well in the larger time series, as there is no clear pattern in recent decades. They explain these inconclusive results by emphasizing that different aspects of the economy vary in their salience across economic periods, while they propose that macroeconomic effects might be heterogeneous across different groups of the population.

We believe this is an important point that deserves emphasizing. The two broad literatures just discussed indicate that the predicted effects of a relative income shift on redistributive preferences are the opposite of the predicted effects from an absolute income shift. Both are assumed to

9. Importantly, expectations of future economic conditions, rather than reactions to past conditions, are central to the policy mood perspective. See, e.g., Durr (1993, 163).

10. To be clear, the policy mood literature has also emphasized the separate roles of inflation and unemployment, as opposed to general economic (or income) growth, on expectations of future economic conditions, based on a slightly different theoretical framework (Erikson, MacKuen, and Stimson 2002). We simplify the discussion by focusing on the "luxury goods" perspective instead.



shift expectations of future income, except that they differ as to whether such expectation will vary across individuals or not. In other words, whether or not individuals compare their (realized or expected) income gain or loss to others, as well as who those others are, might be critical for how it affects their desire for income redistribution. Such perceptions are rarely identified, as economic mobility and expected changes in individual income are generally measured through self-reported intergenerational mobility (Alesina and Giuliano 2011), unemployment risk (Rehm 2009), and expectations of financial and economic change for one's household and country (Anderson 2007), all of which fail to isolate relative and absolute expectations. Thus, it is possible that both perspectives are valid but that either income shifts will be more or less widely shared across time periods or different types of income shifts will be more or less salient across periods (e.g., Graham and Pettinato 2002; McCall 2013). This has the potential of explaining these conflicting results within a more general framework.

#### THE EFFECTS OF INCOME SHIFTS ON REDISTRIBUTIVE PREFERENCES

Our argument builds on recent work emphasizing the importance of group belongingness and social affinity in shaping redistributive preferences (Barth et al. 2015; Lupu and Pontusson 2011; Shayo 2009). We assume that individuals care about their own material self-interest but are averse to an inequitable allocation of income (Fehr and Schmidt 1999). Because such an aversion to inequality is fairly context-dependent (Fehr and Gintis 2007) and can be expected to vary with income and levels of inequality (Engel 2011), it is more likely to be affected by income shifts than the closely related concept of altruism, which is generally considered a more stable personality disposition, shaped in large part by genetics and pre-adult socialization (Batson 1998; Fehr and Fischbacher 2003). Furthermore, we contend that inequality aversion is strongly affected by social affinity, with a stronger affinity to others in society increasing individual disutility from an unequal distribution of income.

There is mounting research to support such a claim. Evidence shows that people are more likely to help members of their own group than members of other groups (Chen and Li 2009; Stürmer and Snyder 2009) and that such an effect is driven in part by a sense of belongingness to a common group, which is shaped by a feeling of common fate (Flippen et al. 1996). This forms the basis of the recent "social distance model" in political economy (Alt and Iversen 2016), where social affinity to others is shaped by shared experiences and perceptions of similarity and is positively associated with redistributive preferences (Lupu and Pontusson 2011). Put

bluntly, higher social affinity leads to more aversion to inequality within a social group.<sup>11</sup>

Such social affinity, however, is conditional on the desirability of group membership. Extensive work in social psychology has shown that when groups are permeable, individuals are more likely to distance themselves from less desirable groups, such as low-status or vulnerable groups (Ellemers, Spears, and Doosje 2002), and thus they exhibit a lower desire to help others in the group (Ellemers, Wilke, and Van Knippenberg, 1993). Conversely, more positively evaluated groups tend to produce a greater attachment and favoritism toward the group (Mullen, Brown, and Smith 1992). Similarly, the notion that people might instrumentally select their political or social identity has gained traction in political science. For example, scholars have modeled vote choice as a function of the voter's strategic calculation to identify with the ethnic groups that maximize their material or psychological well-being (Penn 2008; Posner 2004; Shayo 2009). The implications are the same: individuals try to select out of disadvantaged and inferior groups in favor of either higher-status groups or a more individualized identity.

But how specifically are such concerns affected by absolute and relative income shifts? During periods of positive absolute income shifts, when everyone seems to benefit equally, we argue that similarities across members of society will become more salient. Work in social psychology shows that such perception of a common fate results in stronger group identification, or a growing sense of "we-ness" (Dovidio, Gaertner, and Saguy 2009; Gaertner and Dovidio 2000). A positive absolute income shift will thus increase social affinity by enhancing the desirability and value of "we-ness" (Ellemers et al. 1993). However, negative absolute income shifts should have the opposite effect, reducing social affinity as people distance themselves from the rest of the group, given that the group is now less desirable, in order to avoid the loss of status and esteem.

In other words, after periods of positive absolute income shifts, people will feel like everyone is on the same boat, sharing equally in the gains of the economy. This also happens to be a desirable boat, one to which individuals want to belong. On the other hand, after periods of negative absolute income shifts, people may feel that everyone is on the same boat but that belonging to the boat is undesirable. This suggests that positive and negative absolute income shifts should

11. Note that for our purposes, and throughout the discussion below, we focus on the largest domestic group—that of the national population—for the sake of clarity. Future work should extend this framework to include the possibility of identifying with more than one group.

have opposite effects on social affinity, which in turn, should lead to opposite effects on redistributive preferences. More specifically, following a positive absolute income shift, redistributive preferences should uniformly increase, while redistributive preferences should uniformly decrease following a negative absolute income shift.<sup>12</sup>

In contrast, during periods of relative income shifts, the similarities between members of society will become less salient. These are periods of economic growth and recession when people seem to benefit or suffer unequally, thus providing a growing sense of competition, as shifts in relative rank are zero sum. Consequently, these are periods of lower group identification and greater social distance in society, which lowers the aversion to inequality, combined with shifts that increase citizens' expectations of becoming richer or poorer, meaning we would expect self-interest to dominate redistributive preferences under such contexts. The metaphor in these cases could be described as a situation where the small boats and the yachts are enjoying different breezes out at sea, to paraphrase Lagarde (2015). In such a setting, the POUM and PODM dynamics take center stage. In the former case, a positive relative income shift should uniformly lower redistributive preferences, while in the latter case, a negative relative income shift should uniformly lead to higher redistributive preferences.<sup>13</sup>

As should be evident, we conceptualize redistributive preferences as dynamic in nature, with expectations about the future shaping current preferences. This follows from both the policy mood and the political economy literatures dis-

cussed above, which assume that an important effect of economic cycles on preferences occurs by shifting expectations of future income (Durr 1993; Rehm et al. 2012). Given that redistributive preferences will be a function of expectations of future income, it is important to conceptually and empirically separate the effects of expectations about future income shifts from expectations altered due to pure uncertainty about the future. Assuming that there is a positive probability of experiencing an income shift and moving either up or down the income distribution, moving from a static to a dynamic scenario (meaning introducing uncertainty) should produce an increasing convergence (in proportion to the level of uncertainty introduced) in the redistributive preferences across income groups. Individuals with higher than average income today should prefer higher levels of redistribution for tomorrow, to insure against possible future income loss, while individuals below average income should prefer lower levels of redistribution, to allow for the possibility of future income gain. Our main argument is that the effects of expected income shifts on redistributive preferences will be above and beyond these pure uncertainty effects and that their effects will critically depend on whether they are relative or absolute in nature.

Formally, the above theory suggests that the utility of actor  $i$  from income and redistribution is determined by his/her subjective expectation of future market income  $\hat{x}_i$ , the chosen tax rate,  $\tau \in [0, 1]$ , the level of inequality in disposable income  $Q(x_n, \tau)$ , where  $Q$  is some measure of disposable income inequality (which depends on the distribution of market income in society,  $x_n$ , and the chosen tax rate), and his/her aversion to inequality  $\delta_i(\rho_i)$  (which depends on her social affinity,  $\rho_i$ ).<sup>14</sup> We assume that actors can vote for a proportional tax rate, which is collectively chosen through simple majority voting (where each actor votes his/her most preferred tax rate), with tax revenues generating a lump-sum payment to each citizen, thus serving a redistributive function. In order to ensure a balanced budget, this payment is defined to be  $T = \tau\bar{x}$ , where  $\bar{x}$  is the average income in so-

12. Note that the theory specifically concerns absolute income shifts, rather than absolute income levels. As such, our theory does not make explicit predictions as to whether citizens of richer countries should be more egalitarian than citizens of poorer countries. We assume that people anchor on changes over time, meaning that income shifts from  $t$  to  $t + 1$  are what affects redistributive preferences, rather than income levels per se.

13. It should be noted that our discussion concerns pure income effects, at the individual level, in order to provide conceptual and theoretical clarity. Absolute and relative income shifts, as described here, are best thought of as ideal types, as individuals are likely to experience both shifts at once to varying degrees. Importantly, a relative income shift affects both absolute income and relative rank in society, meaning that the only difference between an absolute income shift and a relative income shift in the same direction is the change to relative rank. It is this change that often remains unmeasured in survey data, yet which, we argue, sends a strong signal to individuals of being either in a state of shared shifts, or one of competition and individual income maximization. Empirically, most income shifts will also affect inequality itself, as some people experience rank-preserving absolute income shifts and others relative income shifts, which, on aggregate, affects the income distribution in society. As we focus on individual preferences, the logical first step is to isolate the implication of the main income shifts on individuals experience, while leaving a broader development of the possible aggregations of income shifts (and their effects) to future work.

14. Clearly, inequality aversion is affected by a host of other factors, which we exclude from the model since they are not affected by absolute or relative income shifts. Note that while we leave the functional form of disposable income inequality unspecified, we acknowledge that at extreme levels of equality or inequality, aspects of our theoretical mechanism might be attenuated, in part given how such extreme conditions affect social affinity and expectations of mobility. Further assumptions would have to be made to make specific predictions about the effects of different levels of inequality on redistributive preferences, for example, how levels and types of inequality relate to expectations of mobility, as well as how social affinity varies with changes in inequality). Since the level of inequality is not our primary concern (indeed, it is deliberately kept fixed in the empirical analysis), we leave this for future work.

ciety.<sup>15</sup> Citizens are assumed to be risk neutral,<sup>16</sup> and they only look one period into the future when they vote for a binding tax policy, before earning their future income. Then, the utility of actor  $i \in (1, \dots, n)$  is given by:

$$U_i(x) = [(1 - \tau)\hat{x}_i + \tau\bar{x}] - [\delta_i(\rho_i) \times Q(x_n, \tau)]. \quad (1)$$

The term in the first bracket captures the disposable income of actor  $i$ , while the term in the second bracket captures the effect of inequality aversion, which is determined by social affinity and the level of disposable income inequality.<sup>17</sup> Following Shayo (2009), we define social affinity,  $\rho_i$ , as monotonically decreasing with the perceived distance between  $i$  and the “prototypical” (or “average”) member of society and monotonically increasing with the “value” of being a member of society, based in particular on the notion that individuals derive greater utility when society is more affluent. Note that  $\rho_i$  serves as a weight for the disutility of income inequality, by shaping  $\delta_i$ , and that we treat it as a contextually defined exogenous outcome,<sup>18</sup> which is consistent with extant psycho-

logical perspectives (Mullen et al. 1992) and which provides a more parsimonious basic model from which to build on.<sup>19</sup>

Given the utility function above, each citizen’s preferred tax rate will be a corner solution, as their utility is linear in  $\tau$ . Consequently,  $i$ ’s preferred tax rate, given his/her social affinity and existing disposable income inequality, is  $\tau = 0$  if he/she expects to be sufficiently rich,

$$\hat{x}_i - [\delta_i(\rho_i) \times Q(x_n, \tau)] > \bar{x}, \quad (2)$$

or  $\tau = 1$  if he/she expects to be sufficiently poor,<sup>20</sup>

$$\hat{x}_i - [\delta_i(\rho_i) \times Q(x_n, \tau)] \leq \bar{x}. \quad (3)$$

As in Esarey et al. (2012), inequality aversion can thus be thought of as a penalty that varies for each individual, depending on their social affinity, and that increases the expected income needed for a citizen to vote against redistribution. In other words, it increases the expected income threshold from  $\bar{x}$  to  $\bar{x} + [\delta_i(\rho_i) \times Q(x_n, \tau)]$ , above which citizens vote against redistribution.<sup>21</sup>

With this basic model in mind, we can illustrate our hypotheses more formally. Following absolute income shifts, social affinity changes, increasing with a positive absolute income shift and decreasing with a negative absolute income shift. Since absolute income shifts do not change the distribution of disposable income, expectations of future relative income remain unchanged. Formally, positive absolute income shifts result in  $\Delta\hat{x}_i/\Delta\bar{x} = \hat{x}_i/\bar{x}$ ,  $\Delta Q = 0$ , and  $\Delta\rho_i > 0$ , while negative absolute income shifts only differ in that  $\Delta\rho_i < 0$ , as we assume the common fate effect is overwhelmed by the undesirability of identifying with the now lower status, and

15. For simplicity, we assume that there are no inefficiencies associated with taxation and that individuals do not choose levels of labor endogenously. These are fairly standard simplifying assumptions, and they do not affect the basic intuition of the model (e.g., Alt and Iversen 2016; Minozzi 2013).

16. Importantly, our results are not dependent on this assumption, as we do not assume rational expectations but instead treat expectations as exogenous beliefs, as discussed below. In standard steady state equilibrium (e.g., Alt and Iversen 2016), these expectations will match objective expectations of mobility, although such an assumption is not necessary for a POUM or PODM equilibrium to result, as recent work shows (Minozzi 2013). It is also not necessary to assume risk-averse citizens, as long as the expectations of future income are allowed to vary from objective expectations. If, however, we assume that citizens are risk averse (such as through a log utility function, where the relative risk aversion is equal to 1), the proportion of citizens preferring  $\tau = 1$  would increase, which is equivalent to saying that redistributive preferences increase. This follows from the definition of risk averseness (concavity of the utility function). Note that without auxiliary assumptions about economic mobility and taxes, such an extension is still compatible with both a POUM or PODM dynamic. For example, an RRA of 1 is assumed in both Alt and Iversen (2016) and Bénabou and Ok (2001), important models of POUM and PODM, respectively.

17. The model is inspired by, and similar in spirit to, Fehr and Schmidt’s (1999) well-known formalization of social preferences. Unlike Fehr and Schmidt, we do not consider the potential that the effect of “advantageous” inequality differs from the effect of “disadvantageous” inequality. Furthermore, Fehr and Schmidt do not consider the potential for redistribution through taxation or the effects of expectations of future income on preferences.

18. To be clear, following the psychological literature, we treat identification with others as an automatic cognitive reaction, not as a conscious deliberate action. Consequently, identification and social affinity are exogenous in our model, although they are determined by contextual

factors, such as group status or perceptions of social proximity and commonality. While this might not explain all social identification, it is consistent with the simple observation that identifying with less desirable groups in society remains a very common occurrence.

19. Note that while we argue that absolute income shifts affect social affinity, we do not concern ourselves with the possibility of social affinity, in turn, affecting expectations of income shifts. There is growing empirical evidence to support such an endogenous relationship (e.g., Alt and Iversen 2016; Finseraas 2012), but, for simplicity, we treat expectations of mobility (i.e.,  $\hat{x}_i$ ) as exogenous in this article (both theoretically and empirically).

20. Assuming citizens choose  $\tau = 1$  when indifferent.

21. As we present the model for heuristic purposes, to demonstrate how inequality aversion, in a basic sense, enters the utility function of individuals and affects redistributive preferences, we are not necessarily concerned with the median voter or accounting for different types of insurance or mobility dynamics. The model is clearly incomplete and inadequate to explain certain important redistribution dynamics. Our more limited goal is to provide a behavioral political economy model to parsimoniously demonstrate the effect of income shifts on redistributive preferences.

thus less desirable, group. Thus, positive absolute income shifts increase the threshold for voting against redistribution (such that redistributive preferences increase), while negative absolute income shifts decrease the threshold (with redistributive preferences also decreasing). This gives inequality aversion the character of a normal good, given that it only increases after a positive absolute income shift.

Meanwhile, relative income shifts leave inequality and average income unchanged,  $\Delta Q = 0$  and  $\Delta \bar{x} = 0$ , while reducing social affinity,  $\Delta \rho_i < 0$ . Positive shifts naturally increase expectations of future relative income,  $\Delta \hat{x}_i > 0$ , whereas negative shifts decrease such expectations,  $\Delta \hat{x}_i < 0$ . Thus, after a positive relative income shift, as individuals expect to become relatively better off (POUM), redistributive preferences decrease, while negative relative income shifts (PODM) lead to increases in redistributive preferences.<sup>22</sup> In other words, absolute income shifts affect redistributive preferences by altering inequality aversion, while relative income shifts mostly matter by altering expected future relative income.

In short, we are left with the following hypotheses, which our experiment seeks to evaluate:

**H1. Uncertainty effect:** Moving from a static to a dynamic environment should increase (decrease) redistributive preferences for those above (below) mean income.

**H2. Positive absolute income shift (Upturn):** Higher expected absolute income should increase redistributive preferences.

**H3. Negative absolute income shift (Downturn):** Lower expected absolute income should decrease redistributive preferences.

**H4. Positive relative income shift (POUM):** Higher expected relative income should decrease redistributive preferences.

**H5. Negative relative income shift (PODM):** Lower expected relative income should increase redistributive preferences.

Critically, we expect opposite effects from absolute and relative income shifts in the same direction. To the extent that

22. Note that we assume that  $|\partial U / \partial \rho_i| < |\partial U / \partial \hat{x}_i|$ , that is, that the effect of changes in income,  $\hat{x}_i$ , dominate the effect of changes in social affinity,  $\rho_i$ , which is consistent with the strong income slope generally found in the literature.

the empirical results line up with our predictions, our theory improves upon existing perspectives, which can only explain the effects of relative income shifts or absolute income shifts on redistributive preferences but not both types of income shifts.

## RESEARCH DESIGN

We employ an experimental design in order to provide clear evidence of the theorized effects of absolute and relative income shifts. By using an experimental design, we are able to control for a variety of factors that are difficult to capture within an observational framework, while at the same time we can finely manipulate the absolute and relative incomes of subjects and directly observe the effects on redistributive preferences. The latter aspect is especially important to maximize internal validity and thus provide strong evidence for or against our theory.

There have been several different experiments specifically testing redistributive preferences in the tradition of the Meltzer-Richard model. Cabrales, Nagel, and Mora (2012) and Klor and Shayo (2010) both find clear evidence that tax votes (a measure of redistributive preferences) mostly follow a self-interested pattern. However, these studies focus on static perfect information decisions and only allow subjects to choose between two tax rates. A more general and theoretically consistent framework would allow subjects to vote on any tax level, with the median proposal selected, and take into account expectations of future income, as we do here.

Three recent experiments take into account the dynamic nature of redistribution. Both Barber et al. (2013) and Durante, Putterman, and van der Weele (2014) make subjects vote on a tax before performing a real-effort task. The former find that as the risk of income loss increases, the tax vote increases, while the latter find a positive relationship between risk aversion and the tax vote under uncertainty. Although these results are important, a stronger result would elicit tax preferences after subjects have earned their income through a real-effort task yet have the tax be effective in future rounds as well. Esarey et al. (2012) implement such a design, presenting results that are consistent with the findings above. In designing our experiment, we build on these important studies, while at the same time we improve upon them, as we detail below.

## THE “REDISTRIBUTION GAME”

We designed the “redistribution game,” using zTree (Fischbacher 2007), with each experimental game proceeding in the following manner. In each session, 10 subjects were seated in front of computers. Each round of the game followed the same design, with subjects randomly (and anonymously) split into two groups of five players at the beginning of each round



so as to reduce reputational and learning effects as the experiment progressed. Each round consisted of subjects performing a task, receiving information about the possibility of future income shifts (our experimental manipulation), voting on a tax rate, and then performing the same task again, with the vote choice applying to subjects' earnings from both tasks. This same task → information → vote → task sequence was carried out over 10 rounds (the *Static* condition was slightly different, as explained below).<sup>23</sup>

The task subjects engaged in was a "slider task," with subjects seeing 48 "slider bars" on the screen and having 30 seconds to drag as many bars as possible to the middle of each slider, earning a point (in the default) every time they successfully dragged a bar to exactly the middle of the slider. The slider task was chosen as a real-effort task, as it is designed to be an effortful task that varies between highly and poorly motivated individuals (Gill and Prowse 2012). This ensured that subjects' payoffs seem as earned and deserving as possible, thus minimizing fairness concerns and making this a "hard test" for any other-regarding preferences, given the incentivized nature of the game. Subjects were ranked, within each group, after each task, based on their points earned, with payoffs assigned based on rank. They were then presented with their results, group rank, and payoff. Importantly, pre-tax earnings were fixed such that subjects actually competed for a higher rank. This was done to ensure that the level of pre-transfer inequality was constant across all conditions in order to control for any confounding effect from changes to inequality.<sup>24</sup>

After performing the task and being informed about their performance, subjects received one out of six possible between-subject experimental information manipulations.<sup>25</sup> In the *Control* condition, subjects were prompted that for the second task of that round, they would continue to earn one point for each correct slider movement (the default from the first task) and the possible payoffs would remain the same, \$10, \$6, \$4, \$3, and \$2.<sup>26</sup> Basically, they were told

that the second stage would be identical to the first stage. In the *Upturn* condition, subjects were told that the points earned would remain the same, though they were now informed of a 70% probability that the possible payoffs for the second task would increase to \$15, \$8, \$6, \$4.5, and \$3. In the *Downturn* condition, conversely, they were provided the same information, except that the possible payoffs in the second task were now \$5, \$3, \$2, \$1.5, and \$1. These are inequality-preserving payoff shifts that should only affect the expectations of future absolute income, not future relative income.

In the *POUM* and *PODM* conditions, half of the subjects were randomly chosen and informed that the possible payoffs for the second task would remain the same for the other half of the subjects, while they would earn 2 points and 0.5 points, respectively, for each correct slider movement in the subsequent task. Thus, they were informed that they would experience *POUM* or *PODM*, respectively, in each round. The other half of the subjects (those not experiencing *POUM* or *PODM*) received the same prompt as the subjects in the *Control* condition for the entire game.<sup>27</sup> This manipulation is analogous to the conceptualization of economic mobility in the literature as one of a shift in individual's productivity levels.

After receiving the information prompt, subjects voted on a lump sum flat tax and engaged in the task a second time, with the selected tax applied to the payoffs of both tasks. Such a design captures the relevant expected mobility models, where actors vote on a tax that is "sticky" (i.e., applies to current and future income). This feature of the design is meant to capture the dynamic in the real world, where people weight their current income with their expected future income when considering the costs and benefits of social policies and taxation.

One of the conditions, the *Static* condition, was slightly different from the previous conditions. Rather than following the task → information → vote → task sequence, the subjects voted on a tax rate immediately after engaging in the

23. See the appendix for a detailed description of the experimental manipulations, survey questions, the handout presented and read to subjects, manipulation checks, and screenshots of the program.

24. This is critical, as inequality aversion is expected to vary with the level of inequality. Note that our simple model is unable to provide clear predictions about the effect of changes in inequality without further assumptions about the underlying context. As the purpose of this article is to demonstrate the pure income effects and provide conceptual clarity, we fix the level of pre-tax inequality and do not consider the conditional effects of different types of inequality patterns.

25. The treatment was the same across rounds within each experimental session, as these are between-subject manipulations.

26. This is a slightly right-skewed income distribution (Gini coefficient of 30.4), thus it resembles real-world income distributions. A quick

glance at OECD data shows that such a level of inequality is approximately equivalent to that in Ireland in 2012, and, in fact, is very close to the OECD average that same year (OECD 2014).

27. Since this is a between-subjects design, subjects always received the *POUM/PODM* prompt or the *Control* prompt. Because they were not informed that the other half of the subjects were experiencing *POUM* or *PODM*, we classify those who received the *Control* message with the subjects from the *Control* condition in our primary analysis. As pointed out by an anonymous reviewer, it might be the case that these subjects did not behave as the "true" controls, since they interacted with subjects who were experiencing *POUM* or *PODM*. In the supporting information, we report our main results with these potentially "impure" subjects excluded. The results are substantively unchanged.

first task and without the prospect of another task in the same round. Thus, subjects played the game without uncertainty, voting on a tax already knowing their rank. There are two critical benefits to measuring such a baseline condition. First, we are able to replicate the findings in the literature regarding the existence of both self-interest and inequality aversion in static redistribution experiments (Klor and Shayo 2010). Second, it allows us to separate, within the same design and sampling frame, the effect of uncertainty and expectations of future income in redistributive preferences, as measured through the difference in subjects' selected tax in the Control condition (two periods with no income shift) and the Static condition (one period only). Moreover, we are able to replicate the findings in the literature regarding the positive association between uncertainty and risk with redistribution preferences (Barber et al. 2013; Esarey et al. 2012). This gives us greater confidence in the validity of our design and sample.

In order to ensure complete information on the voting itself, subjects selected the tax rate (our measure of revealed redistributive preferences) observing the potential earnings of each rank if their suggested tax rate was implemented. Importantly, after the second task was completed in the experimental conditions including two tasks per round, subjects were not told their relative rank or the chosen tax rate, in order to minimize reputational and learning effects (such as social desirability or norms of reciprocity). At the end of the experiment, the median tax rate selected in each group was applied to the earnings of each subject for that round, and subjects were paid their post-tax earnings from one randomly selected round and task. As such, this is a fully incentivized tax vote, meaning that our measure of redistributive preferences has real consequences for subjects' ultimate monetary payoffs for their participation.

In sum, the new redistribution game improves on previous designs in several ways. It controls for confounders such as reciprocity, social desirability, deservingness, and fairness norms, while it provides a more realistic and theoretically faithful operationalization of the dynamic aspect of redistribution. It also provides a fully informed tax vote and controls for levels of pre-transfer inequality; thus, it isolates the effects of shifts in absolute and relative income. This new design, we argue, provides a useful framework for studies on the effects of income shifts on redistribution and could serve as the basis for future extensions in this literature.

The full experiment was conducted during the months of November 2013, February 2014, and April 2014, in an experimental lab at a US university. Subjects were recruited from a department-wide voluntary subjects pool. While we recruited only college students for the experiment, we lack any theoretical basis to suspect treatment effects to only oc-

cur among younger or more educated populations. Subjects played the game and answered a short survey, lasting about 20–25 minutes, for extra credit, a \$5 show-up fee, and their earnings from the game. Each session was conducted with 10 subjects, with a total of 20 sessions held, for a combined total of 200 subjects. During each session, subjects played 10 rounds in one of six treatment conditions. This resulted in 10 observations per subject, for a total of 2,000 observations.

## RESULTS

We analyze the results of the experiment using nonparametric and mixed effects regression methods (Gelman and Hill 2007; Keele, McConnaughy, and White 2012). The former allows us to analyze the data using minimal assumptions about the data-generating process, while the latter allows us to account for the nested structure of the data in our analysis. When using nonparametric methods, we aggregate the data up to the subject level, such that the 10 observations available for each subject are aggregated into one average score per subject. However, in the second part of the analysis, we analyze the data at the observation level, such that each subject contributes 10 observations (one for each round), using mixed effects models to account for possible within subject correlations. The appendix, available online, provides an overview of tax rate choices in each of the treatment conditions, as well as an analysis of rankings and tax rate choices by subject across the 10 rounds. The latter is useful in determining the extent to which subjects rank consistently across rounds and the within-subject effects of changes in rank on tax rate vote. The appendix also includes manipulation checks, confirming the validity of our treatments, and descriptive statistics for all the variables.

## NONPARAMETRIC ANALYSIS

Are differences across treatments statistically significant? A Kruskal-Wallis test suggests that the distribution of tax rates differs across the six conditions ( $\chi^2 = 32, p < .01$ ). Pairwise comparisons between each treatment with the Control condition are shown in table 1.

### **Conclusion 1: An expected increase (decrease) in relative income decreases (increases) redistributive preferences, on average.**

As predicted by hypotheses 4 and 5, changes in relative income have an opposite effect on redistributive preferences. When subjects experience the “prospect of upward mobility,” where a subset of players (themselves included) receive a boost to their expected monetary earnings, they become less willing to vote for higher taxes, presumably so that they pay less in the next period if their rank increases. However,

Table 1. Nonparametric Tests

Treatment	N	Hodges-Lehmann Estimate	Mann-Whitney U <i>p</i> -Value
Control	70		
Static	30	.6	.446
Upturn	30	9.2	.017
POUM	20	-11.0	.006
Downturn	30	-4.2	.066
PODM	20	11.4	.001

Note. All estimates and *p*-values are based on separate comparisons between each respective treatment condition and the Control condition. The Hodges-Lehmann estimate is for the differences between medians, and the Mann-Whitney U test is a rank-based nonparametric test for the null hypothesis that both groups come from the same population. The *p*-values shown are based on one-sided alternative hypotheses.

when subjects experience the “prospect of downward mobility,” where a subset of players (themselves included) receive a blow to their expected monetary earnings, they become more willing to vote for higher taxes, presumably so that they gain more in the next period if their rank decreases. This is clear evidence for the self-interested effect of relative income shifts on redistributive preferences. The results are symmetrical across the Control condition, with the POUM (PODM) condition leading to a 11% point decrease (increase) in desired tax rates, on average.

**Conclusion 2: An expected increase (decrease) in absolute income increases (decreases) redistributive preferences, on average.**

As predicted by hypotheses 2 and 3, increases in absolute income also have an opposite effect from decreases in absolute income. When subjects experience the prospect of an upturn, where all players have a positive probability of receiving a boost to their expected monetary earnings, they become more willing to vote for higher taxes and reduce inequality, even at a cost to themselves, consistent with the argument that inequality aversion depends on a common fate. When subjects instead experience the prospect of a downturn, where all players have a positive probability of receiving a blow to their expected monetary earnings, they become less willing to vote for higher taxes, and, by implication, they are less concerned with inequality, consistent with the moderating effect of group status on inequality aversion. Importantly, while the results for the Upturn condition are similar in strength to the effects of the POUM and PODM conditions, leading to a 9% point increase in desired tax rates, the results for the Downturn condition are considerably weaker, and they are only statistically significant at the 10% level.

**Conclusion 3: Relative and absolute income changes have an opposite effects on redistributive preferences.**

Taken together, conclusions 1 and 2 support the paradoxical juxtaposition of the underlying hypotheses. On the one hand, experiencing the “prospect of upward mobility” has an opposite effect to experiencing an upturn, while on the other hand, experiencing the “prospect of downward mobility” also has an opposite effect to experiencing a downturn. Existing theories of the effects of income changes on redistributive preferences cannot account for this pattern, with the results in this article supportive of the conclusion.

A relevant concern is whether the results are driven by the well-known dynamics of prospect theory (Kahneman and Tversky 1979). We do not find any difference across the experimental conditions in subjects’ risk preferences ( $\chi^2 = 1.7$ ,  $p = .89$ ), which indicates that our results are not driven by such a mechanism. This alternative explanation is also less probable as the economic shifts in the game are expectations of future income, not actualized gains or losses. Such a situation should be less likely to induce feelings of domains of gains and losses, which are characterized by the significant cognitive influence of the reference point of potentially losing one’s realized gains or recovering one’s realized losses.

**REGRESSION ANALYSIS**

There are three primary weaknesses with the previous analysis. First, since the data are aggregated up to the subject level, a considerable amount of variation in the data is discarded. This may contribute to the statistically weak results found for the Downturn condition. Second, since the sample size of each treatment condition is somewhat limited, it might be the case that there are actual differences between the finite samples that are unrelated to the treatment conditions. Third, the previous analysis does not allow for treatment effect heterogeneity, such as the possibility that the treatments might have differential effects across ranks, which needs to be analyzed in order to properly evaluate hypothesis 1. To strengthen the analysis, we report the results of linear mixed effects models, which include random effects at the subject level. This allows us to analyze the data at the observation level instead of the subject-level, while it also accounts for possible within-subject correlations in tax rate choice.<sup>28</sup>

Table 2 reports the main results of the mixed effects analysis. Model 1 only includes the treatment indicators and is

28. For robustness, we also ran each regression models with random effects for each of the sessions to account for the possibility that there might be idiosyncratic differences across the 20 experimental sessions. The results, reported in the appendix, were unchanged.

Table 2. Mixed Effects Models

	Model 1	Model 2	Model 3
Constant	40.47* (1.89)	44.39* (1.83)	52.80* (3.80)
Static	.16 (3.45)	.40 (2.90)	-1.29 (2.99)
Upturn	9.55* (3.45)	9.79* (2.90)	8.88* (3.01)
POUM	-11.38* (4.01)	-10.30* (3.37)	-10.58* (3.37)
Downturn	-5.99 (3.45)	-5.75* (2.90)	-6.19* (2.93)
PODM	11.55* (4.01)	11.81* (3.37)	10.10* (3.51)
Rank 1		-27.76* (1.48)	-26.79* (1.53)
Rank 2		-20.39* (1.44)	-19.67* (1.47)
Rank 4		7.47* (1.44)	7.85* (1.46)
Rank 5		19.85* (1.52)	20.15* (1.54)
Female			-3.01 (1.95)
Family income			-.90* (.43)
Republican			-1.76 (1.02)
Conservatism			.69 (1.12)
BIC	18,808.89	17,907.95	16,921.44
Observations	2,000	2,000	1,890
Subjects	200	200	189
Subject variance	189.30	138.97	131.30
Residual variance	607.62	378.76	375.42

Note. The Control condition is omitted from the model, meaning the coefficients for each treatment can be interpreted with respect to the Control condition. Kenward and Roger (1997) approximation for degrees of freedom is used for hypothesis tests. Standard errors are in parentheses.

\*  $p < .05$ .

primarily reported to confirm that the results of the mixed effects analysis line up with the nonparametric analysis. In model 2, indicator variables for the ranking from the first task have been added, with the third rank serving as the reference category. Finally, model 3 includes measures for gender, family income, party identification (7-point scale, higher values correspond with being more Republican), and ideology (7-point scale, higher values correspond with being more conservative). Figure 1 shows the results from model 3.

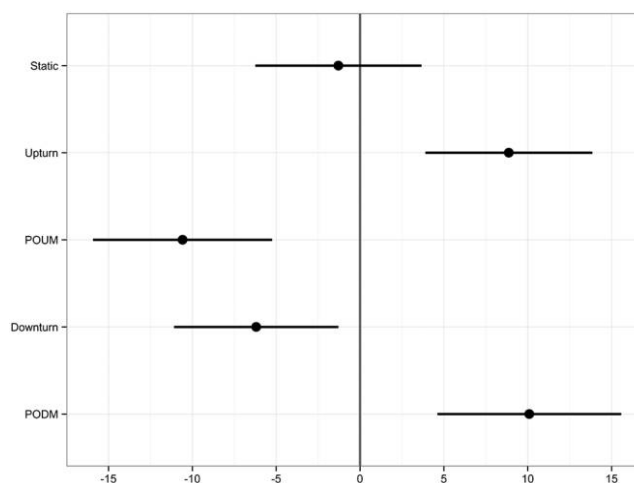


Figure 1. Treatment effects on tax choice: results from model 3. Point estimates and 95% confidence intervals are shown.

In all three models, the size of the treatment effects remain substantively and statistically similar to the nonparametric analysis. The additional variables added in model 3 provide some added explanatory power, although overall their effects are weak. A higher level of family income results in a lower tax vote, and being more Republican and/or Conservative is jointly associated with voting for less redistribution. Clearly, these effects are weaker than most of the treatment effects, and they pale in comparison to the laboratory income effects shown in models 2 and 3, with those ranked at the top voting, on average, for a 27% point lower tax, compared to the median rank, and those at the bottom voting, on average, voting for a 20% point higher tax. More important, the laboratory income and treatment effects holds even after controlling for subjects' political ideology and family income.<sup>29</sup>

### Do treatment effects differ across ranks?

As expected, the tax rate chosen by subjects differs considerably across rankings from the first task. On average, subjects in the top rank (Rank 1), voted for a 12.5% tax, while subjects in the bottom rank (Rank 5) voted for a 65% tax. The average tax rate preferred by the median rank (Rank 3) was 46%. Self-interest clearly mattered a great deal to subjects across conditions, consistent with the findings above and supportive of the “hard case” that this represents for other-regarding preferences, given the real-effort task and monetary payoffs.

Considering the strength of the ranking effects, it is of interest to analyze the results separately for ranks. Table 3

29. Including an egalitarianism scale, based on a factor analysis of five questions about egalitarian values, did not alter the results, while the scale remained insignificant.



Table 3. Mixed Effects Models, by Rank

	Ranks 1 and 2	Rank 3	Ranks 4 and 5
Constant	20.73* (1.73)	44.71* (2.25)	55.88* (2.34)
Static	-10.21* (3.02)	-6.64 (4.13)	15.66* (4.13)
Upturn	16.30* (3.13)	17.66* (4.15)	1.79 (4.28)
POUM	-9.08* (3.73)	-11.07* (4.89)	-10.56* (5.05)
Downturn	-4.96 (3.07)	-6.60 (4.16)	-1.74 (4.27)
PODM	18.92* (3.67)	14.98* (4.72)	4.76 (4.89)
BIC	6,744.38	3,622.56	7,378.20
Observations	800	400	800
Subjects	181	172	179
Subject variance	126.97	129.42	211.69
Residual variance	195.29	378.58	455.87

Note. The Control condition is omitted from the model, meaning the coefficients for each treatment can be interpreted with respect to the Control condition. Kenward and Roger (1997) approximation for degrees of freedom is used for hypothesis tests. Standard errors are in parentheses. \*  $p < .05$ .

shows the results for the rank-based analysis across conditions, with ranks 1 and 2 grouped together and Ranks 4 and 5 grouped together. Since the original sample consists of 2,000 observations, each of the rank conditions consists of 400 observations. However, since not all subjects experience all ranks (e.g., some subjects consistently ranked first or second across periods), the number of subjects in each of the models differs.

**Conclusion 4: The effects of the Static treatment is highly conditional on the ranking from the effort task.**

Subjects that rank first or second in the Static condition vote for a considerably lower tax than subjects with the same rank in the Control condition. The reverse holds true for Ranks 4 and 5. This suggests that the added uncertainty of the second task effort introduced in the Control condition does indeed play a role, although it is masked when analyzing all ranks collectively. Put simply, the certainty of income rank in the Static condition leads to redistributive demands more directly based on current income, while the uncertainty of income rank in the Control condition reduces the effects of income on preferences. This replicates the positive association found in the literature between risk of income loss with redistributive preferences (Esarey et al. 2012). It also strongly

supports hypothesis 1 and highlights the importance of properly accounting for the dynamic nature of redistributive preferences. Figure 2 further illustrates the conditional nature of the relationship, underlining the strength of the uncertainty effect.

**Conclusion 5: The results for the Upturn condition are entirely driven by the first three ranks.**

For Ranks 1, 2, and 3, a shift from the Control to the Upturn condition leads, on average, to a 17% point increase in tax vote, while there is no such effect for ranks 4 and 5 detected. For the “rich” in the game, an expected increase in absolute income seems to trigger a greater desire for equality, as subjects were more willing to sacrifice their own earnings for others. The difference in treatment effects across ranks is not consistent with our expectation, nor is the null effect among the lowest two ranks. One possibility is that the expected absolute income gain was not large enough for the bottom ranks to trigger the feeling of “we-ness” and similarity that would induce a greater concern for inequality within the group. Another possibility is that these ranks experienced a ceiling effect, in that the bottom two ranks already supported such a high level of redistribution that growing inequality aversion was not able to significantly increase the tax vote.

**Conclusion 6: The results for the Downturn condition are insignificant for all ranks.**

Given that we expected a decrease in redistributive preferences following the Downturn condition, these null results are surprising. However, it is possible that our sample was not large enough to reliably detect significant differences

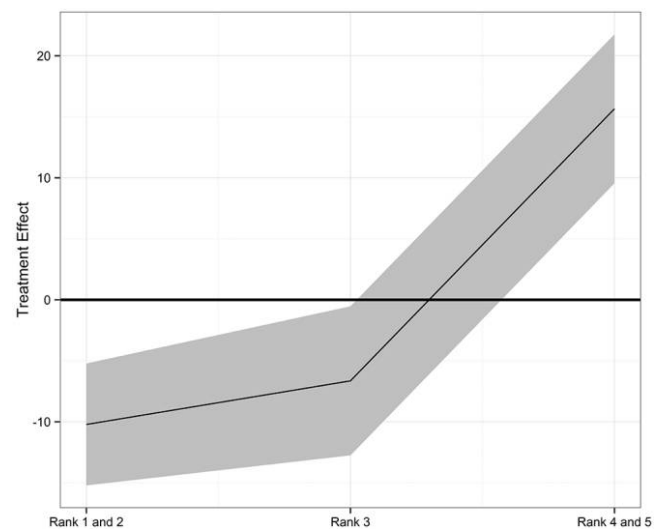


Figure 2. Effects of the Static condition on tax choice by rank. Point estimates and 95% confidence intervals from models in table 3 are shown.

when analyzing by subgroups, as the overall treatment effect was significant. As just mentioned, it is also possible that the treatments were simply too weak for the lowest ranks, although this still fails to explain why the top ranks no longer exhibited significant differences from the Control.

As we are unable to convincingly explain these patterns with our data, future studies should replicate this finding while seeking to separate the different potential mechanisms at work. More important, given that effects are clearly more pronounced after positive absolute income shifts, which is when we expected inequality aversion to exert the greatest effect, our finding highlights the potential problem of focusing mostly on economic recessions when studying the effects of macroeconomic cycles on preferences and behavior. Other-regarding preferences, here in the form of inequality aversion, are clearly more pronounced after absolute income growth, which, paradoxically, is precisely when others are less in need of collective support.

### **Conclusion 7: The results for the POUM and PODM conditions are consistent across all ranks.**

The results for the POUM and PODM conditions also exhibit the strongest treatment effects among Ranks 1–3, highlighting the strength of self-interested, income-based considerations on redistributive preferences. Expecting to be relatively better off in the future leads to less concern with helping others, which is striking given the strong effect on inequality aversion of expecting to be absolutely better off. The same applies in the opposite scenario of expecting downward relative shifts. Clearly, relative income shifts trigger more self-interested motivation than absolute income shifts.

Overall, the results of the experiment are mostly in line with the theory proposed in this article, with competing theoretical accounts failing to explain all results simultaneously. Thus, while the political economy literature can account for the relative income effects of the POUM and PODM conditions, it does not offer an explanation for the absolute income effects seen in the Upturn and Downturn conditions. Conversely, while the policy mood literature can account for the absolute income effects of the Upturn and, to a lesser extent, Downturn conditions, it fails to predict relative income effects on redistributive preferences. In short, previously advanced theories cannot explain why income shifts have the opposite effects on individual preferences depending on whether others also experience the income shift or not.

## **CONCLUSION**

The broader literatures on the effects of economic mobility and macroeconomic cycles on redistributive preferences re-

main at odds. We believe that conflicting theoretical predictions and empirical evidence on the relationship between economic cycles and redistributive preferences can be explained through a common framework to explain the effect of income shifts on preferences. People's relative income shapes their preference for redistribution. However, people also have a tendency to prefer greater equality, in particular when social affinity is high. The story remains incomplete if either one of these perspectives is neglected.

We argue that different types of income shifts have the potential of triggering these different dynamics. By their very nature, income shifts that are perceived to vary across individuals will highlight the social distance in society, while income shifts that are perceived the same across individuals will increase the feeling of social affinity with other members of society. Such feelings of group belongingness will increase concerns with inequality, resulting in individuals supporting greater redistribution, even at a cost to themselves, conditional on the status of the group. Positive income shifts enhance the attractiveness of the group, while negative income shifts lead people to disassociate themselves from the group, if possible. Using an improved experimental design, we tested this argument and found results consistent with these predictions.

In combining the policy mood and political economy literatures, we emphasize a behavioral political economy perspective (e.g., Minozzi 2013). There is growing evidence of the importance of other-regarding preferences in social behavior, and thus it is incumbent on us to no longer treat such behavior as “an unpredictable ‘social noise’ to be randomly sprinkled over individuals” (Alesina and Giuliano 2011, 94) but instead systematically incorporate it into our models of political behavior. In our model, we focus on inequality aversion and social affinity, which we believe are especially critical when deciding on how to redistribute income in society, though this is clearly not an exhaustive list.

At the same time, we do not disregard the central role played by self-interest in shaping redistributive preferences. Concern for fellow group members and individual self-interest are both inherent and fundamental human motivations. However, as demonstrated above, each underlying motivation becomes more pronounced under different contextual triggers, and depending on to whom people compare their economic gains and losses, such as after relative or absolute income shifts. Such a contextual and conditional understanding is necessary in explaining cross-national and temporal variation in other-regarding preferences (e.g., Fehr and Gintis 2007). This article overlooks much of this contextual dynamic, out of necessity, but further work needs to evaluate how social affinity and expectations of mobility

interact in a dynamic fashion as inequality changes under various scenarios of group diversity and status.

The experimental results presented in this article should be considered a first step—a proof of concept—in separating the effects of pure absolute and relative income shifts on redistributive preferences. While the results have high internal validity, their applicability outside the laboratory is uncertain. Clearly an important next step is to establish whether the same dynamics are at work using observational data. Since the real world is mostly characterized by a mixture of absolute and relative income shifts—sometimes even in opposite directions—separating these distinct concepts in the “wild,” while difficult, might help explain important puzzles about individual heterogeneity. Such an endeavor might require using proxies, or developing new measures, for perceptions of absolute and relative income shifts, attempting to objectively estimate how widely shared economic gains or losses are perceived to be across the public during macroeconomic cycles, and demonstrating the effects on social affinity and the moderating effect of positive and negative income shifts.

It is incumbent upon researchers to heed this plea to take seriously the crucial difference between absolute and relative income shifts, both theoretically and empirically. Ideally, greater attention should be given to the specific reference points that people use when forming opinions and perceptions on economic change. something we have shown should matter a great deal for policy preferences. More generally, the implication of our findings is that the effects of different types of economic cycles on public opinion cannot be fully understood without considering how they affect social affinity to other members of society and thus affect inequality aversion. Consequently, greater empirical attention should be given to perceptions and information about the relative (or shared) nature of income shifts, while theoretically distinguishing between different types of economic mobility becomes imperative. Greater attention should also be given to how such perceptions might be affected by other concerns (such as political ideology or ethnic identification) and characteristics of the information environment (e.g., local conditions, elite discourse, and media framing).

In summary, more work needs to be done to extend our theoretical framework, connect these experimental results with observational data, and more firmly establish the mechanisms at work. Yet our preliminary data are quite robust and not properly explained by the main theoretical frameworks in political science. It is our hope that we have provided a compelling and testable theoretical model that can be easily expanded to account for additional concerns, along with conceptual clarity on the effects of different types of income shifts

that can advance our knowledge of the relationship between economic cycles and redistributive preferences. Finally, we hope to have provided a useful experimental design by which to engage in controlled tests of these and related issues regarding taxation and government spending.

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