Self-Centered Inequity Aversion and the Mass Politics of Taxation[1]

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Abstract

The politics of economic crises bring distributive economic conflict to the fore of national political debates. How policy should be used to transfer resources between citizens becomes a central political question and the answers chosen often influence the trajectory of policy for a generation. This context provides an ideal setting for evaluating the importance of self-interest and other-regarding preferences in shaping public opinion about economic policy. This paper investigates whether self-centered inequity aversion along with self-interest influences individual tax policy opinions. We conduct original survey experiments in France and the United States and provide evidence that individuals care both about how policy alternatives affect their own interests and how they influence the welfare of others relative to themselves. Our estimates suggest that in France both disadvantageous inequality aversion—utility losses when others have better economic outcomes—and advantageous inequality aversion—utility losses when others have worse economic outcomes—are important determinants of tax policy preferences. In the United States, we find strong evidence of disadvantageous inequality aversion but not advantageous inequality aversion. The results for both countries suggest that self-interest and other-regarding preferences influence tax policy preferences and the findings in France are strongly consistent with self-centered inequity aversion.

1 Introduction

The politics of economic crises bring distributive economic conflict to the fore of national political debates. How economic activity is to be regulated and how policy should be used to transfer resources between citizens become central political questions and the answers chosen often influence the trajectory of policy for a generation or at least until the next crisis. The recent "Great Recession" has been no different. Around the world, governments have struggled to arrive at new policies that regulate economic activity more effectively, that provide a stimulus to economic growth, and that address sometimes severe fiscal imbalances. Long-standing economic problems such as inequality, long-term unemployment, and social exclusion have gained significant salience.

This context provides an ideal setting for evaluating determinants of economic policy preferences. This paper focuses on identifying whether and how inequality aversion along with self-interest influences public preferences about tax policy. Taxation was and continues to be at the heart of economic policy debates during and after the Great Recession. Tax debates focused both on revenue questions as countries sought to stabilize their finances and on distributive questions as states sought to address problems like high and growing inequality.

We argue that inequality aversion and self-interest can lead to systematic differences in support for alternative tax policies. The theoretical framework that we adopt in this paper for explaining how inequality aversion influences tax policy opinions is based on the premise that individuals are altruistic toward others if their material payoffs are below an equitable benchmark but envious of others whose payoffs are above this level (Fehr and Schmidt, 1999). Specifically, we focus on self-centered inequity aversion for which the equitable benchmark for a given individual is his or her own outcome. In this framework, individuals do not care about inequity generally but are interested in the fairness of their own outcome relative to others (Fehr and Schmidt 1999, 819). This form of inequity aversion has two distinct parts. *Advantageous inequality aversion* is the loss individuals incur because others have

worse material outcomes than they do, while *disadvantageous inequality aversion* is the loss individuals incur because others have better outcomes than they do.

To test this model of tax preferences, we conducted in 2010 original survey experiments on national samples of individuals in France and the United States. We pursue two different types of empirical strategies in the analysis with this data. First, we evaluate experimentally how variation in the incomes of the beneficiaries of various tax policies influence support for those policies. We show that opinions about tax policy vary systematically with information provided about the incomes of those affected by policy alternatives. Respondents are generally more supportive of policies that benefit lower income recipients or create costs for higher income recipients. Second, we adopt a specific formalization of self-centered inequity aversion, incorporate this utility function into standard models of tax preferences for which the effect of policy alternatives on one's own income is of primary concern, and estimate structurally an equation of policy preferences. We find that individuals care about the effect of tax policy on their own incomes but also exhibit advantageous and disadvantageous inequality aversion. Specifically, our estimates suggest that in France both disadvantageous inequality aversion and advantageous inequality aversion are important determinants of tax policy preferences. In the United States, we find strong evidence of disadvantageous inequality aversion but not advantageous inequality aversion. Finally, in a 2014 original survey in the United States, we directly investigate the willingness of respondents to choose preferred tax policy alternatives that transparently make them worse-off under conditions for which the only benefit of this cost is a simultaneous reduction of both advantageous and disadvantageous inequality and find further evidence of self-centered inequity aversion.

The paper contributes to the existing literatures on tax policy preferences and redistributive preferences more generally in at least two ways.[1] First, existing research that considers

[1]See Alesina and Giuliano (2009) for a review of research on preferences over redistribution and Kuziemko et. al. (2013) for a review of work on tax policy opinions. Previous empirical work has focused on factors such as the role of self-interest (see e.g. McCarty, Poole, and Rosenthal 2007; Alesina and Giuliano 2009; Margalit 2013); beliefs about income mobility (Alesina and La Ferrara 2005); the structure of inequality (Lupu and Pontusson 2011); the specificity of labor-market skills (Iversen and Soskice 2001); the correlation of low income and economic insecurity (Rehm, Hacker, and Schlesinger 2012); beliefs about the sources of

the potential influence of other regarding preferences has primarily focused on altruism—closely related to *advantageous inequality aversion*—rather than envy—closely related to *disadvantageous inequality aversion*—(see e.g. Alesina and Giuliano (2009) and Duch and Rueda (2014), but see also Bartels 2008). When inequality aversion has specifically been considered, it is primarily viewed as a generalized preference for equal socio-economic outcomes. Our paper argues that both forms of inequality aversion are potentially important for understanding tax and redistributive policy preferences. By adopting Fehr-Schmidt, self-centered inequity preferences to a tax policy environment that closely resembles the income tax policies currently under debate in advanced industrial democracies, we develop precise predictions for how and for whom such preferences influence policy opinions.

Second, this formal framework allows us to develop a new research design for studying the role of fairness concerns generally and inequality aversion specifically on tax policy preferences. Previous research on the potential role of other-regarding preferences such as altruism or some general form of inequality aversion has primarily relied on individual-level cross-sectional regressions with very strong identification assumptions and even, for these results, the evidence is often based on indirect indicators open to multiple interpretations. A typical empirical analysis might regress a measure of support for redistributive policies on an attitude measure such as a belief about the economy or a general measure of psychological orientation and conclude that the partial correlation between these measures is evidence of some form of altruism or inequality aversion. Examples of indirect evidence include studies which note differences in opinion support across sex or racial categories and infer differences in altruism. Other studies rely on aggregated time series evidence. Our approach is to use the combination of experimental survey data and an estimating equation derived from our

income—e.g. hard work and effort versus luck and connections—and the subsequent impact on evaluations of inequality and policy alternatives (Alesina and Angeletos 2005); competing social identities (Shayo 2009); ethnic and racial heterogeneity (Luttmer 2001; Alesina and Glaeser 2004; Duch and Rueda 2014); religion (Scheve and Stasavage 2006; Huber and Stanig 2011; Stegmueller 2013); value differences and whether policy alternatives are associated with those differences (see e.g. Bartels 2008; Kuziemko et. al. 2013; McCall 2013; and Page and Jacobs 2013); and competing tax fairness norms (e.g. Scheve and Stasavage 2010, 2012; Roberts and Hite 1994).

theoretical model to structurally estimate both advantageous and disadvantageous inequality aversion parameters. Using this methodology as well as investigating a number of alternative observable implications of our argument, we present a great deal of evidence consistent with our model, particularly for France, and more generally find considerable support for the influence of disadvantageous inequality aversion in both countries.

The paper is organized as follows. In Section 2, we incorporate self-centered inequity aversion into a formal model of tax policy preferences. Section 3 describes the surveys and the design of the experiments, reports the basic experimental treatment effects, and presents an empirical analysis estimating the influence of advantageous and disadvantageous inequality aversion on tax opinion formation. Section 4 presents the results of an original follow-up survey that shows the willingness of respondents to select policies costly to themselves in order to reduce inequality. Section 5 offers some concluding remarks.

2 Self-Centered Inequity Aversion and Taxation

The implications of self-centered inequity aversion for policy opinions about taxation can be illustrated by considering a simple model of tax policy preferences. Our model has two key features that distinguish it from existing models of taxation. First, we adopt a tax policy instrument that closely mirrors actual income tax policies in advanced industrial democracies in that marginal rates are selected that apply to all income earned above a given threshold. Second, we explicitly incorporate self-centered inequity aversion into individual utility functions. The combination of these features allows us to generate specific predictions about under what conditions and for whom self-centered inequity aversion matters for policy opinions and provides a theoretical foundation for our structural estimates in the empirical work.

First consider the case in which individuals care only about the impact of tax policy on their own after-tax incomes. To illustrate the key ideas, we consider a setting with three

different groups of individuals with identical incomes within each group and of equal size. Let w_i be an exogenous wage of individuals in group i, and we index the wage such that $w_i > w_{i-1}$. Note that because all individuals in each group are identical, we use i to index and refer to groups and individuals. Consistent with modern income tax systems, we model a multi-dimensional tax policy that specifies marginal tax rates across the income distribution. Let τ_i be the tax rate imposed on incomes in group i, and $\tau_i \in [0, 1]$. $\gamma\tau_i^2$ is the inefficiency lost in taxation for income group i and $\gamma > 0$. Individual i's utility is defined by:

$$u_i = T(i) + \frac{1}{3}F(\cdot) - \frac{1}{3}\sum_{i=1}^{3}\gamma\tau_i^2 \tag{1}$$

$T(i)$ is the after-tax income for individuals, and $\frac{1}{3}F(\cdot)$ is the per capita lump sum redistributive transfer, where $F(\cdot) = \{\tau_1 w_1 + [\tau_1 w_1 + \tau_2(w_2 - w_1)] + [\tau_1 w_1 + \tau_2(w_2 - w_1) + \tau_3(w_3 - w_2)]\}$. In this equation, the lowest income group has an after-tax income of $T(1) = (1-\tau_1)w_1$. The middle income group has an after-tax income of $T(2) = (1 - \tau_1)w_1 + (1 - \tau_2)(w_2 - w_1)$. In other words, individuals in this group only pay a tax rate of τ_2 for the part of income that is greater than w_1. In a similar vein, the highest income group has an after-tax income of $T(3) = (1 - \tau_1)w_1 + (1 - \tau_2)(w_2 - w_1) + (1 - \tau_3)(w_3 - w_2)$, and $-\frac{1}{3}\sum_{i=1}^{3}\gamma\tau_i^2$ is the per capita inefficiency lost from taxation.

Table 1 reports the optimal tax rates, τ_i^{j*}, for each target income group i preferred by each income group j (j like i indexes groups/individuals).[2] The subscript on τ indicates the group to which the tax will be applied and the superscript on τ indicates the group whose policy preferences are being described. As a result of self-interest, individuals in group 1 prefer no taxes on themselves, and a positive tax rate on income categories 2 and 3 (Column 1). For individuals in group 2, they prefer $\tau_1^{2*} = 0$ because part of their income will be taxed at this rate. However, they prefer a positive tax rate on income category 3 (Column 2). Individuals in group 3 prefer no taxes for all income categories (Column 3).

[2]See Online Appendix for further details of derivation of preferred tax rates. We assume $\tau_i \in [0, 1]$ and $\gamma > 0$, and thus rule out negative taxes.

Tax on Target Income Group	Preferences of Income Group		
	1	**2**	**3**
τ_1	$\tau_1^{1*} = 0$	$\tau_1^{2*} = 0$	$\tau_1^{3*} = 0$
τ_2	$\tau_2^{1*} = \frac{w_2 - w_1}{\gamma}$	$\tau_2^{2*} = 0$	$\tau_2^{3*} = 0$
τ_3	$\tau_3^{1*} = \frac{w_3 - w_2}{2\gamma}$	$\tau_3^{2*} = \frac{w_3 - w_2}{2\gamma}$	$\tau_3^{3*} = 0$

Table 1: Preferred Tax Rates by Income Group without Self-centered Inequity Aversion. The subscript on τ indicates the group to which the tax will be applied and the superscript on τ indicates the group whose policy preferences are being described.

Although this simple baseline model is described primarily to provide a comparison for a model that incorporates self-centered inequity aversion, it is worth noting that this model highlights the possibility that preferences for progressive taxes might be observed even if individuals only consider their own interests, that tax policy preferences generally increase with inequality (differences between w_i's), and that tax preferences generally decrease with greater inefficiency (γ).[3]

To incorporate self-centered inequity aversion as in Fehr and Schmidt (1999), we alter the utility function described above as:

$$\begin{aligned} u_i &= T(i) + \frac{1}{3}F(\cdot) - \frac{1}{3}\sum_{i=1}^{3}\gamma\tau_i^2 - \frac{\alpha}{2}\sum_{i\neq j}\max\{T(j) - T(i), 0\} \\ &\quad -\frac{\beta}{2}\sum_{i\neq j}\max\{T(i) - T(j), 0\} \end{aligned} \tag{2}$$

To account for inequity aversion, we incorporate a social preference term ($-\frac{\alpha}{2}\sum_{i\neq j}\max\{T(j) - T(i), 0\} - \frac{\beta}{2}\sum_{i\neq j}\max\{T(i) - T(j), 0\}$) into the individual's utility function. The term for inequity aversion is equivalent to the specification in Equation (1) in Fehr and Schmidt (1999: 822). $T(i)$ is after-tax income of individual i. As in Fehr and Schmidt, the parameter β measures utility loss from *advantageous inequality* when $T(i) > T(j)$, and the parameter α measures the utility loss from *disadvantageous inequality* when $T(i) < T(j)$. We assume in

[3]These predictions echo some of the main ideas in the foundational models in this literature such as Romer (1975) and Meltzer and Richard (1981).

Tax on Target Income Group	Preferences of Income Group		
	1	**2**	**3**
τ_1	$\tau_1^{1**} = 0$	$\tau_1^{2**} = 0$	$\tau_1^{3**} = 0$
τ_2	$\tau_2^{1**} = \frac{w_2 - w_1}{\gamma}(\frac{3\alpha+2}{2})$	$\tau_2^{2**} = \frac{w_2 - w_1}{\gamma}(\frac{3\beta-2}{4})$	$\tau_2^{3**} = \frac{w_2 - w_1}{\gamma}(\frac{3\beta-2}{4})$
τ_3	$\tau_3^{1**} = \frac{w_3 - w_2}{2\gamma}(\frac{3\alpha+2}{2})$	$\tau_3^{2**} = \frac{w_3 - w_2}{2\gamma}(\frac{3\alpha+2}{2})$	$\tau_3^{3**} = \frac{w_3 - w_2}{\gamma}(\frac{3\beta-2}{2})$

Table 2: Preferred Tax Rates by Income Group with Self-centered Inequity Aversion. The subscript on τ indicates the group to which the tax will be applied and the superscript on τ indicates the group whose policy preferences are being described.

our theoretical discussion that $\alpha > \beta > 0$, consistent with Fehr and Schmidt (1999).[4]

The consequences of advantageous and disadvantageous inequality aversion for tax policy preferences can be illustrated by again considering the preferred tax preferences across groups.[5] Table 2 reports the tax rates, τ_i^{j**}, for each target income group i preferred by each income group j.

For income group 1, the preferred tax rate on income categories 2 and 3 is increasing in the disadvantageous inequality parameter α. Moreover, because $\frac{3\alpha+2}{2} > 1$, $\tau_2^{1**} > \tau_2^{1*}$ and $\tau_3^{1**} > \tau_3^{1*}$. That is, disadvantageous inequality aversion induces the lower income group to prefer higher tax rates for higher income groups than would be preferred if self-interest alone determined policy opinions. Individuals in income group 1 still prefer a zero tax rate on the lowest income category. For income group 2, the effect of disadvantageous inequality is similar to that for group 1. It increases the preferred rate on the highest income group. Because rates are by assumption bounded at zero, advantageous inequality aversion has no impact on the preferences of income group 2 on the optimal tax on the lowest income category—the preferred tax is still zero. However, the preferred tax rate on income category 2 is increasing in advantageous inequality parameter β.[6] Critically, advantageous inequality

[4]See Sobel (2005) and Fehr and Schmidt (2006) for reviews of self-centered inequity aversion and other models of social-preferences. Note that empirically the claim is not that all individuals are averse to inequality but that there are at least a significant proportion of individuals who are and that this preference has an important effect on opinion and behavior.

[5]In the analysis presented, we assume that the combination of the magnitude of the differences in income across groups and the extent of inefficiencies from high tax rates are such that the set of tax policies under consideration does not change the ordering of group income.

[6]More specifically, if $\beta > 2/3$, preferred taxes increase as β increases and if $\beta <= 2/3$, preferences do not vary with β because they are bound at zero.

aversion can induce income group 2 to tax themselves. This result is replicated for income group 3's preferred tax positions for income categories 2 and 3. Advantageous inequality aversion can motivate the highest income group to tax themselves and the preferred rate is increasing in the advantageous inequality parameter.

To summarize, we expect that individual tax policy opinions depend on how tax policies influence the after-tax income of individuals and the extent of advantageous and disadvantageous inequality. The expectation is that there is a preference for policies that equalize income generally and more specifically that individuals will be less willing to reduce the income of those who earn less than they do—that is, they will exhibit advantageous inequality aversion in their policy opinions—and more willing to reduce the incomes of those who make more than they do—that is, they will exhibit disadvantageous inequality aversion in their policy opinions. Self-centered inequity aversion shapes policy preferences in combination with factors such as the extent of inequality and efficiency costs and thus is complimentary to standard accounts of tax policy opinions.

3 Inequity Aversion and Self-Interest in Tax Policy Preferences

In this section we use national samples of individuals from France and the United States to provide a series of diverse empirical tests for evaluating the importance of self-centered inequity aversion and self-interest in opinion formation about tax policy. We pursue two different types of empirical strategies in this section. First, we evaluate experimentally how variation in the incomes of the individuals to be taxed influences support for those policies. We show that opinions about tax policy vary systematically with information provided about the incomes of those affected by policy alternatives. Respondents are generally more supportive of tax policies that create costs for higher income recipients. Second, we use our model of self-centered inequity aversion to derive an empirical model of tax policy preferences and

estimate its parameters. We find strong evidence that individuals exhibit disadvantageous inequality aversion in both countries and more mixed evidence of advantageous inequality aversion, with it being clearly evident in France but not in the United States. Consistent with self-interested concerns, our estimates indicate that, all else equal, individuals are less likely to support taxes on themselves. Finally, we conduct several analyses that evaluate alternative interpretations of our findings.

3.1 Main Experimental Design

The empirical analysis in this section is based on evidence from original surveys conducted in the summer of 2010. The surveys were conducted over the internet for a national sample of the French and U.S. adult populations with 2,175 and 2,487 respondents respectively.[7] The sample in each country is a quota sample with quotas set to target the adult population for employment status (e.g. in the United States: working as an employee, working self-employed, not working on temporary layoff from a job, not working looking for a job, not working retired, not working disabled, not working student, not working other). The quotas were set on employment status to ensure that we had a sample with representative experiences with earning income from both labor and non-labor sources and paying taxes as well as individuals experiencing unemployment during the financial crisis. The samples are representative on the quota characteristics and broadly representative of the adult populations on other observed characteristics such as sex, age, and education, but they are not random samples.[8] As such, we will focus on analyses which either take advantage of the various survey experiments conducted or control for key observable demographic characteristics that might differ in our sample and a random sample. While it is possible that there are differential treatment effects for the participants in this survey and a random sample

[7]The surveys were conducted by Qualtrics, `www.qualtrics.com`. The design was reviewed and granted an exemption by Yale University's Human Subjects Review Committee.

[8]The United States sample had a somewhat higher proportion of women, had a bit more middle-aged respondents with fewer respondents under 35, and was more highly educated. The French sample had fewer respondents over 55 and more under 40, and was a bit more highly educated. See Online Appendix for descriptive statistics.

of each population, this seems unlikely to be the case.[9] This section describes two sets of experiments on tax policy, which were conducted as part of each survey. The two experiments are presented as alternative and complementary tests to evaluate the robustness of our estimates.[10]

The first experiment investigates if individual policy preferences about increasing income taxes to decrease the budget deficit are sensitive to the income levels at which the tax increase would be applied.

The United States version of the question used to elicit support for tax increases was:

> When the U.S. economy recovers from the current economic recession, the Federal government is expected to face a significant budget deficit because it spends more money than it collects. Reducing the deficit requires increased taxes, decreased spending, or both. One proposal being considered to help with the budget deficit once the economy has recovered is to increase income taxes on individuals who earn X dollars or more per year. Do you favor or oppose this tax increase?
>
> IF FAVOR: Do you strongly favor or only somewhat favor this tax increase?
>
> IF OPPOSE: Do you strongly oppose or only somewhat oppose this tax increase?

The value of X was assigned randomly across respondents to be equal to 40,000, 80,000, and 125,000 dollars per year in the United States.[11] These values were chosen so that respondents were considering tax increases for average, high, and very high earners. In terms of the theoretical model presented in the previous section, the experimental manipulation is of the wage or earnings (w_i) of the threshold at which the income tax increase will apply. Experimental variation in the income of the group to be taxed will allow us to estimate the degree of advantageous and disadvantageous inequality aversion exhibited in our respondents' policy opinions. In each case, the assumption is that the additional revenue collected is used

[9] One important piece of evidence consistent with the argument that the experimental results reported here are likely to be the same as for a random sample of the U.S. population is that the trade-policy experiment discussed in the Online Appendix is a replication of Lü, Scheve, and Slaughter (2012) which did use a random sample and the results across the two experiments are quite similar.

[10] The order of these two experiments within each survey, as well as the other experiments conducted as part of the larger instrument, was randomly rotated to avoid contamination across experiments.

[11] We conducted several types of balance tests, each of which indicated that the observed characteristics of the respondents were balanced across treatment groups. See Online Appendix for further details.

to reduce the deficit. An analogous question was asked in the French survey with respondents randomly assigned to consider a tax increase for individuals with monthly incomes greater than or equal to 2,100, 4,200, or 10,000 euros. Average support for such such a tax increase in our sample was 57.3% in France 46.8% in the United States.

The second experiment investigates if individual policy preferences about how progressive the income tax system should be are sensitive to the income levels considered.

The United States version of the question used to elicit support for tax progressivity was:

> Do you think individuals with incomes higher than X dollars per year should pay a larger share of their income in taxes than those with low incomes, the same share, or a smaller share?
> IF LARGER: Should the share be much larger or somewhat larger?
> IF SMALLER: Should the share be much smaller or somewhat smaller?

The value of X was again assigned randomly across respondents to be equal to 40,000, 80,000, and 125,000 dollars per year in the United States and 2,100, 4,200, or 10,000 euros per month in France. Average support for a "larger share" was 57.2% in France and 41.5% in the United States.

3.2 Main Experimental Results

For the deficit reduction and income tax experiment, we constructed the variable *Income Tax Opinion* set equal to one for respondents who favor raising income taxes and zero for those opposed.[12]

Table 3 reports the mean estimates for each income treatment category and difference-in-means estimates for each combination of income treatments. The top panel reports results for the United States and the bottom panel reports the results for France. For each country, the initial estimates are for the full sample, the second set of estimates are for respondents with incomes less than 2,100 euros per month for France and 40,000 dollars per year for the

[12]We also constructed an alternative measure *Income Tax Opinion 2* , which, is set equal to 1 for respondents who oppose raising income taxes strongly, 2 for respondents who oppose raising taxes somewhat, 3 for respondents who favor raising income taxes somewhat, and 4 for those who favor raising income taxes strongly. All the results reported in the paper are qualitatively the same using this measure.

United States, and the third set are for respondents with incomes greater than 10,000 euros per month for France and 125,000 dollars per year for the United States. The means for the full sample reflect the impact of tax increases on the rates that some respondents will themselves face as well as the impact on other income groups. In contrast, the lower income subsamples would not be directly affected by any of the proposed tax increases while higher income subsamples would be impacted by all of the proposals.

Overall, the results reported in Table 3 provide substantial evidence that support for income tax increases to balance the budget in each country are influenced significantly by the income levels of those affected by the tax. For example, in the United States support for a tax increase is about 26 percentage points higher (nearly a 100% increase) when the threshold is set to apply to incomes greater than 80,000 dollars per year compared to when it is set to apply to incomes greater than 40,000 dollars per year. The difference between the 125,000 and 40,000 dollar thresholds is 32 percentage points. These differences are both substantively and statistically significant. The analogous differences for France are even larger.

The interpretation, however, of these results for assessing the importance of self-interest and inequality aversion is ambiguous. These differences could be exclusively driven by self-interest. A substantial part of the income distribution is populated by individuals with incomes between the treatment incomes and the differences may just reflect different assessments of the desirability of the tax based on whether it will apply to them individually. The mean differences between the full sample and the lower income samples in each country suggests that the impact of tax increases on higher income respondents reduces overall support. It is worth noting though that the sensitivity of opinion to the tax threshold is evident in the lower income subsamples in both countries who would not be directly affected by the tax. Our theoretical model highlights that, nevertheless, these differences might be predicted with purely self-interested policy preferences because the marginal benefit of taxing wealthy citizens is higher (see Table 1). That said, it should also be noted that the

model suggests that if individual opinions are influenced by self-centered inequity aversion, there is a stronger expectation for preferences in support of higher taxes on high incomes and relatively lower taxes on low incomes as observed in our data. An arguably more discerning comparison can be made by considering the high income groups, our model highlights that only in the case in which policy preferences are influenced by self-centered inequity aversion is there any expectation that high earners will also prefer progressive rates (see Table 2). Our results for high income respondents in both countries are consistent with this prediction with the caveat that the estimates for this group are less precise because there are many fewer respondents.[13]

For the tax progressivity experiment, we constructed the variable *Progressive Tax Opinion* set equal to one for respondents who favor individuals with incomes over the threshold paying a larger share of their income in taxes and zero for those who favor the same share or a smaller share.[14]

Table 4 reports the mean estimates for each income treatment category and difference-in-means estimates for each combination of income treatments. The top panel reports results for the United States and the bottom panel reports the results for France.

The results reported in Table 4 follow the same broad pattern as the deficit reduction and income tax increase experiment. In both countries, support for progressivity in the tax system increases as the income threshold under consideration increases. The magnitude of the differences across treatment groups are broadly similar to those in the first experiment. The most noticeable difference is that the difference between the high and medium income treatment groups is larger and more precisely estimated in the progressivity experiment. It is again worth noting that the sensitivity to the income threshold is observed both in the

[13]More precisely, there are a sufficient number of high income respondents to precisely estimate differences in the United States. For France, the magnitude of the differences are larger but the test is somewhat underpowered. In unreported results, we estimated differences across treatment categories controlling for sex, age, and education. These estimates closely mirror those reported in Table 3.

[14]We also constructed an alternative measure *Progressive Tax Opinion 2* , which, is set equal to 1 for respondents who favor a much smaller share, 2 for respondents who favor a somewhat smaller share, 3 for respondents who favor the same share, 4 for those who favor a somewhat larger share, and 5 for those who favor a much larger share. All the results reported in the paper are qualitatively the same using this measure.

full sample and in the lower income sample that would not be directly affected by greater progressivity above the threshold. Further, it is again the case that respondents in the lower income sample are generally more supportive of progressivity which is consistent with the prediction that at least some opposition to progressivity is due to self-interest and the impact of higher taxes on relatively higher income respondents. The results for the high income groups follow the same general pattern as in the first experiment but preferences for higher taxes on the wealthy are only clearly discernable in the French sample. The overall pattern of the treatment effects in Table 4 is broadly what we would expect if self-centered inequity influenced tax policy opinions. Nonetheless, it is important to keep in mind that our model suggests that progressivity in tax preferences may be observed even if respondents are purely self-interested. It is also the case that other models of other-regarding preferences might yield similar predictions. Given these potential competing interpretations of the experimental results, we probe the results of these experiments further to determine the extent to which they provide evidence for the importance of advantageous and disadvantageous inequality aversion in addition to self-interest in the formation of tax policy opinions and we turn to that task in the next section.

3.3 Estimation of Inequity Aversion Parameters

The approach that we take in this section is to use our theoretical model of self-centered inequity aversion and tax preferences to derive an empirical model of policy preferences and estimate the advantageous inequality and disadvantageous inequality parameters.

We start with the extended individual utility function in our model, Equation (2), introduce an error term, ϵ_i, and specify its distribution. The error term should be thought to be composed primarily of those factors influencing opinion about the tax rate not included in our model. We assume that ϵ_i is normally distributed and that it enters the function additively.

We further simplify the model in several ways. First, we omit the term $\frac{1}{3}F(\cdot)$, which is the

per capita lump sum transfer. Since this transfer does not vary across individuals, it will be captured by the constant in the estimating equation. In a similar vein, we also omitted the disutility from inefficiency in taxation, $-\frac{1}{3}\sum_{i=1}^{3}\gamma\tau_i^2$, which also does not vary across individuals and will be captured by the constant. Second, the survey question forces respondents to focus on one group of individuals at a time and so we consider only income differences between the individual and the individuals in income group for which the tax is to be applied. Third, we substitute pre-tax income for post-tax income. The tax rate τ_i changes the ratio of the estimates for α and β and so this substitution only changes the scale of α and β parameters. This is also the case for the estimated coefficient for income, w_i.[15] Given these assumptions, we have the following model:

$$Z_i(\tau) = \phi_1 w_i - \alpha[\max\{w_j - w_i, 0\}] - \beta[\max\{w_i - w_j, 0\}] + \epsilon_i \text{ where } i \neq j \tag{3}$$

Let z_i^F be the utility to individual i from introducing higher tax rates and z_i^O be the utility to individual i from the status quo policy without higher tax rates. We assume that our survey respondents answer our question favoring or opposing higher tax rates by selecting the policy option that yields the highest utility. Let $Y^* \equiv z_i^F - z_i^O$. If $y^* > 0$, the individual favors higher tax rates and otherwise will be opposed. Further, let $y_i = 1$ if $y^* > 0$ and $y_i = 0$ otherwise. Y^* is the difference between two normally distributed variables and is itself normally distributed. As such, the probability that an individual favors $P(Y^* > 0) = P(Y = 1)$ or opposes $P(Y^* \leq 0) = P(Y = 0)$ higher tax rates can be derived from the standard normal CDF. This yields:

$$P(Y = 1) = \Phi(\phi_0 + \phi_1 w_i - \alpha[\max\{w_j - w_i, 0\}] - \beta[\max\{w_i - w_j, 0\}]) \tag{4}$$

where $\Phi(\cdot)$ is the standard normal CDF and ϕ_0, ϕ_1, α, and β are parameters to be estimated. We model the differences in utility under the new tax rate and the status quo

[15]Given this assumption, it is also implied that tax changes do not alter the relative ordering of income groups and subsequently we can order income groups using pre-tax income.

by allowing α, β, and ϕ to vary across the two conditions with $\alpha^F(\beta^F, \phi^F)$ differing from $\alpha^O(\beta^O, \phi^O)$ because of the change in after-tax incomes due to the new tax rate. In Equation 4, $\alpha = \alpha^F - \alpha^O$, $\beta = \beta^F - \beta^O$, and $\phi = \phi^F - \phi^O$ as only the difference is identified.

To estimate the parameters of this model, we use responses from both the deficit reduction and income tax increase experiment and the progressive tax experiment. The dependent variables are *Income Tax Opinion* and *Progressive Tax Opinion* as defined above. The initial estimating equation is:

$$P(Y = 1) = \Phi(\phi_0 + \phi_1 Personal\ Income\ Greater + \alpha Disadvantageous\ Inequality + \beta Advantageous\ Inequality) \quad (5)$$

We estimate this equation as a probit and report heteroskedastic-consistent standard errors. *Disadvantageous Inequality* and *Advantageous Inequality* are defined as implied in Equation 4. *Disadvantageous Inequality* is equal to the income threshold in the tax question considered by the respondent minus the income of the respondent if that difference is positive and is equal to zero if not. *Advantageous Inequality* is equal to the income of the respondent minus the income threshold in the tax question considered by the respondent if that difference is positive and is equal to zero if not. *Personal Income Greater* is equal to one if the respondent's income is greater than the income threshold in the tax question and zero if not. We also estimate and present results with additional control variables for demographic characteristics including gender, age, and education as well as state fixed effects in the U.S. specifications.[16]

The first hypothesis is that $\alpha > 0$ because if the respondent's income is below the threshold at which the tax increase (or progressivity) would apply, the tax increase will lower the after-tax returns to individuals with salaries greater than the respondent reducing

[16]See appendix Tables A-12 and A-13 for specifications that control for additional demographic variables such as race and marital status and in some specifications partisanship and/or ideology. We note that neither partisanship nor ideology is likely an appropriate control variable in these regressions as it is likely a consequence of the redistributive preferences we are trying to measure.

his or her loss from disadvantageous inequality. The second hypothesis is that $\beta > 0$ because a tax increase (or progressivity) above the threshold will apply both to lower income groups and to the respondent but since the respondent has a higher income, the overall impact is to reduce differences in after-tax incomes and thus his or her loss from advantageous inequality. The third hypothesis is that $\phi_1 < 0$ because *Personal Income Greater* indicates that the proposed tax applies to the respondent and if it does, this reduces the respondent's after-tax income.

Table 5 reports the main results for the increase in the income tax experiment. The coefficient estimates for the disadvantageous inequality parameter are as predicted and statistically significant across both specifications in France and the United States. For Model 1 in the United States, the estimated probit coefficient, α, for the variable *Disadvantageous Inequality* is equal to 0.0072 with a standard error of 0.0008. This indicates that, all else equal, individuals are more supportive of income tax increases, the greater the difference between a respondent's own income and the threshold of the income tax increase. The magnitude of the disadvantageous inequality effect is substantial. To get a sense of the substantive magnitude of this estimate, the effect of increasing the *Disadvantageous Inequality* measure from 0—the value assigned to the variable when the respondent has an income greater than or equal to the treatment threshold—to 38.3—a one standard deviation increase—on the probability of supporting the tax increase, holding all other variables at their means is 0.107 (standard error of 0.012). This means that the probability of favoring the income tax change increases about 11 percentage points, which is about a 23% increase from the overall mean of the *Income Tax Opinion* measure. The analogous quantity for Model 3 in the French case is 0.133 (standard error of 0.013) and suggests that disadvantageous inequality has a similarly large substantive effect on tax opinion in France.

The coefficient estimates for the advantageous inequality parameter are positive as predicted but only substantively and statistically significant in the French data. For Model 3 in France, the estimated probit coefficient, β, for the variable *Advantageous Inequality*

is equal to 0.048 with a standard error of 0.024. The magnitude of the effect is substantively important. The effect of increasing the *Advantageous Inequality* measure from 0—the value assigned to the variable when the respondent has an income less than or equal to the treatment threshold—to 1.43—a one standard deviation increase—on the probability of supporting the tax increase, holding all other variables at their means is 0.027 (standard error of 0.013). This means that the probability of favoring the income tax policy change increases 2.7 percentage points (about 4.7% of the overall mean). Again, it is important to note that there is no evidence for the importance of advantageous inequality in opinion formation for the United States.

In the income tax increase to reduce the budget deficit experiment, it is also important to note the estimates for ϕ_1 indicating the extent to which being exposed to the proposed tax increase influences opinion about the policy proposal. Across both specifications in France and the United States, the estimates for ϕ_1 are negative, substantively large, and statistically significant. For example, in the United States, the difference between being subject to the tax and not being subject to the tax decreases the probability of supporting the proposal by 18.6 percentage points in the Model 1 specification. In France using the Model 3 specification, the equivalent quantity is 28.8 percentage points.

Table 6 reports the results for the progressive income tax experiment. Qualitatively, these estimates are quite similar to those for the income tax increase and deficit reduction experiment. Across both specifications for each country, the estimates for α and ϕ_1 are in the expected directions and substantively and statistically significant. The results are strongly consistent with the suggested role for both disadvantageous inequality aversion and self-interest. The estimates for β are more mixed. The estimates for the United States are positive but small and statistically insignificant. The estimates for France are positive, substantively significant, and statistically significant for Model 4 that includes additional control variables.

Overall, the estimates in Tables 5 and 6 provide robust evidence that disadvantageous

inequality aversion has an important effect on policy opinions about raising taxes in France and the United States and that advantageous inequality aversion is clearly evident in the French case. This is consistent with our emphasis on the importance of other-regarding considerations in explaining opinion formation about tax policy. Further, the results for France are entirely consistent with self-centered inequity aversion. At the same time, the findings provide a substantial reminder that a role for other-regarding preferences does not imply that self-interest does not also matter for economic policy opinions.[17]

3.4 Does Income Mobility Explain Results?

One concern about the survey evidence described above is that respondents' policy preferences could be shaped by their expected upward or downward income mobility above and below the income tax thresholds. This possibility is particularly relevant for interpreting our parameter estimates for disadvantageous inequality. It could be that for individuals below the threshold at which the tax will be applied, those with incomes further from the threshold are less optimistic that they will eventually have incomes above the threshold and thus are more willing to support higher taxes. It is less clear that income mobility considerations could account for the predicted positive effect of advantageous inequality on support for higher taxes.

To address this alternative, we conducted two additional survey experiments in both France and the United States.[18] Both experiments elicit respondent support for policies that will influence the incomes of others working in specific industries but not directly impact the income of the respondent. The first experiment targets workers in the banking sector with greater regulation while the second experiment targets workers in a hypothetical industry

[17]The idea that individuals prefer economic outcomes for others that do not depart too far from their own outcomes raises the question of how sharply they use their own outcomes as a point of reference. In this section, we assume that losses from self-centered inequity aversion arise from sharp comparisons to their own outcome but it may be that individuals only care about outcomes that depart substantially from their own. In the Online Appendix, we explore various fuzzy thresholds as alternative model specifications, and test whether such models fit the data better than our original models. We show that our original model specification offers better fit with our data than alternative model specifications with fuzzy thresholds.

[18]These experiments were conducted in summer 2010 as part of the surveys described above.

with greater trade protection. In each case, we argue that it is not plausible to think that the results are driven by the possibility that respondents of different incomes are going to be working in the affected sectors in the future. The remainder of this section focuses on describing the results of the banking regulation experiment and briefly describes the results from the trade experiment. A full discussion of the trade results are reported in the Online Appendix.

The banking regulation experiment asks respondents to consider the introduction of increased regulations and randomly assigns a frame for the average income of workers in the banking industry. We exclude all respondents working in the financial sector from our analysis so that the proposed regulation arguably only has an impact on the after-tax incomes of others.

The United States version of the question used to elicit support for increased banking regulation was:

> The average income for workers in the U.S. banking industry is X dollars per year. The Federal government is considering increased regulations on this industry. Some economists argue that these regulations will reduce financial innovation which helps the economy grow while others argue that it will reduce the risk of financial crises. Do you favor or oppose these new banking regulations?
>
> IF FAVOR: Do you strongly favor or only somewhat favor new banking regulations?
>
> IF OPPOSE: Do you strongly oppose or only somewhat oppose new banking regulations?

where X was set at either \$50,000 or \$100,000 per year in the United States and €3,000 or €6,000 in France. These values were chosen to indicate an "above average" and "high" income for the banking sector. Either value is plausible depending on the exact definition of the banking sector and class of workers that one considers.

For the banking regulation experiment, we constructed a measure of support for increased regulation, *Bank Regulation Opinion*, which is set equal to 1 for respondents who favor increased regulation and 0 for those opposed.[19]

[19]We also constructed the variable *Bank Regulation Opinion 2*, which is set equal to 1 for respondents

Table 7 reports the mean estimates for each treatment category and difference-in-means estimates for each combination of treatments. These results provide substantial evidence that support for increased regulation in both countries is influenced by the average wage of workers in the industry. In the United States, support for increased regulation is about 8 percentage points higher when the primed average income for the industry is 100,000 dollars per year compared to when the prime is 50,000 dollars per year. The difference for France is almost precisely the same magnitude. These treatment effects are broadly consistent with self-centered inequity aversion and are not easily explained by expectations about income mobility.

To bolster our interpretation, we again estimate the advantageous and disadvantageous inequality aversion parameters, β and α, in a structural model. Our estimating equation is:

$$P(Y = 1) = \Phi(\phi_0 + \alpha \textit{Disadvantageous Inequality} + \beta \textit{Advantageous Inequality}) \qquad (6)$$

This equation is almost identical to that derived for the income tax increase and progressive tax experiments. The difference is simply that the respondent's own income drops out of the derivation because it is unaffected by the proposed regulations.[20] The dependent variable is *Bank Regulation Opinion* and the model is estimated as a probit with heteroskedastic consistent standard errors. *Disadvantageous Inequality* is defined as in the other experiments except that the "other" income level is determined by the treatments for the bank regulation experiment. The first hypothesis is that $\alpha > 0$ because increased banking regulations will lower incomes in the banking sector and to the extent that respondents exhibit disadvantageous inequality aversion in their preferences, lowering these bankers' incomes increases the utility of individuals who have incomes lower than the threshold. The second hypothesis is that $\beta < 0$ because increasing banking regulations will lower incomes in the banking sector

who oppose increased regulation strongly, 2 for respondents who oppose increased regulation somewhat, 3 for respondents who favor increased regulation somewhat, and 4 for those who favor increased regulation strongly. The results reported here are replicated for the *Bank Regulation Opinion 2* measure.

[20] We exclude all respondents working in the banking sector from the analysis.

and for a respondent with an income above the average of this sector, this will result in a utility loss if that individual is influenced by advantageous inequality aversion. We report each set of results with a specification based on the theoretical model only (Models 1 and 3) and a specification with additional demographic control variables (Models 2 and 4).

Across all four specifications reported in Table 8 for each country, the estimates for the *Disadvantageous Inequality* parameter, α, are positive and statistically significant. This result is consistent with our hypothesis that disadvantageous inequality influences opinion about economic policies and is not easily explained by income mobility arguments. The estimates for the *Advantageous Inequality* parameter, β, vary in sign across the two cases and are not statistically significant. These results are consistent with the tax experiments for the United States but inconsistent with the findings for France. One possible reason for the later inconsistency is that the banking industry is not viewed as disadvantaged regardless of the value of the treatment. This seems particularly credible given the trade policy results that we discuss below.

One additional result for the banking regulation analysis merits attention. The specifications in Table 8 for Models 2 and 4 include an indicator variable as in the tax analyses for whether or not the respondent's income is above the treatment income. In the case of the tax experiments, the theoretical expectation was that self-interested considerations would lead respondents above the threshold to have more negative views of tax increases. For the banking regulation analysis, there is not such an expectation and indeed the parameter estimates for the variable indicating whether the respondent's income is above the treatment income are small and statistically insignificant. This bolsters our previous interpretation of our negative estimates for the tax experiments as consistent with self-interest considerations influencing policy opinions.

In addition to the bank regulation experiment, we also conducted a trade policy experiment in each country which was also focused on sectors and does not lend itself to an income mobility explanation for the disadvantageous parameter estimates. The appendix reports

the results of these analyses. The estimates suggest that both advantageous and disadvantageous inequality influence sector-specific trade-policy opinions in France and the United States.[21]

4 Paying for Equality

A simple implication of the idea that self-centered inequity aversion contributes to public preferences for progressive tax systems is that individuals will be willing to choose tax system alternatives that require themselves to pay higher taxes if those alternatives reduce relative income differences. To test this implication directly and to provide clear evidence that tax policy opinions cannot be explained by self-interest alone, we fielded a follow-up survey in the United States in 2014. The survey was carried out online by YouGov, which employs matched sampling to approximate a random sample of the adult population (Rivers 2011). Our sample size was 500.

The question we asked was the following:

> Many observers in the United States have suggested that the Federal Government's budget deficit should be addressed with a combination of spending cuts and income tax increases. Suppose that federal income taxes are going to be increased in order to raise revenue to help decrease the deficit. We are interested in what you think about different plans for increasing income taxes.
>
> We will now provide you with several proposals for increasing income taxes all of which raise about the same amount of revenue. We will always show you two possible proposals in comparison. For each comparison we would like to know which of the two tax codes you prefer. You may like both or not like either one. In any case, choose the one you prefer the most. In total, we will show you four comparisons.

[21] See also Lü, Scheve, and Slaughter (2012) for additional trade policy opinion evidence.

People have different opinions about this issue and there are no right or wrong answers. Please take your time when reading the potential changes.

For each choice, we showed the respondent two plans. Plan A proposed to increase individual income taxes by 1 percentage point for individuals making less than $25,000, between $25,000 and $200,000, and greater than $200,000 per year. Plan B proposed a 0 percentage point increase for individuals making less than $25,000, a randomly assigned alternative from the set 1.1, 1.25, and 1.5 percentage point increases for those making between $25,000 and $200,000, and a randomly assigned alternative from the set 2, 3, and 4 percentage point increases for those making greater than $200,000. The key empirical question is, among respondents who make between $25,000 and $200,000, what is the percentage of choices for Plan B which involves a higher tax on the middle income group but a lower tax on the low income group and a higher tax on the high income group. Are individuals willing to pay for policies that decrease self-centered inequality?[22]

Table 9 reports the answers to this question. Among respondents who make between $25,000 and $200,000, 57% of them select the Plan B alternative which involves higher taxes on themselves. This estimate indicates that a majority of respondents are willing to pay in order to reduce inequality through the tax system. Immediately after making their four choices, we asked the respondents to reflect on why they made the choices that they did. We first asked an open-ended question which asked them to explain the reasons for their final choice. The general pattern in the results was that those individuals who chose Plan A emphasized that it was fair for everyone to pay equally and those who chose Plan B argued that it was fair that the rich pay more and/or that the poor should not have to pay. We then asked explicitly to what extent the respondent considered "whether the rich paid more than the poor" and "whether the poor paid too much" in deciding between the plans. Table 9 reports how strongly respondents gave these answers to justify their Plan B choices.[23]

[22]Note that this central question is focused on the choice between Plan A and Plan B under all experimental conditions. The experimental interventions primarily allow us to further evaluate whether the price to the respondent for choosing Plan B matters and we discuss this result briefly below.

[23]We also asked here how much they considered "whether the plan was fair". Not surprisingly given the

Overall, responses to these questions suggest a willingness of a significant portion of survey respondents to select costly tax policies to reduce inequality.

5 Conclusion

Mass political behavior in the midst of an economic crisis provides a unique lens for studying distributive political conflict and the determinants of political opinion and behavior. This paper points to any one of the millions of citizens who have voted, marched, or rioted to advocate or protest one policy position or another in their national political debate on how best to respond to the crisis and asks why did those citizens take the positions that they did and why did they often seem so invested in the debate. It seems likely that self-interest plays an important role in answering these questions. Having often already lost much in the crisis itself, individual citizens are acutely aware of the consequences of policy change on their individual welfare. Moreover, economic crises are often periods of significant policy change with long-lasting distributional consequences. In short, with so much at stake, it would be surprising if self-interest did not inform policy opinions and behavior in the national debate. However, the theatre of these political debates suggests the possibility that other considerations may also be central to determining the positions that citizens take and their behavior in the political process. The German or American taxpayer or Greek or Spanish civil servant is not outraged simply because they will lose from some new policy under consideration though that may be part of the story. Rather, their policy position and outrage is in part because the policy alternative under consideration either resonates or is in conflict with their sense of fairness.

In this paper, we investigate how one specific understanding of fairness—inequality

open-ended answers, answers to this question did not divide Plan A and Plan B respondents well—they had different fairness standards in mind. We also asked how much they considered "how much you personally would pay". Although answers to this question also did not divide respondents strongly, analysis of the embedded experiment in the choice between plans suggests that respondents were less likely to choose Plan B, the higher the treatment tax rate on the middle income group—a pattern of responses consistent with self-interest being a consideration.

aversion—influences individual policy opinions about tax policy in the context of an economic crisis. We argue that attitudes about inequality—both advantageous and disadvantageous inequality—can lead to systematic differences in support for higher income taxes. Individuals not only consider how policy alternatives affect their own interests but also how they affect the incomes of others relative to their own.

The paper provides a rich set of empirical tests that are consistent with the claim that other-regarding preferences are a significant determinant of tax policy opinions. Our estimates suggest that in France both disadvantageous inequality aversion and advantageous inequality aversion are important determinants of tax policy preferences. In the United States, we find strong evidence of disadvantageous inequality aversion but not advantageous inequality aversion. The results for both countries suggest that self-interest and other-regarding preferences influence tax policy preferences and the findings in France are strongly consistent with self-centered inequity aversion. That said, it is possible that another form of inequality aversion or some other other-regarding mechanism is generating the pattern of preferences observed across the experiments. We have provided evidence that some of the most likely alternatives do not fit the data as well as the influence of self-centered inequity aversion, but we have not exhausted the alternatives. Exploring new experiments and analyses to evaluate alternative mechanisms further seems a productive task for future research.

The implications of our findings are important for understanding the larger political determinants of economic policymaking in addition to understanding the motivations of voters over distributional issues. Self-centered inequality aversion helps explain why income tax policies have generally evolved to be progressive in most countries around the world. If there is cross-national variation in the extent of inequality aversion, it may also help explain why some countries adopt more progressive tax systems than others. Self-centered inequality aversion also implies that we should expect an increase demand for more progressive tax policies when inequality increases—this effect essentially multiplies the effects of increased

inequality predicted by purely self-interested models (e.g. Meltzer and Richard 1981). To some extent, we see these expectations borne out in contemporary policy debates. Generally, as inequality has increased, many countries have experienced calls for more progressive tax policies. More specifically, the evidence in this paper that self-centered inequality aversion is more clearly evident in France than the United States may help account for the sense that French politics has seen a greater push toward more progressive taxation in response to the economic crisis and increasing inequality and social exclusion. That said, as Bonica, McCarty, Poole, and Rosenthal (2013), Scheve and Stasavage (2010, 2012), and many others have argued, in practice democracy and inequality have not been sufficient conditions for countries to adopt high taxes on the the wealthy. It may be that inequality aversion supports progressive taxation to some degree but is not a sufficiently powerful fairness norm in most countries to induce policymakers to implement highly progressive tax systems.

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	Mean Estimates by Treatment Category			Difference Estimates		
United States						
	$40k	**$80k**	**$125k**	**$40k-$80k**	**$40k-$125k**	**$80k-$125k**
Income Tax Opinion	0.270	0.528	0.594	-0.258	-0.324	-0.065
Full sample (n=2,487)	(0.016)	(0.017)	(0.017)	(0.023)	(0.023)	(0.024)
				0.000	0.000	0.007
Income Tax Opinion	0.330	0.619	0.657	-0.289	-0.327	-0.038
Less Than $40K Sample (n=1,253)	(0.023)	(0.024)	(0.024)	(0.033)	(0.033)	(0.034)
				0.000	0.000	0.261
Income Tax Opinion	0.234	0.214	0.415	0.020	-0.181	-0.201
Greater Than $125K Sample (n=168)	(0.062)	(0.055)	(0.062)	(0.083)	(0.088)	(0.083)
				0.813	0.041	0.017
France						
	€2.1k	**€4.2k**	**€10k**	**€2.1k-€4.2k**	**€2.1k-€10k**	**€4.2k-€10k**
Income Tax Opinion	0.280	0.677	0.733	-0.397	-0.453	-0.056
Full Sample (n=2,175)	(0.017)	(0.017)	(0.016)	(0.024)	(0.023)	(0.024)
				0.000	0.000	0.018
Income Tax Opinion	0.332	0.733	0.733	-0.401	-0.401	0.000
Less Than €2.1K Sample (n=1,348)	(0.023)	(0.020)	(0.021)	(0.031)	(0.031)	(0.029)
				0.000	0.000	1.000
Income Tax Opinion	0.263	0.455	0.545	-0.191	-0.282	-0.091
Greater Than €10K Sample (n=63)	(0.104)	(0.109)	(0.109)	(0.150)	(0.150)	(0.154)
				0.210	0.068	0.557

Table 3: Estimated Effect of Income Threshold on Support for Income Tax Increases to Reduce the Deficit—United States and France. Columns 1-3 report mean estimates for *Income Tax Opinion* by treatment category and the standard error of the estimate in parentheses. Columns 4-6 report difference-in-means tests, the standard error in parentheses, and p-value assuming unequal variances.

	Mean Estimates by Treatment Category			Difference Estimates		
United States						
	$40k	**$80k**	**$125k**	**$40k-$80k**	**$40k-$125k**	**$80k-$125k**
Progressive Tax Opinion	0.247	0.439	0.557	-0.192	-0.310	-0.118
Full sample (n=2,487)	(0.015)	(0.017)	(0.017)	(0.023)	(0.023)	(0.024)
				0.000	0.000	0.000
Progressive Tax Opinion	0.307	0.526	0.622	-0.220	-0.316	-0.096
Less Than $40K Sample (n=1,253)	(0.023)	(0.024)	(0.024)	(0.033)	(0.033)	(0.034)
				0.000	0.000	0.005
Progressive Tax Opinion	0.292	0.328	0.322	-0.036	-0.030	0.006
Greater Than $125K Sample (n=168)	(0.066)	(0.061)	(0.061)	(0.090)	(0.090)	(0.086)
				0.688	0.737	0.946
France						
	€2.1k	**€4.2k**	**€10k**	**€2.1k-€4.2k**	**€2.1k-€10k**	**€4.2k-€10k**
Progressive Tax Opinion	0.276	0.647	0.778	-0.371	-0.502	-0.131
Full sample (n=2,175)	(0.017)	(0.018)	(0.015)	(0.024)	(0.023)	(0.023)
				0.000	0.000	0.000
Progressive Tax Opinion	0.305	0.710	0.803	-0.405	-0.498	-0.093
Less Than €2.1K Sample (n=1,348)	(0.022)	(0.022)	(0.019)	(0.031)	(0.029)	(0.029)
				0.000	0.000	0.001
Progressive Tax Opinion	0.235	0.500	0.667	-0.265	-0.431	-0.167
Greater Than €10K Sample (n=63)	(0.106)	(0.109)	(0.098)	(0.152)	(0.145)	(0.147)
				0.090	0.005	0.263

Table 4: Estimated Effect of Income Threshold on Support for Progressive Income Taxation—United States and France. Columns 1-3 report mean estimates for *Progressive Tax Opinion* by treatment category and the standard error of the estimate in parentheses. Columns 4-6 report difference-in-means tests, the standard error in parentheses, and p-value assuming unequal variances.

	Probit Model Estimates			
	U.S.	**U.S.**	**France**	**France**
	Model 1	**Model 2**	**Model 3**	**Model 4**
	Coefficient Estimates	**Coefficient Estimates**	**Coefficient Estimates**	**Coefficient Estimates**
Disadvantageous Inequality, α	0.0072	0.0074	0.1003	0.1029
	(0.0008)	(0.0009)	(0.0099)	(0.0099)
	0.000	0.000	0.000	0.000
Advantageous Inequality, β	0.0004	0.0009	0.0483	0.064
	(0.0017)	(0.0018)	(0.0242)	(0.0246)
	0.813	0.614	0.046	0.009
Personal Income Greater, ϕ_1	-0.4853	-0.5318	-0.7432	-0.8303
	(0.1072)	(0.1114)	(0.1085)	(0.1115)
	0.000	0.000	0.000	0.000
Demographic Controls	No	Yes	No	Yes
State Fixed Effects	No	Yes	No	No
Log-likelihood	-1582.6	-1506.2	-1330.8	-1293.8
Observations	2,479	2,414	2,162	2,118

Table 5: Support for Income Tax Increases to Reduce Budget Deficit—United States and France, Probit Estimates. The table reports the results of probit regressions for the variable *Income Tax Opinion* on *Disadvantageous Inequality*, *Advantageous Inequality*, and various control variables. For each model, the table reports the probit coefficient estimates for each variable, their heteroskedastic-consistent robust standard errors in parentheses, and p-values. A constant term is included in each regression but not reported in the table.

	Probit Model Estimates			
	U.S.	**U.S.**	**France**	**France**
	Model 1	**Model 2**	**Model 3**	**Model 4**
	Coefficient Estimates	**Coefficient Estimates**	**Coefficient Estimates**	**Coefficient Estimates**
Disadvantageous Inequality, α	0.0073	0.0076	0.1385	0.1400
	(0.0009)	(0.0009)	(0.0103)	(0.0103)
	0.000	0.000	0.000	0.000
Advantageous Inequality, β	0.0013	0.0012	0.0376	0.0455
	(0.0017)	(0.0018)	(0.0239)	(0.0251)
	0.464	0.502	0.117	0.007
Personal Income Greater, ϕ_1	-0.3966	-0.3849	-0.4099	-0.4520
	(0.1082)	(0.1101)	(0.1022)	(0.1058)
	0.000	0.000	0.000	0.000
Demographic Controls	No	Yes	No	Yes
State Fixed Effects	No	Yes	No	No
Log-likelihood	-1571.6	-1513.3	-1306.3	-1275.1
Observations	2,479	2,425	2,162	2,118

Table 6: Support for Progressive Income Tax—United States and France, Probit Estimates. The table reports the results of probit regressions for the variable *Progressive Tax Opinion* on *Disadvantageous Inequality*, *Advantageous Inequality*, and various control variables. For each model, the table reports the probit coefficient estimates for each variable, their heteroskedastic-consistent robust standard errors in parentheses, and p-values. A constant term is included in each regression but not reported in the table.

	Mean Estimates by Treatment Category		Difference Estimates
United States			
	Middle Wage	**High Wage**	
	$50,000	**$100,000**	**Middle-High**
Bank Regulation Opinion	0.614	0.696	-0.081
	(0.014)	(0.013)	(0.019)
			0.000
Number of Observations	1,167	1,229	
France			
	Middle Wage	**High Wage**	
	€3,000	**€6,000**	**Middle-High**
Bank Regulation Opinion	0.774	0.855	-0.081
	(0.013)	(0.011)	(0.017)
			0.000
Number of Observations	1,113	1,038	

Table 7: Estimated Effect of Average Wage on Support for Increased Banking Regulation—United States and France. Columns 1-2 report mean estimates for *Bank Regulation Opinion* by treatment category and the standard error of the estimate in parentheses. Column 3 reports difference-in-means tests, the standard error in parentheses, and p-value assuming unequal variances.

	Probit Model Estimates			
	U.S.	**U.S.**	**France**	**France**
	Model 1	**Model 2**	**Model 3**	**Model 4**
	Coefficient Estimates	**Coefficient Estimates**	**Coefficient Estimates**	**Coefficient Estimates**
Disadvantageous Inequality, α	0.0038	0.0042	0.0962	0.1147
	(0.0009)	(0.0011)	(0.0199)	(0.0219)
	0.000	0.000	0.000	0.000
Advantageous Inequality, β	-0.0016	-0.0017	0.0019	0.0260
	(0.0012)	(0.0015)	(0.0221)	(0.0317)
	0.171	0.252	0.930	0.413
Demographic Controls	No	Yes	No	Yes
State Fixed Effects	No	Yes	No	No
Log-likelihood	-1522.1	-1454.4	-1016.7	-980.5
Observations	2,389	2,326	2,138	2,118

Table 8: Support for Increased Banking Regulation—United States and France, Probit Estimates. The table reports the results of probit regressions for the variable *Bank Regulation Opinion* on *Disadvantageous Inequality*, *Advantageous Inequality*, and various control variables. For each model, the table reports the probit coefficient estimates for each variable, their heteroskedastic-consistent robust standard errors in parentheses, and p-values. A constant term is included in each regression but not reported in the table.

	Percent Plan B Choices
Respondents with incomes between \$25k and \$200k	56.9
Respondents with incomes between \$25k and \$200k	
Very important rich pay more	78.9
Somewhat important rich pay more	54.5
Somewhat unimportant rich pay more	23.8
Very unimportant rich pay more	10.9
Respondents with incomes between \$25k and \$200k	
Very important whether poor paid too much	80.8
Somewhat important whether poor paid too much	49.4
Somewhat unimportant whether poor paid too much	14.4
Very unimportant whether poor paid too much	1.0

Table 9: Paying for Equality. This table reports the percent of choices by respondents with incomes between \$25,000 and \$200,000 that are for a tax plan with higher taxes for these individuals but lower taxes for individuals with lower incomes and higher taxes for individuals with higher incomes. There are 281 respondents in the sample with incomes in this category and they each make four sets of choices for a total number of observations of 1,124.

Online Appendix

Model of Tax Preferences

This section of our Online Appendix provides the details of our model of income tax policy preferences and the predictions reported in Tables 1 and 2.

First consider the case in which individuals care only about the impact of tax policy on their own after-tax incomes. To illustrate the key ideas, we consider a setting with three different groups of individuals with identical incomes within each group and of equal size. Let w_i be an exogenous wage of individuals in group i, and we index the wage such that $w_i > w_{i-1}$. Note that because all individuals in each group are identical, we use i to index and refer to groups and individuals. Consistent with modern income tax systems, we model a multi-dimensional tax policy that specifies marginal tax rates across the income distribution. Let τ_i be the tax rate schedule imposed on incomes in group i, and $\tau_i \in [0, 1]$. $\gamma\tau_i^2$ is the inefficiency lost in taxation for group i and $\gamma > 0$. Individual i's utility is defined by:

$$u_i = T(i) + \frac{1}{3}F(\cdot) - \frac{1}{3}\sum_{i=1}^{3}\gamma\tau_i^2 \tag{7}$$

$T(i)$ is the after-tax income for individuals, and $\frac{1}{3}F(\cdot)$ is the per capita lump sum redistributive transfer, where $F(\cdot) = \{\tau_1 w_1 + [\tau_1 w_1 + \tau_2(w_2 - w_1)] + [\tau_1 w_1 + \tau_2(w_2 - w_1) + \tau_3(w_3 - w_2)]\}$. In this equation, the lowest income group has an after-tax income of $T(1) = (1 - \tau_1)w_1$. The middle income group has an after-tax income of $T(2) = (1 - \tau_1)w_1 + (1 - \tau_2)(w_2 - w_1)$. In other words, individuals in this group only pay a tax rate of τ_2 for the part of income that is greater than w_1. In a similar vein, the highest income group has an after-tax income of $T(3) = (1 - \tau_1)w_1 + (1 - \tau_2)(w_2 - w_1) + (1 - \tau_3)(w_3 - w_2)$, and $-\frac{1}{3}\sum_{i=1}^{3}\gamma\tau_i^2$ is the per capita inefficiency lost from taxation.

Now consider the preferred tax for each income category by each income group:

Group 1 preference for tax τ_1:

$$\frac{\partial u_1}{\partial \tau_1} = -w_1 + \frac{1}{3}(w_1 + w_1 + w_1) - \frac{2}{3}\gamma\tau_1 = 0$$
$$\Rightarrow \tau_1^{1*} = 0$$

Group 1 preference for tax τ_2:

$$\frac{\partial u_1}{\partial \tau_2} = \frac{2}{3}(w_2 - w_1) - \frac{2}{3}\gamma\tau_2 = 0$$
$$\Rightarrow \tau_2^{1*} = \frac{w_2 - w_1}{\gamma}$$

Group 1 preference for tax τ_3:

$$\frac{\partial u_1}{\partial \tau_3} = \frac{1}{3}(w_3 - w_2) - \frac{2}{3}\gamma\tau_3 = 0$$
$$\Rightarrow \tau_3^{1*} = \frac{w_3 - w_2}{2\gamma}$$

Group 2 preference for tax τ_1:

$$\frac{\partial u_2}{\partial \tau_1} = -w_1 + \frac{1}{3}(w_1 + w_1 + w_1) - \frac{2}{3}\gamma\tau_1 = 0$$
$$\Rightarrow \tau_1^{2*} = 0$$

Group 2 preference for tax τ_2:

$$\frac{\partial u_2}{\partial \tau_2} = -(w_2 - w_1) + \frac{1}{3}(w_2 - w_1 + w_2 - w_1) - \frac{2}{3}\gamma\tau_2 = 0$$
$$\Rightarrow \tau_2^{2*} = -\frac{w_2 - w_1}{2\gamma}$$

Since we assume $\tau_i \in [0, 1]$ and $\gamma > 0$, we constrain $\tau_2^{2*} = 0$.

Group 2 preference for tax τ_3:

$$\frac{\partial u_2}{\partial \tau_3} = \frac{1}{3}(w_3 - w_2) - \frac{2}{3}\gamma\tau_3 = 0$$
$$\Rightarrow \tau_3^{2*} = \frac{w_3 - w_2}{2\gamma}$$

Group 3 preference for tax τ_1:

$$\frac{\partial u_3}{\partial \tau_1} = -w_1 + \frac{1}{3}(w_1 + w_1 + w_1) - \frac{2}{3}\gamma\tau_1 = 0$$
$$\Rightarrow \tau_1^{3*} = 0$$

Group 3 preference for tax τ_2:

$$\frac{\partial u_3}{\partial \tau_2} = -(w_2 - w_1) + \frac{1}{3}(w_2 - w_1 + w_2 - w_1) - \frac{2}{3}\gamma\tau_2 = 0$$
$$\Rightarrow \tau_2^{3*} = -\frac{w_2 - w_1}{2\gamma}$$

Group 3 preference for tax τ_3:

$$\frac{\partial u_3}{\partial \tau_3} = -(w_3 - w_2) + \frac{1}{3}(w_3 - w_2) - \frac{2}{3}\gamma\tau_3 = 0$$
$$\Rightarrow \tau_3^{3*} = -\frac{w_3 - w_2}{\gamma}$$

Again since we assume $\tau_i \in [0, 1]$ and $\gamma > 0$, we constrain $\tau_2^{3*} = 0$ and $\tau_3^{3*} = 0$.

As a result of self-interest, individuals in group 1 prefer no taxes on themselves, and positive tax rates on groups 2 and 3. For individuals in group 2, they prefer $\tau_1^{2*} = 0$ because part of their income will be taxed at this rate. However, they prefer a positive tax rate on group 3. Not very surprisingly, individuals in group 3 prefer no taxes for all groups, because part of their income will be taxed at these rates respectively, given the structure of tax schedule.

To incorporate self-centered inequity aversion as in Fehr and Schmidt (1999), we alter the utility function described above as:

$$\begin{aligned} u_i &= T(i) + \frac{1}{3}F(\cdot) - \frac{1}{3}\sum_{i=1}^{3}\gamma\tau_i^2 - \frac{\alpha}{2}\sum_{i\neq j}\max\{T(j) - T(i), 0\} \\ &\quad -\frac{\beta}{2}\sum_{i\neq j}\max\{T(i) - T(j), 0\} \end{aligned} \tag{8}$$

To account for inequity aversion, we incorporate a social preference term ($-\frac{\alpha}{2}\sum_{i\neq j}\max\{T(j)-T(i),0\}-\frac{\beta}{2}\sum_{i\neq j}\max\{T(i)-T(j),0\}$) into the individual's utility function. The term for inequity aversion is equivalent to the specification in Equation (1) in Fehr and Schmidt (1999: 822). $T(i)$ is after-tax income of individual i. As in Fehr and Schmidt, the parameter β measures utility loss from advantageous inequality when $T(i) > T(j)$, and the parameter α measures the utility loss from disadvantageous inequality when $T(i) < T(j)$. We assume $\alpha > \beta > 0$, consistent with Fehr and Schmidt (1999).

The consequences of advantageous and disadvantageous inequality aversion for policy preferences can be illustrated by again considering the optimal tax preferences across groups. Let's consider them in each case:[24]

Based on the general utility function in Eq(8), the specific utility function of Group 1 is as follows:

$$u_1 = T(1) + \tfrac{1}{3}F(\cdot) - \tfrac{1}{3}\sum_{i=1}^{3}\gamma\tau_i^2 - \tfrac{\alpha}{2}[(T(2)-T(1)) + (T(3)-T(1))]$$
$$\Rightarrow u_1 = T(1) + \tfrac{1}{3}F(\cdot) - \tfrac{1}{3}\sum_{i=1}^{3}\gamma\tau_i^2 - \tfrac{\alpha}{2}[2(1-\tau_2)(w_2-w_1) + (1-\tau_3)(w_3-w_2)]$$

Hence, Group 1 preference for τ_1:

$$\tfrac{\partial u_1}{\partial \tau_1} = -w_1 + \tfrac{1}{3}(w_1+w_1+w_1) - \tfrac{2}{3}\gamma\tau_1 = 0$$
$$\Rightarrow \tau_1^{1**} = 0$$

Group 1 preference for τ_2:

$$\tfrac{\partial u_1}{\partial \tau_2} = \tfrac{2}{3}(w_2-w_1) - \tfrac{2}{3}\gamma\tau_2 - \tfrac{\alpha}{2}[-2((w_2-w_1)] = 0$$
$$\Rightarrow \tau_2^{1**} = \tfrac{w_2-w_1}{\gamma}\left(\tfrac{2+3\alpha}{2}\right)$$

Group 1 preference for τ_3:

[24]In the analysis presented, we assume that the combination of the magnitude of the differences in income across groups and the extent of inefficiencies from high tax rates are such that the set of tax policies under consideration does not change the ordering of group income.

$$\frac{\partial u_1}{\partial \tau_3} = \frac{1}{3}(w_3 - w_2) - \frac{2}{3}\gamma\tau_3 - \frac{\alpha}{2}[-(w_3 - w_2)] = 0$$
$$\Rightarrow \tau_3^{1**} = \frac{w_3 - w_2}{\gamma}\frac{2+3\alpha}{4} = \frac{w_3 - w_2}{2\gamma}\left(\frac{2+3\alpha}{2}\right)$$

As shown above, because $\frac{2+3\alpha}{2} > 1$ in both cases, $\tau_2^{1**} > \tau_2^{1*}$ and $\tau_3^{1**} > \tau_3^{1*}$. That is, disadvantageous inequality induces lower income group to prefer higher tax rates for higher income groups, and the higher the income w_j, the greater the preferred tax rate. Meanwhile, $\tau_1^{1*} = \tau_1^{1**}$, thus inequity aversion does not change the preferred tax rate for its own group.

In a similar vein, the specific utility function of Group 2 is as follows:

$$u_2 = T(2) + \frac{1}{3}F(\cdot) - \frac{1}{3}\sum_{i=1}^{3}\gamma\tau_i^2 - \frac{\alpha}{2}[T(3) - T(2)] - \frac{\beta}{2}[T(2) - T(1)]$$
$$\Rightarrow u_2 = T(2) + \frac{1}{3}F(\cdot) - \frac{1}{3}\sum_{i=1}^{3}\gamma\tau_i^2 - \frac{\alpha}{2}[(1-\tau_3)(w_3 - w_2)] - \frac{\beta}{2}[(1-\tau_2)(w_2 - w_1)]$$

Hence, Group 2 preference for τ_1:

$$\frac{\partial u_2}{\partial \tau_1} = -w_1 + \frac{1}{3}(w_1 + w_1 + w_1) - \frac{2}{3}\gamma\tau_1 = 0$$
$$\Rightarrow \tau_1^{2**} = 0$$

Group 2 preference for τ_2:

$$\frac{\partial u_2}{\partial \tau_2} = -(w_2 - w_1) + \frac{2}{3}(w_2 - w_1) - \frac{2}{3}\gamma\tau_2 + \frac{\beta}{2}(w_2 - w_1) = 0$$
$$\Rightarrow \tau_2^{2**} = \frac{w_2 - w_1}{\gamma}\left(\frac{3\beta - 2}{4}\right)$$

Group 2 preference for τ_3:

$$\frac{\partial u_2}{\partial \tau_3} = \frac{1}{3}(w_3 - w_2) - \frac{2}{3}\gamma\tau_3 + \frac{\alpha}{2}(w_3 - w_2) = 0$$
$$\Rightarrow \tau_3^{2**} = \frac{w_3 - w_2}{2\gamma}\left(\frac{3\alpha + 2}{2}\right)$$

As shown above, the advantageous inequality aversion induces group 2 to increase its own taxes because $\tau_2^{2**} > \tau_2^{2*}$ if $\frac{3\beta-2}{4} > 0$, or $\beta > \frac{2}{3}$. Meanwhile, disadvantageous inequality induces group 2 to prefer higher tax rates for group 3 ($\tau_3^{2**} > \tau_3^{2*}$ if $\frac{3\alpha+2}{2} > 1$ or $\alpha > 0$), and the higher the income w_3, the greater the preferred tax rate. Finally, group 2 prefer a tax rate of 0 with respect to τ_1, which is the same as without inequity aversion.

Finally, the specific utility function of Group 3 is as follows:

$$u_3 = T(3) + \tfrac{1}{3}F(\cdot) - \tfrac{1}{3}\sum_{i=1}^{3}\gamma\tau_i^2 - \tfrac{\beta}{2}[T(3) - T(1) + T(3) - T(2)]$$
$$\Rightarrow u_3 = T(3) + \tfrac{1}{3}F(\cdot) - \tfrac{1}{3}\sum_{i=1}^{3}\gamma\tau_i^2 - \tfrac{\beta}{2}[(1-\tau_2)(w_2 - w_1) + 2(1-\tau_3)(w_3 - w_2)]$$

Hence, Group 3 preference for τ_1:

$$\tfrac{\partial u_3}{\partial \tau_1} = -w_1 + \tfrac{1}{3}(w_1 + w_1 + w_1) - \tfrac{2}{3}\gamma\tau_1 = 0$$
$$\Rightarrow \tau_1^{3**} = 0$$

Group 3 preference for τ_2:

$$\tfrac{\partial u_3}{\partial \tau_2} = -(w_2 - w_1) + \tfrac{2}{3}(w_2 - w_1) - \tfrac{2}{3}\gamma\tau_2 + \tfrac{\beta}{2}(w_2 - w_1) = 0$$
$$\Rightarrow \tau_2^{3**} = \tfrac{w_2 - w_1}{\gamma}(\tfrac{3\beta-2}{4})$$

Group 3 preference for τ_3:

$$\tfrac{\partial u_3}{\partial \tau_3} = -(w_3 - w_2) + \tfrac{1}{3}(w_3 - w_2) - \tfrac{2}{3}\gamma\tau_3 + \tfrac{\beta}{2}[2(w_3 - w_2)] = 0$$
$$\Rightarrow \tau_3^{3**} = \tfrac{w_3 - w_2}{\gamma}(\tfrac{3\beta-2}{2})$$

As shown, advantageous inequality aversion leads individuals in Group 3 to have a higher preferred tax rate for τ_2, because $\tau_2^{3**} > \tau_2^{3*}$ if $\frac{3\beta-2}{4} > 0$, or $\beta > \frac{2}{3}$. Further, advantageous inequality aversion also leads individuals in Group 3 to have a higher preferred tax rate for τ_3 because $\tau_3^{3**} > \tau_3^{3*}$ if $\beta > \frac{2}{3}$. Finally, individuals in Group 3's preference for τ_1 remains 0.

Descriptive Statistics

	Observations	Mean	Std. Dev.
Income Tax Opinion 1	2,487	0.468	0.499
Income Tax Opinion 2	2,483	2.334	1.223
Progressive Tax Opinion 1	2,487	0.415	0.493
Progressive Tax Opinion 2	2,485	3.462	0.750
Bank Tax Opinion 1	2,487	0.651	0.477
Bank Tax Opinion 2	2,479	2.854	1.052
Trade Opinion 1	2,487	0.337	0.473
Trade Opinion 2	2,472	2.200	0.981
Female	2,476	0.552	0.497
Age	2,487	46.402	14.970
College Graduate	2,479	0.409	0.492
Black	2,487	0.063	0.243
Latino	2,487	0.055	0.228
Married	2,484	0.593	0.491
Liberal-Conservative Ideology	2,188	4.265	1.575
Partisanship	2,182	3.918	2.155

Table A-1: U.S. Descriptive Statistics.

	Observations	Mean	Std. Dev.
Income Tax Opinion 1	2,175	0.572	0.495
Income Tax Opinion 2	2,170	2.611	1.248
Progressive Tax Opinion 1	2,175	0.573	0.495
Progressive Tax Opinion 2	2,171	3.745	0.924
Bank Tax Opinion 1	2,175	0.811	0.392
Bank Tax Opinion 2	2,167	3.289	0.904
Trade Opinion 1	2,175	0.343	0.475
Trade Opinion 2	2,161	2.272	1.032
Female	2,152	0.524	0.500
Age	2,173	44.132	14.861
College Graduate	2,155	0.504	0.500
Married	2,175	0.501	0.500
Not Ethnic Minority	2,175	0.892	0.310
Left-Right Ideology	2,163	5.754	2.568

Table A-2: France Descriptive Statistics.

Balance Tests

	Mean Estimates by Treatment Category			Difference Estimates		
U.S. Income Tax Experiment						
	$40k	**$80k**	**$125k**	**$40k-$80k**	**$40k-$125k**	**$80k-$125k**
Female	0.548	0.551	0.556	-0.004	-0.008	-0.005
	(0.018)	(0.017)	(0.017)	(0.025)	(0.025)	(0.024)
				0.886	0.733	0.839
Age	46.386	45.927	46.911	0.459	-0.525	-0.984
	(0.548)	(0.493)	(0.521)	(0.737)	(0.756)	(0.717)
				0.533	0.488	0.170
College Graduate	0.389	0.407	0.429	-0.018	-0.041	-0.022
	(0.017)	(0.017)	(0.017)	(0.024)	(0.024)	(0.024)
				0.447	0.095	0.350
Personal Income	9.490	9.802	9.870	-0.312	-0.380	-0.067
	(0.172)	(0.168)	(0.173)	(0.240)	(0.244)	(0.241)
				0.193	0.120	0.780
U.S. Progressive Tax Experiment						
	$40k	**$80k**	**$125k**	**$40k-$80k**	**$40k-$125k**	**$80k-$125k**
Female	0.541	0.563	0.550	-0.022	-0.009	0.013
	(0.017)	(0.017)	(0.017)	(0.024)	(0.025)	(0.024)
				0.363	0.711	0.592
Age	46.480	46.623	46.096	-0.142	0.384	0.527
	(0.521)	(0.514)	(0.525)	(0.732)	(0.740)	(0.735)
				0.846	0.604	0.474
College Graduate	0.426	0.421	0.379	0.005	0.047	0.042
	(0.017)	(0.017)	(0.017)	(0.024)	(0.024)	(0.024)
				0.832	0.052	0.080
Personal Income	9.658	9.561	9.963	0.097	-0.306	-0.402
	(0.172)	(0.174)	(0.166)	(0.245)	(0.239)	(0.241)
				0.693	0.202	0.095

Table A-3: Summary Statistics for Control Variables—U.S. Columns 1-3 report mean estimates for each control variable by treatment category and the standard error of the estimate in parentheses. Columns 4-6 report difference-in-means tests, the standard error in parentheses, and p-value assuming unequal variances.

	Mean Estimates by Treatment Category			Difference Estimates		
France Income Tax Experiment						
	€2.1k	**€4.2k**	**€10k**	**€2.1k-€4.2k**	**€2.1k-€10k**	**€4.2k-€10k**
Female	0.504	0.545	0.522	-0.041	-0.018	0.023
	(0.019)	(0.019)	(0.018)	(0.027)	(0.026)	(0.026)
				0.126	0.493	0.379
Age	44.668	43.504	44.246	1.163	0.422	-0.741
	(0.571)	(0.552)	(0.535)	(0.794)	(0.783)	(0.769)
				0.143	0.590	0.335
College Graduate	0.488	0.520	0.503	-0.031	-0.015	0.016
	(0.019)	(0.019)	(0.018)	(0.027)	(0.026)	(0.026)
				0.242	0.569	0.531
Personal Income	5.635	5.285	5.545	0.350	0.090	-0.260
	(0.137)	(0.129)	(0.128)	(0.188)	(0.188)	(0.182)
				0.064	0.632	0.154
France Progressive Tax Experiment						
	€2.1k	**€4.2k**	**€10k**	**€2.1k-€4.2k**	**€2.1k-€10k**	**€4.2k-€10k**
Female	0.538	0.527	0.507	0.011	0.030	0.019
	(0.019)	(0.019)	(0.018)	(0.027)	(0.026)	(0.026)
				0.677	0.250	0.458
Age	44.796	43.716	43.921	1.080	0.874	-0.206
	(0.567)	(0.544)	(0.546)	(0.786)	(0.787)	(0.771)
				0.170	0.267	0.789
College Graduate	0.500	0.513	0.499	-0.013	0.001	0.014
	(0.019)	(0.018)	(0.018)	(0.027)	(0.027)	(0.026)
				0.626	0.959	0.584
Personal Income	5.304	5.656	5.490	-0.352	-0.186	0.166
	(0.130)	(0.133)	(0.130)	(0.187)	(0.184)	(0.186)
				0.059	0.313	0.372

Table A-4: Summary Statistics for Control Variables—France Columns 1-3 report mean estimates for each control variable by treatment category and the standard error of the estimate in parentheses. Columns 4-6 report difference-in-means tests, the standard error in parentheses, and p-value assuming unequal variances.

Alternative Models of Self-Centered Inequity Aversion

In our original model specification, we assume that when the treatment income threshold is above or below a respondent's income, an individual will suffer losses from advantageous or disadvantageous inequality aversion. A general alternative is that such losses are experienced only if the difference is large enough. For example, advantageous inequality aversion may not be experienced by an individual when $w_i > w_j$, but only when $w_i > w_j + Z$, where Z is a positive number reflecting magnitude of differences which do generate inequality aversion losses.

To evaluate this idea, we explore various alternative specifications with different thresholds Z. More formally, we have the following alternative model specification:

$$P(Y=1) = \Phi(\phi_0 + \phi_1 \textit{Personal Income Greater} - \alpha[\max\{w_j - (w_i + Z), 0\}] - \beta[\max\{w_i - (w_j + Z), 0\}]) \tag{9}$$

In both United States and French experiments, we explore different values of Z. To adjudicate between these alternative models and our original models, we use the Vuong test (Vuong 1989). This is a non-nested test for model selection. The intuition of this test is the use of likelihood-ratio based statistics to test the null hypothesis that the competing models equally fit the data generating process. The Vuong test is directional, and we set up the test such that a positive test statistic indicates our original model with a sharp threshold fits the data better than the alternative model with a fuzzy threshold. Table A-5 below reports the test statistics.

For the deficit reduction experiment, Table A-5 shows clear evidence to favor our original models for both the United States and French experiments. The Vuong test statistics are large, positive, and statistically significant at the 0.001 level, regardless of different thresholds that we explore. For the progressive tax experiment, the results are a bit more mixed. For the French data, the Vuong tests favor our model at all the fuzzy thresholds, as the test statistics

	Vuong Test Statistics			
	Deficit Reduction Experiment		Progressive Tax Experiment	
United States				
Fuzzy Threshold Z	**Test Stat.**	**P-value**	**Test Stat.**	**P-value**
$5,000	4.576	0.000	0.602	0.547
$10,000	4.580	0.000	0.824	0.410
$15,000	6.587	0.000	1.537	0.124
$20,000	6.578	0.000	1.862	0.063
$25,000	6.570	0.000	2.231	0.026
France				
Fuzzy Threshold Z	**Test Stat.**	**P-value**	**Test Stat.**	**P-value**
€500	7.789	0.000	3.388	0.001
€750	7.466	0.000	3.846	0.000
€1,000	8.136	0.000	4.766	0.000
€1,250	8.137	0.000	5.492	0.000
€1,500	8.138	0.000	6.123	0.000
€1,750	8.760	0.000	6.667	0.000

Table A-5: Vuong Test Statistics—United States and France. The original models are based on the specifications of Models 2 and 4 in Tables 3 and 4 respectively.

are statistically significant at the 0.001 level for all thresholds. For the United States, neither model is favored until $Z >= 20,000$. This mean that for this experiment, it may be that the comparisons individuals make with their own outcomes are not as sharp and that losses from self-centered inequity aversion are only evident if the differences in outcomes are relatively large (in excess of 20,000 dollars per year). Overall, though the evidence presented in this section generally indicates that our baseline model of sharp, self-centered inequity aversion fits the data better than a more elaborate model of fuzzy, self-centered comparisons. It seems likely, however, that this pattern of results might vary across different countries and time periods.

Trade Experiment Results

The trade experiment investigates if individual policy preferences about sector-specific trade protection exhibit inequality aversion. The experiment compliments the evidence from the

banking income experiment in that it is not plausible that the results are accounted for by income mobility because the policy in question is targeted to industries rather than income groups. The experiment is a replication of Lü, Scheve, and Slaughter's (2012) analysis of inequity aversion and trade preferences in China and the United States.

In this experiment, we randomly assigned respondents to consider trade protection for industries with different wage levels and recorded their support for sector-specific trade protection. The United States version of the question used to elicit support for sector-specific trade protection was:

> There is an industry in the United States in which the average worker makes X dollars per year. Some people favor establishing new trade barriers such as import taxes and quotas because trade barriers would increase the wages of workers in this industry. Others oppose new trade barriers because they would raise prices that consumers pay and hurt other industries. Do you favor or oppose these new trade barriers?
>
> IF FAVOR: Do you strongly favor or only somewhat favor new trade barriers for this industry?
>
> IF OPPOSE: Do you strongly oppose or only somewhat oppose new trade barriers for this industry?

The value of X was assigned randomly across respondents to be equal to 1,400, 2,100, and 4,200 euros per month in France and 18,000, 40,000, or 80,000 dollars per year in the United States.[25] These values were chosen so that respondents were considering trade protection for low, average, and high wage industries. For example, in the United States, the low value of $18,000 corresponds to an income a bit higher than the total money income in 2007 for an adult who worked full-time, year-round at the 10th percentile in the income distribution.[26] Alternatively, one can think about this low income amount as the wage earned by a worker who worked full-time, year round at about $9.00 per hour or a bit higher than the minimum wage. The average value was selected as a round value close to the median total money income in 2007 for an adult who worked full-time, year-round of $41,245. Similarly, the high

[25]We conducted several types of balance tests, each of which indicated that the observed characteristics of the respondents were balanced across treatment groups.

[26]The source for this data is the Current Population Survey, Annual Social and Economic Supplement, Table PINC-02.

wage of $80,000 falls at about the 84th percentile in the total money income distribution in 2007.

It is important to compare the wording of this survey question to other questions examined in the literature on the determinants of trade-policy opinions. This question asks respondents whether they favor new trade barriers for a single industry and consequently is more narrowly focused than typical question formats which elicit opinions about general trade policy across an entire economy. Moreover, although not stated explicitly, the wording implies that the industry in question is not the industry in which the respondent works. This question was selected because its sector focus allows the investigation of other regarding preferences more cleanly than a general trade-policy question. The experimental manipulation varies the income of others—in particular workers in another sector—rather than the income of the individual respondent.[27] Consequently, it is possible to investigate how variation in the income of the workers likely to benefit from trade protection influences support for sector-specific trade barriers. Moreover, we use variation in the income of the workers likely to benefit to estimate separately the influence of advantageous and disadvantageous inequality aversion on policy preferences.

The marginal responses to this question are consistent with the intention to elicit support for sector-specific trade policies. Specifically, respondents are much less likely to give a protectionist response when considering a single industry than when answering a question about general trade policy. Again, with the caveat that the samples collected here are quota samples and not meant for describing the French or U.S. population, just 34.3% of French respondents and 33.7% of U.S. respondents favor new trade barriers.[28] This ratio of two-to-one against new sector-specific trade barriers contrasts with responses to more general trade

[27]See Lü, Scheve, and Slaughter (2012) for an economic model consistent with the sector-specific focus of this trade policy question. As the model makes clear, workers in other sectors are worse off from trade protection in a given sector absent inequality aversion, but the critical difference in welfare across the treatments is the income of the beneficiary of the trade protection.

[28]Note that despite the caveat about the sample, the marginal responses for the United States to this question are quite similar to those reported in Lü, Scheve, and Slaughter (2012) which was a random sample of the U.S. population.

policy questions which, depending on question wording, tend to elicit substantially greater support for new trade barriers in each country. There are many possible explanations for this difference in marginal responses, including variation in the experimental treatments corresponding to the average wage levels in the industry under consideration, but such responses are not surprising given that the proposed policy change singles out a specific industry for assistance.

For the trade policy experiment, we constructed a measure of support for new trade barriers based on responses to the trade policy question. *Trade Opinion*, which is set equal to 1 for respondents who favor new trade barriers and is equal to zero for those opposed.[29]

Table A-6 reports the mean estimates for each treatment category and difference-in-means estimates for each combination of treatments. These results provide substantial evidence that support for sector-specific trade barriers in both countries are influenced by the average wage of workers in the industry.[30]

To estimate the advantageous and disadvantageous inequality aversion parameters, β and α, we adopt the same estimating equation as in Lü, Scheve, and Slaughter (2012).[31] The specification is:

$$P(Y = 1) = \Phi(\phi_0 + \alpha \textit{Disadvantageous Inequality} + \beta \textit{Advantageous Inequality}) \tag{10}$$

The dependent variable is *Trade Opinion* described above. *Disadvantageous Inequality* and *Advantageous Inequality* are defined analogously to their definitions for the tax experiments but using the treatment values in the trade experiment to define other income. Note that in the derivation of the estimating equation, personal income drops out because the income in other sectors is unaffected by trade protection targeted in a specific sector. We

[29]We also constructed the variable *Trade Opinion 2*, which is set equal to 1 for respondents who oppose new trade barriers strongly, 2 for respondents who oppose new trade barriers somewhat, 3 for respondents who favor new trade barriers somewhat, and 4 for those who favor new trade barriers strongly. The results reported here are replicated for the *Trade Opinion 2* measure.

[30] The estimates for the United States, including the magnitudes, are also quite close to those reported in Lü, Scheve, and Slaughter (2012).

[31]See Lü, Scheve, Slaughter (2012) for derivation and discussion of control variables.

	Mean Estimates by Treatment Category			Difference Estimates		
United States						
	Low Wage $18,000	**Middle Wage $40,000**	**High Wage $80,000**	**Low-Middle**	**Low-High**	**Middle-High**
Trade Opinion	0.443	0.332	0.239	0.111	0.204	0.093
	(0.017)	(0.016)	(0.015)	(0.024)	(0.023)	(0.022)
				0.000	0.000	0.000
Number of Observations	821	825	841			
France						
	Low Wage €1,400	**Middle Wage €2,100**	**High Wage €4,200**	**Low-Middle**	**Low-High**	**Middle-High**
Trade Opinion	0.408	0.324	0.300	0.084	0.108	0.024
	(0.018)	(0.018)	(0.016)	(0.026)	(0.025)	(0.024)
				0.001	0.000	0.324
Number of Observations	709	692	774			

Table A-6: Estimated Effect of Average Wage of Industry on Support for Trade Protection—United States and France. Columns 1-3 report mean estimates for *Trade Opinion* by treatment category and the standard error of the estimate in parentheses. Columns 4-6 report difference-in-means tests, the standard error in parentheses, and p-value assuming unequal variances.

estimate this equation as a probit model and report heteroskedastic consistent standard errors.

Given the effect of trade protection on incomes (see Lü, Scheve, and Slaughter 2012 for details), the first key hypothesis is that $\alpha < 0$ because sector-specific trade protection will raise the income of workers in that industry, reducing the utility of individuals who have lower incomes than the industry under consideration for trade protection. The second main hypothesis is that $\beta > 0$ because sector-specific trade protection will raise the income of workers in that industry, increasing the utility of individuals who have higher incomes than the industry under consideration for trade protection. In short, new trade barriers increase or decrease inequality depending on your own income and thus the direction of the advantageous and disadvantageous parameters, although both indicating a form of inequality aversion, are in opposite directions.

The initial specification follows directly from the theoretical framework. It is worth noting that for this policy area, the respondent's own income drops out in the derivation of the estimating equation (own income is not affected by the proposed tariff) but is, of course, a component of the *Disadvantageous Inequality* and *Advantageous Inequality* measures. Given that personal income and its correlates such as education have been shown to be associated with trade opinions and is by definition correlated with the *Disadvantageous Inequality* and *Advantageous Inequality* measures, there is substantial concern that the parameter estimates in the baseline specification may be biased. Lü, Scheve, and Slaughter (2012) discuss this issue in some detail and propose a set of alternative specifications that control for the respondent's own income as well as a number of alternative factors. Their approach, in fact, allows for estimation of the *Disadvantageous Inequality* and *Advantageous Inequality* parameters relying only on variation in these variables generated by random assignment in the survey experiment. We replicate those specifications for our data and report results for these specifications and the baseline in Tables A-7 and A-8.

Across all four specifications for each country, the estimates for the *Disadvantageous*

	Probit Model Estimates			
	Model 1	**Model 2**	**Model 3**	**Model 4**
	Coefficient Estimates	**Coefficient Estimates**	**Coefficient Estimates**	**Coefficient Estimates**
Disadvantageous Inequality, α	-0.103	-0.082	-0.077	-0.040
	(0.026)	(0.035)	(0.035)	(0.050)
	0.000	0.019	0.029	0.422
Advantageous Inequality, β	0.000	0.145	0.150	0.125
	(0.016)	(0.069)	(0.071)	(0.099)
	0.996	0.034	0.035	0.207
Personal Income		0.027	-0.027	-0.038
		(0.048)	(0.053)	(0.082)
		0.568	0.603	0.642
Personal Income Greater		0.346	0.191	0.240
		(0.160)	(0.169)	(0.245)
		0.031	0.258	0.327
Personal Income Greater $*$		-0.167	-0.103	-0.081
Personal Income		(0.079)	(0.083)	(0.120)
		0.035	0.213	0.501
Demographic Controls	No	No	Yes	Yes
Industry Fixed Effects	No	No	No	Yes
Log-likelihood	-1380.4	-1377.3	-1326.6	-669.2
Observations	2,162	2,162	2,118	1,075

Table A-7: Inequity Aversion and Support for Trade Protection in France, Probit Estimates. The table reports the results of probit regressions for the variable *Trade Opinion* on *Advantageous Inequality*, *Disadvantageous Inequality*, and various control variables. For each model, the table reports the probit coefficient estimates for each variable, their heteroskedastic-consistent robust standard errors in parentheses, and p-values. A constant term is included in each regression but not reported in the table.

	Probit Model Estimates			
	Model 1	**Model 2**	**Model 3**	**Model 4**
	Coefficient Estimates	**Coefficient Estimates**	**Coefficient Estimates**	**Coefficient Estimates**
Disadvantageous Inequality, α	-0.007	-0.008	-0.009	-0.010
	(0.001)	(0.002)	(0.002)	(0.003)
	0.000	0.000	0.000	0.002
Advantageous Inequality, β	0.000	0.007	0.007	0.006
	(0.001)	(0.002)	(0.002)	(0.002)
	0.730	0.000	0.001	0.010
Personal Income		-0.008	-0.007	-0.010
		(0.002)	(0.002)	(0.003)
		0.000	0.000	0.002
Personal Income Greater		0.114	0.088	-0.003
		(0.127)	(0.131)	(0.203)
		0.368	0.501	0.990
Personal Income Greater $*$		-0.000	-0.000	0.004
Personal Income		(0.003)	(0.003)	(0.004)
		0.970	0.909	0.308
Demographic Controls	No	No	Yes	Yes
State Fixed Effects	No	No	Yes	Yes
Industry Fixed Effects	No	No	No	Yes
Log-likelihood	-1563.5	-1545.2	-1473.2	-789.7
Observations	2,479	2,479	2,421	1,308

Table A-8: Inequity Aversion and Support for Trade Protection in the United States, Probit Estimates. The table reports the results of probit regressions for the variable *Trade Opinion* on *Disadvantageous Inequality*, *Advantageous Inequality*, and various control variables. For each model, the table reports the probit coefficient estimates for each variable, their heteroskedastic-consistent robust standard errors in parentheses, and p-values. A constant term is included in each regression but not reported in the table.

Inequality parameter, α, are negative and statistically significant. Given the design of the trade experiment, this result is consistent with our hypothesis that disadvantageous inequality influences opinion about economic policies. In the United States, the estimates for the *Advantageous Inequality* parameter, β, are positive and statistically significant across the three specifications that include some sort of control for the respondent's own income. Given our relative confidence in these specifications, these estimates are strongly consistent with the hypotheses that advantageous inequality can also influence opinion formation about economic policies. For France, the coefficient estimates for β follow the same pattern as the United States—essentially zero in the baseline specification and positive in all specifications that control for own income— but in the specification that includes industry fixed effects is not statistically significant (this specification results in the loss of about half the observations in the sample in France because of relatively low labor force participation). Nonetheless, the general pattern of results is quite similar to the estimates for the United States and is consistent with both advantageous and disadvantageous inequality aversion influencing opinion formation in a setting for which it is not plausible that income mobility could account for the relationship.

Banking Tax and Inefficiency Experiment Results

Our theoretical model predicts that respondents will prefer lower taxes if taxes are believed to generate economic inefficiencies because they reduce the incentives of individuals and companies to work, invest, and innovate. This section reports the result of an additional experiment and analysis that investigates the impact of making such inefficiencies salient and whether these inefficiencies influence the impact of inequity aversion on tax policy opinions. Specifically, the experiment investigates if individual policy preferences about special income taxes for workers in the banking industry exhibit self-centered inequality aversion in both the United States and France. Like the banking regulation and trade policy experiments discussed above, the income for the treatment group in this experiment is sector specific

and so this analysis provides another test of our framework that eliminates concerns that our estimates of the advantageous and disadvantageous inequality aversion parameters are driven by expectations of upward or downward income mobility.

To do this, we randomly assigned respondents to consider the introduction of a new tax on banker incomes with different salaries at which the tax would apply. We exclude all respondents working in the financial sector so that the proposed tax only has an impact on the after-tax incomes of others. For this experiment, we also varied the economic costs of the tax in order to probe the extent to which the importance of other-regarding preferences vary with the assumed costs of the policy.

The United States version of the question used to elicit support for a special bank income tax was:

> One proposal being considered as part of the reform of the U.S. financial system is the introduction of a new tax on banker incomes. One version of this proposal would be an additional tax of X dollars on all banking salaries above Y dollars per year. This additional tax could be used to help reduce the deficit. One criticism of this proposal is that higher taxes are costly in terms of tax collection and fewer incentives for bankers to work and invest. These costs might mean that for every 1,000 dollars of lost income for bankers only Z dollars of revenue is raised to reduce the budget deficit. Do you favor or oppose this new tax on bankers?
>
> IF FAVOR: Do you strongly favor or only somewhat favor this new tax on bankers?
>
> IF OPPOSE: Do you strongly oppose or only somewhat oppose this new tax on bankers?

The values of X and Y were assigned randomly across respondents to be equal to 1,000, 2,000, and 3,000 dollars and 100,000, 200,000, and 300,000 dollars respectively in the United States. We used the same values in euros in France.[32] The values of Z were assigned randomly across respondents to be equal to 900 and 500 dollars in the United States with the same values in euros in France. The values of X and Y were chosen so that respondents were considering a special tax on banking incomes of comparable relative magnitude but applied

[32]We conducted several types of balance tests, each of which indicated that the observed characteristics of the respondents were balanced across treatment groups.

at different income levels. While an argument certainly could be made that a percentage tax rate might be more realistic, we chose an absolute additional tax to keep the question simple and easy to understand. The values of Z are set to correspond to a "Low Cost" and "High Cost" condition. For the "Low Cost" treatment, the assumption is that incentive effects of the tax and administrative costs are relatively small while in the "High Cost" treatment they are relatively large. In each case, the assumption is that the additional revenue collected is used to reduce the deficit and the reduction of the deficit does not have a direct impact on the individual's own income.[33] Consequently, the experimental manipulation focuses on two dimensions, the income level of the treatment category of individuals likely to be harmed by the tax and the costliness of the tax. Given the context of public debate about the financial crises, it is not surprising that this tax received substantial support among respondents with 61.8 percent of respondents favoring the tax in the United States and 70.4 percent in France.

For the banker's tax experiment, we constructed a measure of support for a new tax on banking incomes based on responses to the question described above. *Bank Tax Opinion* is set equal to 1 for respondents who favor the new tax and is equal to zero for those opposed.[34]

Table A-9 reports the mean estimates for each income treatment category and difference-in-means estimates for each combination of income treatments for both the United States and France. The estimates are separated between the "Low Cost" and "High Cost" treatment conditions. The results provide some modest evidence that opinion is sensitive to the degree of inefficiency of the proposed tax. For the respondents in the highest income threshold treatment group in each country, those respondents who received the high cost treatment had lower support for the new banking tax. This effect is either not observed or the differences are relatively small in the low and middle income threshold treatment groups.

[33]For example, this would be the case if the main beneficiary of the transfer is the next generation of tax payers. Again, we also eliminate all respondents working in the financial sector for this analysis so that there is no possibility that the tax has a direct effect on their own tax liabilities.

[34]We also constructed *Bank Tax Opinion 2* which is set equal to 1 for respondents who oppose the new tax strongly, 2 for respondents who oppose the new tax somewhat, 3 for respondents who favor the new tax somewhat, and 4 for those who favor the new tax strongly. The key results reported here for *Bank Tax Opinion* are replicated for the alternative *Bank Tax Opinion 2* variable.

The income threshold treatments in the United States follow the same pattern as the other experiments discussed in the paper. Support for a new banking tax increases as the income threshold at which the tax would be applied increases. These differences are relatively large and statistically significant for the low cost treatment group, but smaller for the high cost group (and only the difference between the highest and lowest income threshold is statistically significant in the high cost group). This means that respondents are more favorable of a bank tax that applies to higher income bankers but only if such a policy is not too costly. The income threshold effects for this experiment in France represent an exception to the general pattern of results reported in the paper. Raising the income threshold does not increase support and there is even some evidence of a small negative effect on support. Further, the high cost treatment does not mitigate the impact of the income threshold treatments as in the United States. There are a number of potential contextual explanations for the French results. For example, there may have been a widespread belief that the financial sector needed substantial regulation and that the 300,000 euro threshold was simply too high to have the desired regulatory impact. Alternatively, the experimental treatments may have all been so high that they were all roughly considered "high" incomes by respondents. In any event, the results for this experiment in France represent an exception to the overall pattern presented in the paper.

We also estimate the disadvantageous inequality aversion parameter for the banking tax experiment. Note that it is not possible to estimate advantageous inequality aversion parameter for this experiment. The experiment employs treatments that vary the income threshold at which the tax will apply. These thresholds are at €100,000, €200,000, and €300,000 for France and $100,000, $200,000, and $300,000 for the United States and because the surveys top code personal income at €144,000 for France and $175,000 for the United States, it is not clear that any respondents make more money than the second or third treatments. Moreover, because the survey is broadly representative of the population, there are only a couple of hundred observations above above the lower treatments as well. Finally,

	Mean Estimates by Treatment Category			Difference Estimates		
U.S. Low Cost Treatment						
	$100k	**$200k**	**$300k**	**$100k-$200k**	**$100k-$300k**	**$200k-$300k**
Bank Tax Opinion	0.560	0.636	0.718	-0.076	-0.158	-0.082
	(0.025)	(0.025)	(0.022)	(0.035)	(0.034)	(0.033)
				0.031	0.000	0.014
Number of Observations	391	382	401			
U.S. High Cost Treatment						
	$100k	**$200k**	**$300k**	**$100k-$200k**	**$100k-$300k**	**$200k-$300k**
Bank Tax Opinion	0.569	0.610	0.636	-0.041	-0.067	-0.026
	(0.023)	(0.025)	(0.025)	(0.034)	(0.034)	(0.035)
				0.224	0.048	0.459
Number of Observations	450	390	382			
France Low Cost Treatment						
	€100k	**€200k**	**€300k**	**€100k-€200k**	**€100k-€300k**	**€200k-€300k**
Bank Tax Opinion	0.754	0.711	0.695	0.042	0.058	0.016
	(0.021)	(0.025)	(0.024)	(0.032)	(0.032)	(0.034)
				0.192	0.070	0.641
Number of Observations	418	343	361			
France High Cost Treatment						
	€100k	**€200k**	**€300k**	**€100k-€200k**	**€100k-€300k**	**€200k-€300k**
Bank Tax Opinion	0.741	0.673	0.649	0.068	0.092	0.024
	(0.024)	(0.025)	(0.027)	(0.034)	(0.036)	(0.036)
				0.046	0.010	0.508
Number of Observations	340	367	322			

Table A-9: Estimated Effect of Income Threshold on Support for New Tax on Banking Incomes—United States and France. Columns 1-3 report mean estimates for *Bank Tax Opinion* by treatment category and the standard error of the estimate in parentheses. Columns 4-6 report difference-in-means tests, the standard error in parentheses, and p-value assuming unequal variances. The top panel reports these quantities under the "Low Cost" treatment and the bottom panel reports these quantities under the "High Cost" treatment. Respondents working in the financial sector are not included in these estimates.

unlike the trade question the treatment is a threshold and the bank tax applies to all banking incomes above the threshold. As such, the threshold underestimates the income of the average banker likely to be affected by the policy. This means that many respondents with incomes higher than the threshold may view the tax as primarily a policy that would lower incomes of bankers who are not so different from themselves or who are even better off than they are. In contrast, the experiment is well suited for estimating the impact of disadvantageous inequality on opinion formation as the the treatments vary the relative income of those likely to be harmed by the policy without directly impacting the incomes of the respondents.

The dependent variable is *Bank Tax Opinion* The initial estimating equation is:

$$P(Y = 1) = \Phi(\phi_0 + \alpha(w_j - w_i)) \tag{11}$$

and is estimated as a probit model. *Disadvantageous Inequality* is defined as in the other experiments except that the "other" income level is determined by the treatments for the bank tax experiment. The key hypothesis is that $\alpha > 0$ because a new tax on banking incomes will lower the after-tax returns to bankers with salaries over the threshold defined by the treatment and to the extent that respondents exhibit disadvantageous inequality aversion in their preferences, lowering these bankers' incomes increases the utility of individuals who have lower incomes than the threshold. Further, recall that the new banking tax experiment was conducted under both a "Low Cost" and "High Cost" frame. We report the separate estimates of the disadvantageous inequality parameter for each condition. Finally, we report each set of results with a specification based on the theoretical model only (Models 1 and 3) and a specification with additional demographic control variables (Models 2 and 4).

Table A-10 reports the main results for the new tax on banking incomes in the United States. We start by focusing on the results for the "Low Cost" prime. The estimates for Model 1 are for the initial specification. The coefficient estimate for the *Disadvantageous Inequality* parameter is positive as predicted and statistically significant. The results for the

	Probit Model Estimates			
	Low Cost		High Cost	
	Model 1	**Model 2**	**Model 3**	**Model 4**
	Coefficient Estimates	**Coefficient Estimates**	**Coefficient Estimates**	**Coefficient Estimates**
Disadvantageous Inequality, α	0.0022	0.0022	0.0014	0.0007
	(0.0004)	(0.0005)	(0.0004)	(0.0005)
	0.000	0.000	0.001	0.123
Demographic Controls	No	Yes	No	Yes
State Fixed Effects	No	Yes	No	Yes
Log-likelihood	-753.2	-710.4	-812.3	-755.5
Observations	1,171	1,134	1,218	1,184

Table A-10: Support for a Banking Income Tax—United States, Probit Estimates. The table reports the results of probit regressions for the variable *Bank Tax Opinion* on *Disadvantageous Inequality*, and various control variables. For each model, the table reports the probit coefficient estimates for each variable, their heteroskedastic-consistent robust standard errors in parentheses, and p-values. A constant term is included in each regression but not reported in the table.

	Probit Model Estimates			
	Low Cost		High Cost	
	Model 1	**Model 2**	**Model 3**	**Model 4**
	Coefficient Estimates	**Coefficient Estimates**	**Coefficient Estimates**	**Coefficient Estimates**
Disadvantageous Inequality, α	-0.0097	-0.0095	-0.0132	-0.0139
	(0.0057)	(0.0060)	(0.0059)	(0.0061)
	0.088	0.110	0.025	0.023
Demographic Controls	No	Yes	No	Yes
Log-likelihood	-655.6	-614.3	-632.3	-606.8
Observations	1,115	1,088	1,023	1,007

Table A-11: Support for a Banking Income Tax—France, Probit Estimates. The table reports the results of probit regressions for the variable *Bank Tax Opinion* on *Disadvantageous Inequality*, and various control variables. For each model, the table reports the probit coefficient estimates for each variable, their heteroskedastic-consistent robust standard errors in parentheses, and p-values. A constant term is included in each regression but not reported in the table.

Model 2 specification including additional control variables indicate that the estimate for the *Disadvantageous Inequality* parameter is again positive as predicted and statistically and substantively significant. This indicates that, all else equal, individuals are more supportive of a new bank tax, the greater the difference between a respondent's own income and the threshold of the banking incomes on which the tax will be applied. Interestingly, the role of *Disadvantageous Inequality* appears to be conditional on how costly the policy is. The Model 4 estimates under the "High Cost" condition is positive but smaller in magnitude and not statistically significant once the controls are added. Overall, the estimates suggest that inequality aversion generally may influence policy preferences but there are limits to how willing individuals are to incur costs to create equality.

Table A-11 reports the main results for the new tax on banking incomes in France. Not surprisingly given the pattern of mean estimates presented in Table A-9, the estimates of the disadvantageous inequality parameter are inconsistent with our model's predictions. The estimates are negative across all four specifications and statistically significant in the high cost condition. As discussed above, this result is a departure from the generally consistent pattern of results across our experiments and may be due to the generally high level of incomes across all the treatment categories and/or particular features of the policy debate about European banking regulation at the time.

Main Empirical Specifications with Additional Control Variables

	Probit Model Estimates			
	U.S.	**U.S.**	**France**	**France**
	Model 1	**Model 2**	**Model 3**	**Model 4**
	Coefficient Estimates	**Coefficient Estimates**	**Coefficient Estimates**	**Coefficient Estimates**
Disadvantageous Inequality, α	0.0072	0.0074	0.1030	0.1025
	(0.0001)	(0.0010)	(0.0099)	(0.0100)
	0.000	0.000	0.000	0.000
Advantageous Inequality, β	0.0012	0.0004	0.0656	0.0645
	(0.0018)	(0.0020)	(0.0248)	(0.0249)
	0.512	0.854	0.008	0.010
Personal Income Greater, ϕ_1	-0.4982	-0.5076	-0.8322	-0.8280
	(0.1121)	(0.1273)	(0.1119)	(0.1126)
	0.000	0.000	0.000	0.000
Demographic Controls	Yes	Yes	Yes	Yes
Additional Demographic Controls	Yes	Yes	Yes	Yes
Political Ideology Controls	No	Yes	No	Yes
State Fixed Effects	Yes	Yes	No	No
Log-likelihood	-1488.3	-1095.0	-1292.5	-1284.3
Observations	2,411	1,942	2,118	2,106

Table A-12: Support for Income Tax Increases to Reduce Budget Deficit—United States and France, Probit Estimates. The table reports the results of probit regressions for the variable *Income Tax Opinion* on *Disadvantageous Inequality*, *Advantageous Inequality*, and various control variables. For each model, the table reports the probit coefficient estimates for each variable, their heteroskedastic-consistent robust standard errors in parentheses, and p-values. A constant term is included in each regression but not reported in the table. Additional demographic controls include marital status, black, latino for the United States models, as well as marital status and whether self-perceived as ethnic minority for the France models. Political ideology controls include liberal-conservative ideology and partisanship for the United States models, as well as left-right ideology for the France models.

	Probit Model Estimates			
	U.S.	**U.S.**	**France**	**France**
	Model 1	**Model 2**	**Model 3**	**Model 4**
	Coefficient Estimates	**Coefficient Estimates**	**Coefficient Estimates**	**Coefficient Estimates**
Disadvantageous Inequality, α	0.0074	0.0083	0.1400	0.1417
	(0.0009)	(0.0011)	(0.0103)	(0.0104)
	0.000	0.000	0.000	0.000
Advantageous Inequality, β	0.0015	0.0019	0.0459	0.0500
	(0.0018)	(0.0020)	(0.0252)	(0.0252)
	0.408	0.343	0.068	0.048
Personal Income Greater, ϕ_1	-0.3826	-0.3752	-0.4526	-0.4367
	(0.1102)	(0.1241)	(0.1060)	(0.1077)
	0.001	0.002	0.000	0.000
Demographic Controls	Yes	Yes	Yes	Yes
Additional Demographic Controls	Yes	Yes	Yes	Yes
Political Ideology Controls	No	Yes	No	Yes
State Fixed Effects	Yes	Yes	No	No
Log-likelihood	-1505.5	-1123.2	-1275.1	-1248.1
Observations	2,422	1,949	2,118	2,106

Table A-13: Support for Progressive Income Tax—United States and France, Probit Estimates. The table reports the results of probit regressions for the variable *Progressive Tax Opinion* on *Disadvantageous Inequality*, *Advantageous Inequality*, and various control variables. For each model, the table reports the probit coefficient estimates for each variable, their heteroskedastic-consistent robust standard errors in parentheses, and p-values. A constant term is included in each regression but not reported in the table. Additional demographic controls include marital status, black, latino for the United States models, as well as marital status and whether self-perceived as ethnic minority for the France models. Political ideology controls include liberal-conservative ideology and partisanship for the United States models, as well as left-right ideology for the France models.