Online Appendix for Self-Centered Inequity Aversion and the Mass Politics of Taxation

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July 2016

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 **??** and **??**.

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:

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

$T(i)$ 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.

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:

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

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 $\alpha > \beta > 0$, 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:[1]

Based on the general utility function in Eq(A-2), 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:

[1] 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.

Online Sampling Procedures, Instrument Details, and Descriptive Statistics

All the main analyses reported in this article are from original surveys conducted in 2010. The surveys were conducted over the internet by Qualtrics, `www.qualtrics.com`, using their online samples.[2] The design was reviewed and granted an exemption by Yale University's Human Subjects Review Committee. The exact dates that data were collected were from October 5, 2010 to December 20, 2010 in France and July 9, 2010 to August 18, 2010 in the United States. The sample in each country is a quota sample with quotas set to primarily 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) but with quotas also set for sex, age, education, and income. We prioritized the quotas for 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. Given the number of dimensions that we consider in the selection of respondents, there is a significant difference between the total attempted cases and the number of final respondents who were accepted in the quota and completed the survey. In France, 29,947 respondents provided their basic demographic information, but only 2,175 respondents completed the survey. In the United States, 14,169 respondents provided demographic information, and 2,487 respondents completed the survey. The original target sample size was 2,000 for each country. The resulting samples are representative on employment status which was the prioritized quota and broadly representative of the adult populations on other observed characteristics.[3] They are not, however, random samples. As such, our analyses either

[2]For details about the recruitment procedures used by Qualtrics, please see *Qualtrics ESOMAR 28 Questions*, http://success.qualtrics.com/rs/qualtrics/images/ESOMAR%2028%202014.pdf.

[3]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 tables below for descriptive

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.

The survey instrument for both countries was structured to minimize the possibility of contamination across experiments. The instrument started with questions about the characteristics that we used as considerations in the quota sampling. Once selected respondents began the full survey, the various survey experiments were presented and were randomly rotated to avoid contamination. The survey instrument ended with additional demographic and political opinion questions.

	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.

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 Codings of Policy Preference Responses

In this section, we report the results of our two experiments using alternative codings of the dependent variables from each experiment. *Income Tax Opinion 2* 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. *Progressive Tax Opinion 2* 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.

	Mean Estimates by Treatment Category			Difference Estimates		
United States						
	$40k	**$80k**	**$125k**	**$40k-$80k**	**$40k-$125k**	**$80k-$125k**
Income Tax Opinion 2	1.791	2.494	2.684	-0.703	-0.894	-0.191
Full sample (n=2,487)	(0.038)	(0.041)	(0.043)	(0.055)	(0.057)	(0.059)
				0.000	0.000	0.001
Income Tax Opinion 2	1.970	2.735	2.886	-0.765	-0.916	-0.151
Less Than $40K Sample (n=1,253)	(0.053)	(0.057)	(0.060)	(0.078)	(0.080)	(0.083)
				0.000	0.000	0.069
Income Tax Opinion 2	1.745	1.714	2.169	0.030	-0.425	-0.454
Greater Than $125K Sample (n=168)	(0.153)	(0.139)	(0.162)	(0.207)	(0.223)	(0.213)
				0.883	0.060	0.035
France						
	€2.1k	**€4.2k**	**€10k**	**€2.1k-€4.2k**	**€2.1k-€10k**	**€4.2k-€10k**
Income Tax Opinion 2	1.838	2.871	3.058	-1.033	-1.220	-0.187
Full Sample (n=2,170)	(0.040)	(0.043)	(0.043)	(0.059)	(0.059)	(0.060)
				0.000	0.000	0.002
Income Tax Opinion 2	1.969	3.002	3.066	-1.033	-1.097	-0.064
Less Than €2.1K Sample (n=1,345)	(0.053)	(0.050)	(0.055)	(0.073)	(0.077)	(0.074)
				0.000	0.000	0.393
Income Tax Opinion 2	1.842	2.227	2.636	-0.385	-0.794	-0.409
Greater Than €10K Sample (n=63)	(0.268)	(0.271)	(0.283)	(0.381)	(0.390)	(0.392)
				0.318	0.049	0.303

Table A-5: 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 2* 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.

	Ordered 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	0.0075	0.0076	0.0979	0.0998
	(0.0007)	(0.0008)	(0.0086)	(0.0086)
	0.000	0.000	0.000	0.000
Advantageous Inequality, β	0.0012	0.0015	0.0518	0.0656
	(0.0015)	(0.0015)	(0.0218)	(0.0222)
	0.418	0.332	0.017	0.003
Personal Income Greater, ϕ_1	-0.5181	-0.5537	-0.6858	-0.7641
	(0.0917)	(0.0948)	(0.0943)	(0.0969)
	0.000	0.000	0.000	0.000
Demographic Controls	No	Yes	No	Yes
State Fixed Effects	No	Yes	No	No
Log-likelihood	-3114.2	-3005.3	-2672.2	-2609.3
Observations	2,475	2,425	2,157	2,115

Table A-6: Support for Income Tax Increases to Reduce Budget Deficit—United States and France, Probit Estimates. The table reports the results of ordered probit regressions for the variable *Income Tax Opinion 2* on *Disadvantageous Inequality*, *Advantageous Inequality*, and various control variables. For each model, the table reports the ordered probit coefficient estimates for each variable, their heteroskedastic-consistent robust standard errors in parentheses, and p-values. The estimates of cut points are included in each regression but not reported in the table.

	Mean Estimates by Treatment Category			Difference Estimates		
United States						
	$40k	**$80k**	**$125k**	**$40k-$80k**	**$40k-$125k**	**$80k-$125k**
Progressive Tax Opinion 2	3.188	3.510	3.686	-0.322	-0.498	-0.176
Full sample (n=2,483)	(0.022)	(0.025)	(0.027)	(0.034)	(0.035)	(0.037)
				0.000	0.000	0.000
Progressive Tax Opinion 2	3.270	3.643	3.782	-0.373	-0.513	-0.140
Less Than $40K Sample (n=1,251)	(0.032)	(0.038)	(0.039)	(0.049)	(0.050)	(0.054)
				0.000	0.000	0.010
Progressive Tax Opinion 2	3.229	3.344	3.305	-0.115	-0.076	.0391
Greater Than $125K Sample (n=168)	(0.104)	(0.081)	(0.077)	(0.132)	(0.130)	(0.112)
				0.384	0.560	0.727
France						
	€2.1k	**€4.2k**	**€10k**	**€2.1k-€4.2k**	**€2.1k-€10k**	**€4.2k-€10k**
Progressive Tax Opinion 2	3.172	3.835	4.193	-0.662	-1.020	-0.358
Full sample (n=2,171)	(0.030)	(0.031)	(0.030)	(0.043)	(0.043)	(0.044)
				0.000	0.000	0.000
Progressive Tax Opinion 2	3.224	3.961	4.243	-0.737	-1.018	-0.282
Less Than €2.1K Sample (n=1,347)	(0.037)	(0.038)	(0.038)	(0.053)	(0.053)	(0.054)
				0.000	0.000	0.000
Progressive Tax Opinion 2	3.000	3.667	4.042	-0.667	-1.042	-0.375
Greater Than €10K Sample (n=62)	(0.271)	(0.174)	(0.195)	(0.322)	(0.334)	(0.261)
				0.048	0.039	0.158

Table A-7: 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 2* 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.

	Ordered 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	0.0070	0.0073	0.1396	0.1414
	(0.0007)	(0.0008)	(0.0085)	(0.0086)
	0.000	0.000	0.000	0.000
Advantageous Inequality, β	0.0012	0.0012	0.0300	0.0391
	(0.0014)	(0.0014)	(0.0239)	(0.0235)
	0.404	0.414	0.210	0.096
Personal Income Greater, ϕ_1	-0.3387	-0.3354	-0.2758	-0.3112
	(0.0867)	(0.0892)	(0.0848)	(0.0868)
	0.000	0.000	0.001	0.000
Demographic Controls	No	Yes	No	Yes
State Fixed Effects	No	Yes	No	No
Log-likelihood	-2488.4	-2417.9	-2473.6	-2414.6
Observations	2,477	2,427	2,159	2,115

Table A-8: Support for Progressive Income Tax—United States and France, Ordered Probit Estimates. The table reports the results of ordered probit regressions for the variable *Progressive Tax Opinion 2* 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. The estimates of cut points are included in each regression but not reported in the table.

	OLS Estimates of Difference among Treatment Groups		
United States			
	$40k-$80k	**$40k-$125k**	**$80k-$125k**
Income Tax Opinion	-0.259	-0.329	-0.069
Full sample (n=2,487)	(0.023)	(0.023)	(0.024)
	0.000	0.000	0.004
Income Tax Opinion	-0.286	-0.331	-0.040
Less Than $40K Sample (n=1,253)	(0.033)	(0.032)	(0.034)
	0.000	0.000	0.239
Income Tax Opinion	0.038	-0.193	-0.207
Greater Than $125K Sample (n=168)	(0.085)	(0.090)	(0.084)
	0.659	0.035	0.016
France			
	€2.1k-€4.2k	**€2.1k-€10k**	**€4.2k-€10k**
Income Tax Opinion	-0.399	-0.455	-0.054
Full Sample (n=2,175)	(0.025)	(0.024)	(0.024)
	0.000	0.000	0.023
Income Tax Opinion	-0.403	-0.402	-0.001
Less Than €2.1K Sample (n=1,348)	(0.031)	(0.031)	(0.029)
	0.000	0.000	0.959
Income Tax Opinion	-0.178	-0.384	-0.047
Greater Than €10K Sample (n=63)	(0.185)	(0.143)	(0.170)
	0.340	0.011	0.783

Table A-9: Estimated Effect of Income Threshold on Support for Income Tax Increases to Reduce the Deficit—United States and France. Columns 1-3 report estimates of difference across treatment categories after controlling sex, age, and education, the robust standard error in parentheses, and p-value.

Main Experimental Results Controlling for Age, Sex, and Education

This section replicates Tables 3 and 4 but controls for age, sex, and education.

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

	OLS Estimates of Difference among Treatment Groups		
United States			
	$40k-$80k	**$40k-$125k**	**$80k-$125k**
Progressive Tax Opinion	-0.191	-0.308	-0.117
Full sample (n=2,487)	(0.023)	(0.023)	(0.024)
	0.000	0.000	0.000
Progressive Tax Opinion	-0.218	-0.311	-0.096
Less Than $40K Sample (n=1,253)	(0.033)	(0.033)	(0.034)
	0.000	0.000	0.005
Progressive Tax Opinion	-0.058	-0.028	0.010
Greater Than $125K Sample (n=168)	(0.092)	(0.092)	(0.088)
	0.527	0.762	0.910
France			
	€2.1k-€4.2k	**€2.1k-€10k**	**€4.2k-€10k**
Progressive Tax Opinion	-0.369	-0.502	-0.132
Full Sample (n=2,175)	(0.025)	(0.023)	(0.024)
	0.000	0.000	0.000
Progressive Tax Opinion	-0.403	-0.498	-0.096
Less Than €2.1K Sample (n=1,348)	(0.031)	(0.029)	(0.029)
	0.000	0.000	0.001
Progressive Tax Opinion	-0.298	-0.487	-0.192
Greater Than €10K Sample (n=63)	(0.163)	(0.155)	(0.150)
	0.076	0.003	0.209

Table A-10: Estimated Effect of Income Threshold on Support for Progressive Income Tax—United States and France. Columns 1-3 report estimates of difference across treatment categories after controlling sex, age, and education, the robust standard error in parentheses, and p-value.

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:

$$P(Y = 1) = \Phi(\phi_0 + \phi_1 \textit{Personal Income Greater} - \alpha[\max\{w_j - (w_i + Z), 0\}] - \beta[\max\{w_i - (w_j + Z), 0\}]) \tag{A-3}$$

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-11 below reports the test statistics.

For the deficit reduction experiment, Table A-11 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 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

	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-11: 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.

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 inequity 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 (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.[4] 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.[5] 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 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

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

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

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.[6] 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.[7] This ratio of two-to-one against new sector-specific trade barriers contrasts with responses to more general trade 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

[6]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.

[7]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.

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.[8]

Table A-12 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.[9]

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).[10] The specification is:

$$P(Y = 1) = \Phi(\phi_0 + \alpha Disadvantageous\ Inequality + \beta Advantageous\ Inequality) \quad \text{(A-4)}$$

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 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

[8]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.

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

[10]See Lü, Scheve, and 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-12: 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.

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-13 and A-14.

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

	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-13: 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-14: 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.

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.[11] 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 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

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

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.[12] 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.[13]

Table A-15 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.

The income threshold treatments in the United States follow the same pattern as the other experiments discussed in the article. 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

[12]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.

[13]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.

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 article. 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 article.

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, 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

	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-15: 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.

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:

$$P(Y = 1) = \Phi(\phi_0 + \alpha(w_j - w_i)) \tag{A-5}$$

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-16 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 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

	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	0.0005
	(0.0004)	(0.0005)	(0.0004)	(0.0005)
	0.000	0.000	0.001	0.331
Demographic Controls	No	Yes	No	Yes
State Fixed Effects	No	Yes	No	Yes
Log-likelihood	-753.2	-710.4	-812.3	-753.6
Observations	1,171	1,134	1,218	1,184

Table A-16: 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	-0.0160	-0.0139
	(0.0057)	(0.0060)	(0.0060)	(0.0061)
	0.088	0.110	0.008	0.023
Demographic Controls	No	Yes	No	Yes
Log-likelihood	-655.6	-614.3	-630.4	-606.8
Observations	1,115	1,088	1,023	1,007

Table A-17: 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.

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-17 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-15, 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 Econometric 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-18: 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-19: 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.

Paying for Equality

A simple observable 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 March 2014.

The survey was carried out online by YouGov. YouGov employs a carefully executed opt-in panel together with matched sampling to approximate a random sample of the adult population (Rivers 2011). Matched sampling involves taking a stratified random sample of the target population and then matching available internet respondents to the target sample. The variables included in determining the matched cases were gender, age, race, education, party identification, ideology, and political interest. YouGov interviewed 541 respondents who were then matched down to a sample of 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.

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?[14]

Table A-20 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 have a tax system that reduces self-centered inequality. 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 A-20 reports how strongly respondents gave these answers to justify their

[14]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.

	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 A-20: 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.

Plan B choices.[15] Overall, responses to these questions suggest a willingness of a significant portion of survey respondents to incur costs to themselves in order to select tax policies that reduce inequality.

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