

Envy and Altruism in Hard Times¹

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Abstract

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. This paper investigates how social preferences, specifically envy and altruism, influence individual policy opinions in these debates. I argue that social preferences have a powerful influence on support for policy alternatives which in turn shape the incentives faced by politicians in setting policy. I conduct original survey experiments in France and the United States and provide strong evidence that individuals care both about how economic policy alternatives affect their own interests and how they influence the welfare of others. Their concern about the welfare of others is consistent with inequality aversion—both envy and altruism. The analysis focuses on key policy areas in the response to the current international economic crisis: trade policy, financial sector regulation, and tax policy. This preliminary draft presents the results from the United States only as the French survey is in the field.

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 current economic crisis 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. These political debates have spurred everything from riots in Greece to tea parties in the United States.

The political economic logic that informs these debates and ultimately the policies implemented is complex and varies in important ways according to the economic and political context of each country. Nonetheless, an essential element of many of these policy debates is distributive—they are about who gets what—and as such, can be explained and understood in light of a long tradition of scholarship on economic policymaking. This research focuses on identifying the determinants of preferences over policy alternatives by the relevant groups in society—e.g. voters, firms, interest groups, politicians, bureaucrats, and the media in a democratic setting—and the institutions that aggregate these preferences. This wide-ranging literature provides a host of insights about why different actors or groups in society advocate the policies that they do, why they make particular types of arguments, and why they succeed or fail at getting what they want. Of particular relevance for understanding the political debate of policymaking in democracies during economic crises is the policy opinions of individual citizens. Whether or not these opinions ultimately determine the policies chosen, the opinions of voters and the sources of these opinions shape the strategies of all the other actors in the political process.

This paper investigates how social preferences, or other-regarding preferences, influence individual policy opinions about economic policymaking in the context of an economic cri-

sis. Building on previous research and focusing on trade, tax policy, and financial market regulation, I argue that individual preferences over economic policies are shaped by considerations of others, above and beyond the effect of these policies on one's own income. A growing literature has explored theoretically and empirically the possibility that individuals may have "other-regarding" preferences.¹ One important approach assumes that individual utility functions depend not only on the individual's own material payoff but also on the material payoffs that others receive. These interdependent, social preferences could include everything from altruism, for which utility increases with the well being of other people, to spitefulness, for which utility decreases in the well being of others.

The theoretical framework that I develop in this paper for explaining how social preferences influence economic policy opinions emphasizes the form of social preferences known as "inequity aversion," in which 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). I argue theoretically that individual attitudes about inequality—both envy and altruism—lead to systematic differences in support for trade protection across different sectors of the economy, in support for taxing banking incomes, and in support for higher income taxes to help reduce the budget deficit. In each policy domain, individuals not only consider how policy alternatives affect their own interests but also how they affect the incomes of others relative to their own. This argument obviously relates to previous research on inequality aversion but it also is relevant to previous research on the importance of fairness concerns in redistributive policymaking. Inequality aversion as conceptualized here is essentially a specific definition of what counts as a fair policy alternative in terms of granting resources to some citizens or taking resources from others.²

¹For reviews, see Sobel (2005), Fehr and Schmidt (2006), Levitt and List (2007), and DellaVigna (2009).

²See Alesina and Giuliano (2009) for a recent review of research on preferences over redistribution. See also Bartels (2008, especially Chapter 5) for a comprehensive analysis of egalitarian values in the United States. Previous research on the role of fairness has typically focused on how beliefs about the sources of income—e.g. hard work and effort versus luck and connections—influence assessments of the fairness of policy alternatives about redistribution (e.g. Alesina and Angeletos (2005)). Scheve and Stasavage (2010) argue that historically mobilization for mass warfare has had a substantial impact on the perceived fairness of and support for progressive taxation.

The main objective of the paper is to evaluate empirically the role of inequality aversion in opinion formation about economic policies in the context of the current financial crisis. To do this, I conduct original survey experiments on national samples of individuals in France (survey in the field and thus not included in this draft) and the United States. I pursue two different types of empirical strategies in the analysis. First, I evaluate experimentally how variation in the incomes of the beneficiaries of various policies influence support for those policies. I show that opinions about trade, financial market regulation, and 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, I adopt a specific formalization of inequality aversion, incorporate this utility function into standard models of policymaking, and estimate structurally an equation of policy preferences. I find that individuals have the social preferences of altruism and envy assumed in these models though the relative importance of these motivations vary across issue areas. Econometrically identifying these preferences lends considerable support to the main claim of this paper that envy and altruism play a central role in distributive political conflict over economic policies during times of economic crises.

The estimates in this paper indicate that support for sector-specific trade protection in the United States depends on both altruism and envy. For example, in the analysis of trade-policy opinions, increasing the measure of altruism (the gap by which a respondent's income exceeds the income of the typical worker in the sector being considered for increased trade protection) by two standard deviations raises the probability that respondents support trade protection by 13 percentage points (about a 37% increase). Similarly, increasing the measure of envy (the gap by which a respondent's income lies below the income of the typical worker in the sector being considered for increased trade protection) by two standard deviations, lowers the probability that respondents support trade protection by 14 percentage points (about a 40% decrease). The equivalent quantities in the analysis of support for increases in the income

tax in order to help lower the deficit were also substantively important. Increasing the envy measure by two standard deviations, raises the probability that respondents support higher income taxes by 24 percentage points (about a 50% increase) while increases in the altruism measure by two standard deviations lowers the probability that respondents support higher income taxes by 15 percentage points (about a 32% change). Similar results for envy, though not altruism, are reported for policy opinions about taxing high banking incomes. Overall, the analysis finds substantial evidence that U.S. respondents exhibit inequity aversion in their preferences over economic policy.

The paper contributes to the existing literature on economic policy preferences in at least three ways. First, most previous research on economic policy opinions that emphasizes other regarding preferences focuses on altruism rather than envy.³ This paper suggests that both factors are important determinants of policy opinions. Second, previous research has for the most part focused on particular ways in which other regarding preferences might influence a specific policy issue while this paper adopts a common framework for understanding the role of other-regarding preferences in the determination of economic policy preferences.⁴ Third, the evidence in the existing literature on other-regarding preferences and public opinion about economic policies is largely based 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.⁵ The survey experiments conducted here follow closely from the specific theoretical accounts of envy and altruism that are claimed to be important for opinion formation and allow for a clearer identification of the influence

³See discussion in Alesina and Giuliano's (2009) review and in recent research such as Rueda and Pontusson (2010), but also see Bartels (2008, Chapter 5) for an exception.

⁴The area of economic policymaking that has most seriously considered a role for other-regarding preferences is redistributive policymaking. See, for example, Luttmer (2001), Alesina and Glaeser (2004), Bartels (2008), and Rueda and Pontusson (2010). Work in other policy domains is less common but see Mansfield and Mutz (2009) and Lu, Scheve, and Slaughter (2010) on trade policy.

⁵Again, this characterization is clearest for the literature on preferences about redistribution for which the most research on other-regarding preferences has been conducted. A typical empirical analysis in this literature might regress a measure of support for redistributive policies on an attitude measure such as left ideology or a general measure of psychological orientation and conclude that the partial correlation between these measures is evidence of altruism. Examples of indirect evidence include studies which note differences in opinion support across sex or racial categories and infer differences in altruism.

of other-regarding preferences.

The rest of the paper is organized as follows. In Section 2, I present a summary of the main argument and outline the theoretical framework which informs the empirical work. Section 3 describes the survey and the design of the experiments, reports the basic experimental treatment effects, and finally presents the analysis estimating the influence of envy and altruism on opinion formation. Section 4 offers some concluding remarks.

2 Social Concerns and Economic Policymaking

In June 2010, the United Kingdom like many countries around the world faced a massive budget deficit as a consequence of the financial crisis. At this time and in the context of volatile European financial markets reacting to severe fiscal problems across Europe, a new Conservative and Liberal Democratic coalition government announced an emergency budget. George Osborne, the Conservative Chancellor of the Exchequer, presented a memorable budget not just for the aggressiveness with which it attacked the UK's budget deficit but for its insistence that the budget should be and was fair in terms of the distribution of the costs of reducing the deficit and in terms of protecting the most vulnerable. The Chancellor used some form of the word "fair" fourteen times in the budget speech and more often than not the meaning of fairness in the speech was that all citizens would suffer in terms of decreased benefits and higher taxes but that the rich would disproportionately sacrifice to create a more sustainable budget. In the Chancellor's words ending the speech "The richest paying the most and the vulnerable protected. That is our approach. Prosperity for all. That is our goal."⁶ This speech and much of the summer's political debate about fiscal policy in the UK is an example of how ideas about distributional fairness, often essentially ideas about inequality, can shape political preferences and debate about economic policymaking, particularly in the context of economic crises.⁷

⁶See full text at http://www.hm-treasury.gov.uk/junebudget_speech.htm.

⁷It is worth noting that the non-partisan Institute for Fiscal Studies, the leading tax think tank in the UK, issued a report at the end of the summer 2010 examining the Government's claims about the budget's

This paper argues that this speech and so many like it are indicative of a preference among voters for equality as well as policies that improve individual welfare. A growing literature has explored theoretically and empirically the possibility that some individuals may have other regarding preferences. Sobel (2005), Fehr and Schmidt (2006), and DellaVigna (2009) provide reviews of the empirical evidence of these preferences and various theoretical frameworks for understanding this evidence. One significant approach in this literature is models of social preferences which assume that individual utility functions depend not only on the individual's own material payoff but also on the material payoffs that others receive. The main idea is that individuals maximize their utility as they would in more conventional self-interested models but they do not solely care about their own material outcomes. These social preferences could include everything from altruism, for which utility increases with the well being of other people, to spitefulness, for which utility decreases in the well being of others.

One influential form of social preference in this literature is inequity aversion. Fehr and Schmidt (1999), for example, posit 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. They propose a simple utility function to capture this idea and argue that it is consistent with behavior commonly observed in a wide variety of experimental social interactions such as dictator games, ultimatum games, trust games, public good games, punishment games, and gift exchange games.⁸ 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 social interactions.

In this paper, I apply the idea of inequality aversion to the explanation of policy opinions about trade, the taxation of banking incomes, and income tax increases in order to balance

distributional consequences and conclusively proclaimed the new policies to be “clearly regressive”. This assessment has led to ongoing debate about the fairness of the government's policies. The point of the speech and the debate for our purposes is simply that the government felt compelled to say that the budget should be distributionally fair and claim that its proposals actually were.

⁸See Charness and Rabin (2002) for an important related alternative formalization of social preferences and Sobel (2005) for a more general review.

the budget. The appendix presents a complete formal model of preferences for trade policy (and will in the next draft do so for the other policy areas) and this section simply outlines the general theoretical approach that informs the empirical work.

For each policy area, individuals are assumed to have a utility function of the following general form:

$$u_i = x_0 + \sum_{l=1}^n u_i(x_l) - \frac{\alpha}{n-1} \sum_{i \neq j} \max\{I_j - I_i, 0\} - \frac{\beta}{n-1} \sum_{i \neq j} \max\{I_i - I_j, 0\} \quad (1)$$

This utility function has two components: utility from consumption ($x_0 + \sum_{l=1}^n u_i(x_l)$) and disutility from inequality aversion ($-\frac{\alpha}{n-1} \sum_{i \neq j} \max\{I_j - I_i, 0\} - \frac{\beta}{n-1} \sum_{i \neq j} \max\{I_i - I_j, 0\}$). Goods are indexed by l and individuals are indexed by i . x_0 is the consumption of the numeraire good 0 and x_l is the consumption of non-numeraire good l . The utility functions $u_i(\cdot)$ are increasing functions which are differentiable, separable, and strictly concave. Since I assume that individuals consume their entire income (I_i), it is helpful to think about utility from consumption essentially being utility from own income I_i . The term for inequality aversion is same as the specification in Equation (1) in Fehr and Schmidt (1999: 822). In particular, Fehr and Schmidt specify one parameter (β) for "altruism" when $I_i > I_{-i}$, and the other parameter for "envy" (α) when $I_i < I_{-i}$. This specification of the utility function implies that an individual would feel altruistic to those who earn less than him/her, and feel envious to those who earn more at the same time. Consequently, in thinking about the determinants of policy preferences in this framework, the central questions are how do the policy alternatives influence an individual's own income I_i and how do they affect the income of everyone else in society I_j .

For trade policy, I adopt a standard economic environment in which individuals earn a return to their labor and a sector-specific skill or factor with which they are endowed, there is an exogenous world price for each good, and more protectionist trade policies raise

domestic prices relative to the world price and in doing so the returns to those individuals with sector-specific skills in that sector. As in the standard model, trade protection in one's own sector makes one better off by increasing one's own income while trade protection in other sectors makes one worse off by raising the prices of the goods one consumes. The focus is on what policy opinions individuals have about trade protection in other sectors and so the key departure from the standard model is that because individuals are inequality averse, their preferences over sector-specific trade barriers are sensitive to the income levels in a given sector. If for example, I earn more than the average worker in a given sector, trade protection that raises the income of workers in that sector is, all else equal, welfare improving for me—the altruism effect. If, on the other hand, I earn less than the average worker in a given sector, trade protection not only makes me worse off as a consumer but it makes me worse off because the policy raises the income of someone already better off than I—the envy effect.

The theoretical framework for the analysis of a new tax on banking incomes and an increase in the income tax to balance the budget follows this same logic. Each policy alternative for these issues may affect an individual's own income and the income of others. Setting aside the effect of the policy on an individual's own income, the expectation is that there is a preference for policies that equalize income generally and more specifically that individuals will be more (less) willing to subsidize (reduce) the income of those who earn less than they do—that is, they will exhibit altruism in their policy opinions—and less (more) willing to subsidize (reduce) the incomes of those who make more than they do—that is, they will exhibit envy in their policy opinions. The key goal of the empirical work is to evaluate the hypotheses that altruism and envy influence policy opinions in these three areas of economic policymaking.

3 Envy and Altruism in Economic Policy Preferences

In this section I use a national sample of individuals in the United States (French data analysis in process) to provide a series of diverse empirical tests for evaluating the importance of inequality aversion in opinion formation about economic policies. I pursue two different types of empirical strategies in the analysis. First, I evaluate experimentally how variation in the incomes of the beneficiaries of various policies influence support for those policies. I show that opinions about trade, financial market regulation, and 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, I adopt a specific formalization of inequality aversion, incorporate this utility function into standard models of policymaking, and estimate structurally an equation of policy preferences. I find that individuals have the social preferences of altruism and envy assumed in these models though the relative importance of these motivations vary across issue areas.

3.1 Experimental Design

The empirical analysis is based on evidence from an original survey conducted in July and August of 2010. The survey was conducted over the internet for a national sample of the U.S. adult population with 2,485 respondents.⁹ The sample is a quota sample with quotas set to target the U.S. adult population for employment status (working as an employee, working self-employed, not working looking for a job, not working retired, not working disabled, not working student, not working other). The sample is representative on the matched characteristics and broadly representative of the U.S. adult population on other observed characteristics such as sex, age, education, and income (see appendix for descriptive statistics), but it is not a random sample. As such, I will focus exclusively on analyses which

⁹The experiment was conducted by Qualtrics, www.qualtrics.com. The survey was reviewed and granted an exemption by Yale University's Human Subjects Review Committee.

take advantage of the various survey experiments conducted rather than making descriptive inferences about the U.S. population. While it is possible that there are differential treatment effects for the participants in this survey and a random sample of the U.S. population, this seems unlikely to be the case.¹⁰ At the very least, the estimates reported here are analogous to a large-scale laboratory experiment with participants that broadly represent the U.S. population. This section describes three sets of experiments on trade policy, financial market regulation, and tax policy, which were conducted as part of the survey.¹¹

The first experiment investigates if individual policy preferences about sector-specific trade protection exhibit inequality aversion. To do this, I randomly assigned respondents to consider trade protection for industries with different wage levels and recorded their support for sector-specific trade protection.

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 18,000, 40,000, or 80,000 dollars per year.¹² These values were chosen so that respondents were considering trade protection for low, average, and high wage industries. The low value of \$18,000 corresponds to an income a bit higher than the total money income in 2007 for an adult who

¹⁰One 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 reported here is a replication of Lu, Scheve, and Slaughter (2010) which did use a random sample and the results across the two experiments are very similar.

¹¹The order of the experiments was randomly rotated to avoid contamination across experiments.

¹²We conducted several types of balance tests, each of which indicated that the observed characteristics of the respondents were balanced across treatment groups.

worked full-time, year-round at the 10th percentile in the income distribution.¹³ 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 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.¹⁴ 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, I will be able to use variation in the income of the workers likely to benefit to estimate separately the influence of envy and altruism 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 sample collected here is a quota

¹³The source for this data is the Current Population Survey, Annual Social and Economic Supplement, Table PINC-02.

¹⁴See the appendix 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.

sample and not meant for describing the U.S. population, just 33.8% of respondents favor new trade barriers while about two thirds of respondents are opposed.¹⁵ 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 anywhere from two-to-one support for further trade barriers to equal support and opposition to new barriers (see Scheve and Slaughter 2001b, Chapter 2). 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.

The second experiment investigates if individual policy preferences about special income taxes for workers in the banking industry exhibit inequality aversion.¹⁶ To do this, I randomly assigned respondents to consider the introduction of a new tax on banker incomes with different salaries at which the tax would apply. For this experiment, I 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 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

¹⁵Note that despite the caveat about the sample, the marginal responses to this question are quite similar to those reported in Lu, Scheve, and Slaughter (2010) which was a random sample of the U.S. population.

¹⁶I also conducted a related experiment on financial market regulation generally which will be discussed briefly below.

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.¹⁷ The values of Z were assigned randomly across respondents to be equal to 900 and 500 dollars. 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, I 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.¹⁸ Consequently, the experimental manipulation focuses on two dimensions, the income level of the category of individuals likely to be harmed by the tax and the costliness of the tax. The analysis will focus on evaluating how these two factors influence support for new taxes on banking incomes and again, I will be able to use variation in the income of the workers likely to be harmed by the tax to estimate separately the influence of envy and altruism on policy preferences. 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.

The third experiment investigates if individual policy preferences about increasing income taxes to decrease the budget deficit exhibit inequality aversion. To do this, I randomly assigned respondents to consider tax increases at different income levels.

¹⁷We conducted several types of balance tests, each of which indicated that the observed characteristics of the respondents were balanced across treatment groups.

¹⁸For example, this would be the case if the main beneficiary of the transfer is the next generation of tax payers. We 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.

The question used to elicit support for tax increases was:¹⁹

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.²⁰ These values were chosen so that respondents were considering tax increases for average, high, and very high earners. In each case, the assumption is that the additional revenue collected is used to reduce the deficit. For this experiment, it is not, however, plausible to assume that the policy proposal does not affect the incomes of some respondents directly. Obviously, if an individual respondent is in the income category for which the tax will apply, they will be directly affected by the tax as well. Nonetheless, the analysis will examine how both self-interest and other-regarding preferences influence policy opinions about tax increases. Average support for such a tax increase in our sample was 46.8%.

3.2 Experimental Results

The first set of empirical results report the basic findings from the three experiments. For each policy area, I am interested in estimating the effect of variation in the assumed income of the individual affected by the policy proposal on support for that policy.

¹⁹I also conducted a closely related but somewhat simpler experiment asking respondents whether individuals earning more than some treatment threshold of income should pay a greater, equal, or lesser share of their income in taxes. The results of this experiment were very similar to those reported here for the income tax increase and deficit reduction experiment.

²⁰We conducted several types of balance tests, each of which indicated that the observed characteristics of the respondents were balanced across treatment groups.

For the trade policy experiment, I constructed two measures of support for new trade barriers based on responses to the trade policy question. *Trade Opinion 1* is set equal to 1 for respondents who favor new trade barriers and is equal to zero for those opposed. *Trade Opinion 2* 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. Each of the measures is increasing in support for a protectionist policy.

Table 1 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 are influenced by the average wage of workers in the industry.

Support for new trade barriers is 11 percentage points higher (a 33% increase) for respondents who considered protection for an industry with a low wage versus respondents who considered protection for an industry with an average wage. This difference was 20 percentage points (an over 80% increase) for respondents who considered protection for an industry with a low wage versus respondents who considered protection for an industry with a high wage. The differences between the middle and high wage treatments are also substantively and statistically significant. The appendix reports additional estimates of differences across treatment categories controlling for various demographic characteristics of respondents. These estimates closely mirror those reported in Table 1.²¹

These experimental results provide strong evidence that increasing the average wage of the industry under consideration for trade protection reduces support for new trade barriers in that industry. The random assignment of the treatments in the experiment makes us confident that these differences are not attributable to other characteristics of the respondents or other selection effects. This result is consistent with the claim that inequality-averse citizens prefer to support the incomes of low-wage sectors more than high-wage sectors.

²¹The estimates, including the magnitudes, are also quite close to those reported in Lu, Scheve, and Slaughter (2010).

	Mean Estimates by Treatment Category			Difference Estimates		
	Low Wage \$18,000	Middle Wage \$40,000	High Wage \$80,000	Low-Middle	Low-High	Middle-High
<i>Trade Opinion 1</i>	0.444 (0.017)	0.332 (0.016)	0.239 (0.015)	0.112 (0.024)	0.205 (0.023)	0.093 (0.022)
<i>Trade Opinion 2</i>	2.406 (0.036)	2.205 (0.035)	1.998 (0.031)	0.201 (0.050)	0.408 (0.047)	0.207 (0.046)
Number of Observations	820	825	840	0.001	0.000	0.000

Table 1: Estimated Effect of Average Wage of Industry on Support for Trade Protection. Columns 1-3 report mean estimates for *Trade Opinion 1* and *Trade Opinion 2* by treatment category and the standard error of the estimate in parentheses. Columns 3-6 report difference-in-means tests, the standard error in parentheses, and p-value assuming unequal variances.

There obviously may be alternative reasons that respondents demonstrate greater support for protection in low-paying sectors but this pattern of support is certainly consistent with inequality aversion.

For the banker’s tax experiment, I constructed two measures of support for a new tax on banking incomes based on responses to the question described above. *Bank Tax Opinion 1* is set equal to 1 for respondents who favor the new tax and is equal to zero for those opposed. *Bank Tax Opinion 2* 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. Each of the measures is increasing in support for higher taxes on banking incomes.

Table 2 reports the mean estimates for each income treatment category and difference-in-means estimates for each combination of income treatments.²² The estimates are separated between the “Low Cost” and “High Cost” treatment conditions. These results provide substantial evidence that support for a new tax on banking incomes is influenced by the income levels of those affected by the tax under the “Low Cost” treatment condition but not under the “High Cost” treatment condition.

Under the “Low Cost” treatment for which it is assumed that for every 1,000 dollars in lost income for bankers, 900 dollars of revenue is raised, support for the additional tax on high banker incomes is about 8 percentage points higher (a 14% increase) for respondents who considered a tax increase that started for bankers earning 200,000 dollars per year or more compared with respondents who considered a tax increase applied to bankers with annual incomes of 100,000 dollars or more. The difference between the 300,000 dollar and 100,000 dollar treatments was about 16 percentage points.

The results under the “High Cost” treatment for which it is assumed that for every 1,000 dollars in lost income for bankers, only 500 dollars of revenue is raised suggest small and often statistically insignificant differences across the main treatments. For example, support for

²² Respondents working in the financial industry are excluded from the analysis.

	Mean Estimates by Treatment Category			Difference Estimates		
Low Cost Treatment	\$100k	\$200k	\$300k	\$100k-\$200k	\$100k-\$300k	\$200k-\$300k
<i>Bank Tax Opinion 1</i>	0.560 (0.025)	0.636 (0.025)	0.718 (0.022)	-0.076 (0.035)	-0.158 (0.034)	-0.082 (0.033)
<i>Bank Tax Opinion 2</i>	2.632 (0.058)	2.829 (0.057)	2.990 (0.054)	0.031 (0.081)	-0.358 (0.079)	0.014 (0.078)
Number of Observations	391	382	401	0.016	0.000	0.040
High Cost Treatment	\$100k	\$200k	\$300k	\$100k-\$200k	\$100k-\$300k	\$200k-\$300k
<i>Bank Tax Opinion 1</i>	0.569 (0.023)	0.610 (0.025)	0.636 (0.025)	-0.041 (0.034)	-0.067 (0.034)	-0.026 (0.035)
<i>Bank Tax Opinion 2</i>	2.709 (0.053)	2.825 (0.057)	2.861 (0.058)	0.228 (0.078)	0.049 (0.079)	0.459 (0.081)
Number of Observations	448	390	382	0.139	0.054	0.658

Table 2: Estimated Effect of Income Threshold on Support for New Tax on Banking Incomes. Columns 1-3 report mean estimates for *Bank Tax Opinion 1* and *Bank Tax Opinion 2* by treatment category and the standard error of the estimate in parentheses. Columns 3-6 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.

the additional tax on high banker incomes is about 4 percentage points higher for respondents who considered a tax increase that started for bankers earning 200,000 dollars per year or more compared with respondents who considered a tax increase applied to bankers with annual incomes of 100,000 dollars or more, and this difference is not statistically significant. The difference between the 300,000 dollar and 200,000 dollar treatments was even smaller. The total difference in support between the 100,000 and 300,000 treatment groups is almost 7 percentage points and the estimate is marginally statistically significant.

The appendix reports additional estimates of differences across treatment categories controlling for various demographic characteristics of respondents. These estimates closely mirror those reported in Table 2 for both the “Low Cost” and “High Cost” conditions.

This pattern of results suggests 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. This effect is consistent with inequality aversion in policy opinions but, as in the trade experiment, could be driven by another mechanism. The strong results for the “Low Cost” condition suggest that respondents are willing to incur some efficiency costs to implement policies which create greater equality while the weaker results for the “High Cost” condition indicate that this willingness has clear limits for many respondents. They are neither so envious nor so altruistic to choose policies generating greater equality at any price.

For the deficit reduction and income tax experiment, I constructed two measures of support for raising income taxes on relatively high earners. *Income Tax Opinion 1* is set equal to 1 for respondents who favor raising income taxes and is equal to zero for those opposed. *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. Each of the measures is increasing in support for raising income taxes.

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 estimates

for the full sample and the bottom panel reports results for respondents with incomes less than 40,000 dollars per year only. This subsample of respondents would not be directly affected by any of the proposed tax increases and therefore the results for this subsample are relatively more informative for interpreting the role of other regarding preferences in opinion formation about income tax changes. Overall, the results reported in Table 3 provide substantial evidence that support for income tax increases to balance the budget are influenced significantly by the income levels of those affected by the tax and that at least some of this effect may be driven by inequality aversion.

For the full sample, the support for tax increases is highly sensitive to the income threshold at which the tax increase would be applied. Support for the 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 interpretation, however, of these results for assessing the importance of other regarding preferences such as envy and altruism is rather 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 results reported in the bottom panel of Table 3 for individuals with incomes below 40,000 dollars per year provide evidence that self-interest may not be the only factor driving the estimates for the full sample. For this subsample, no respondents will have to pay the tax under any of the proposed treatment thresholds. Consequently, the experiment measures the willingness of respondents to tax others in order to reduce the deficit. The estimates indicate that respondents are much more willing to increase taxes on individuals with higher incomes. Support for the tax increase is about 29 percentage points higher when the threshold is set

	Mean Estimates by Treatment Category				Difference Estimates			
Full Sample	\$40k	\$80k	\$125k	\$40k-\$80k	\$40k-\$125k	\$80k-\$125k		
<i>Income Tax Opinion 1</i>	0.270 (0.016)	0.528 (0.017)	0.594 (0.017)	-0.258 (0.023)	-0.324 (0.023)	-0.067 (0.024)		
<i>Income Tax Opinion 2</i>	1.791 (0.038)	2.492 (0.041)	2.687 (0.043)	-0.701 (0.055)	-0.896 (0.057)	-0.194 (0.059)		
Number of Observations	792	862	831					
Less Than \$40K in Income Sample	\$40k	\$80k	\$125k	\$40k-\$80k	\$40k-\$125k	\$80k-\$125k		
<i>Income Tax Opinion 1</i>	0.330 (0.022)	0.618 (0.024)	0.658 (0.024)	-0.288 (0.033)	-0.328 (0.033)	-0.040 (0.034)		
<i>Income Tax Opinion 2</i>	1.970 (0.053)	2.732 (0.057)	2.891 (0.060)	-0.762 (0.078)	-0.921 (0.080)	-0.158 (0.083)		
Number of Observations	436	411	404					

Table 3: Estimated Effect of Income Threshold on Support for Income Tax Increases to Reduce the Deficit. Columns 1-3 report mean estimates for *Income Tax Opinion 1* and *Income Tax Opinion 2* by treatment category and the standard error of the estimate in parentheses. Columns 3-6 report difference-in-means tests, the standard error in parentheses, and p-value assuming unequal variances. The top panel reports these quantities for the full sample and the bottom panel reports these quantities for those respondents with personal incomes less than 40,000 dollars per year.

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 33 percentage points. Thus, the magnitudes of the differences across treatment groups are broadly similar to those for the full sample.

The appendix reports additional estimates of differences across treatment categories controlling for various demographic characteristics of respondents. These estimates closely mirror those reported in Table 3 for both the full sample and the lower income sample.

This pattern of results is broadly consistent with inequality aversion generally and with envy in particular. Again, other mechanisms could also account for the results. In particular, in this case expectations about future income mobility could explain why respondents are more willing to tax those with higher incomes. While keeping that caveat in mind, it is important to note that many of the alternative explanations for any one of the policy experiments is much less compelling as an account for all three experiments. For example, income mobility is not likely to explain preferences about banking incomes or sector-specific trade protection. Nonetheless, it would be useful to probe the results of these experiments further to determine the extent to which they provide evidence for the importance of inequality aversion generally and envy and altruism specifically in the formation of economic policy opinions and I turn to that task in the next section.

3.3 Estimation of Envy and Altruism Parameters

The analysis in this section is designed to estimate the envy and altruism parameters as defined in Fehr and Schmidt's (1999) formalization of inequality aversion and as applied to the three areas of policymaking explored in this paper. The empirical strategy is to derive an estimating equation from a model of policymaking in each area and to use the data from the survey experiments to estimate the envy and altruism parameters in those models. Importantly, the identification strategy relies on variation from the experimental treatments to identify the envy and altruism parameters. A full derivation of the theoretical

models and estimating equations is reported in the appendix. The discussion here focuses on summarizing the estimating equations and reporting the empirical results.

For trade policy, the indirect utility of an individual in considering policy alternatives can be simplified to:

$$Z_i = I_i - \alpha[\max\{I_j - I_i, 0\}] - \beta[\max\{I_i - I_j, 0\}] + \epsilon_i \text{ where } i \neq j \quad (2)$$

where Z_i is indirect utility; I_i is the individual's own income; I_j is the income of the average worker in the sector under consideration for trade protection (which will be raised if new trade barriers are adopted); ϵ_i is a normally distributed error term which should be considered to be all unobserved factors influencing opinion about sector-specific trade policy not included in the model, α is the envy parameter which indicates the magnitude of the utility loss when individual j earns more than individual i ; and β is the altruism parameter which indicates the magnitude of the utility loss when i earns more than individual j .

Let z_i^F be the utility to individual i from introducing new trade barriers and z_i^O be the utility to individual i from the status quo policy with no new trade barriers. Assume that the survey respondents answer the question favoring or opposing new trade barriers 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 new trade barriers 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 $P(Y^* \leq 0) = P(Y = 0)$ new trade barriers can be derived from the standard normal CDF. This yields:

$$P(Y = 1) = \Phi(\gamma_0 - \alpha[\max\{I_j - I_i, 0\}] - \beta[\max\{I_i - I_j, 0\}]) \quad (3)$$

where $\Phi(\cdot)$ is the standard normal CDF and γ_0 is a constant. Note that the income term I_i drops out when z_i^O is subtracted from z_i^F because trade barriers in sector j do not affect the income of individuals in other sectors in the model.

The variable *Trade Opinion 1* described above is defined to follow this estimation framework and is set equal to 1 if the respondent favors new trade barriers and is set equal to 0 if they are opposed. I also measured annual personal income in the survey. The survey assigned respondents to one of 19 annual personal income categories and then defined the actual magnitude of each respondent’s income as equal to the midpoint of the income range in which they placed themselves. This variable, *Personal Income*, serves as the measure of I_i . The variable *Other Income* is equal to the treatments in the survey question and takes on the three randomly assigned values of 18,000, 40,000, or 80,000 dollars. This variable serves as the measure of I_j . I define the variable *Envy* equal to *Other Income* minus *Personal Income* if *Other Income* is greater than *Personal Income* and equal to zero if not. I define the variable *Altruism* equal to *Personal Income* minus *Other Income* if *Personal Income* is greater than *Other Income* and equal to zero if not.²³ Thus, I have measures of each element of Equation 2 and the initial estimating equation is:

$$P(Y = 1) = \Phi(\gamma_0 + \alpha \textit{Envy} + \beta \textit{Altruism}) \quad (4)$$

I estimate this equation as a probit model and report heteroskedastic consistent standard errors.²⁴ The first key hypothesis from the model 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 (see appendix for details). The second main hypothesis from the model 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 (again see appendix for further details). In short, new trade barriers increase or decrease inequality depending on your own income and thus the direction of the

²³All of these variables are measured in thousands.

²⁴The preceding derivation could be adjusted for analysis of the ordered opinion measure *Trade Opinion 2* and estimated with an ordered probit model or a regression. The results below are qualitatively similar in these alternative specifications.

envy and altruism parameters, although both indicating a form of inequality aversion, are in opposite directions.²⁵

The initial specification follows directly from the theoretical framework. Given that the substantive interest is in estimating the *Envy* and *Altruism* parameters, it is important to note that this specification makes the usual strong identification assumptions of a cross-sectional analysis. These assumptions would be violated if the model was incomplete and the omitted factors were correlated with *Envy* or *Altruism*. Because *Personal Income* is a component of the *Envy* and *Altruism* variables, and because personal income and its correlates such as education have been shown to be associated with trade opinions, there is little doubt that the estimates in this baseline specification are biased.

In a second, preferred specification, I add three additional controls. The first is *Personal Income*; the second is an indicator variable, *Personal Income Greater*, equal to one if the individual's *Personal Income* is greater than the *Other Income* treatment which they received; and the third is an interaction term between *Personal Income Greater* and *Personal Income*. This specification recognizes that the *Envy* and *Altruism* variables are a function of *Personal Income*, *Other Income*, and which one is greater than the other. The experimental treatments ensure that *Other Income* is randomly assigned across respondents but *Personal Income* is not. However, once I control for *Personal Income*, *Personal Income Greater*, and their interaction, variation in the *Envy* and *Altruism* variables is driven exclusively by the random assignment of the *Other Income* treatments from the survey experiment. This specification has the substantial advantage of fully employing the experiment to identify the estimates of the *Envy* and *Altruism* parameters and yields consistent estimates of the parameters even if the model is incomplete.²⁶ For this reason, although I report results for the initial specification, I focus attention on the models that include *Personal Income*, *Personal*

²⁵Note that the estimates of the envy and altruism parameters investigate whether the data from the experiment are consistent with the theoretical framework. It is possible that an alternative theory, perhaps an alternative theory of other regarding preferences would explain the data as well.

²⁶Note that one potential concern is if there are heterogeneous treatment effects from the different components of the *Envy* and *Altruism* variables, this specification would only estimate the effect from the *Other Income* component of *Envy* and *Altruism*.

	Probit Model Estimates			
	Model 1	Model 2	Model 3	Model 4
	Coefficient Estimates	Coefficient Estimates	Coefficient Estimates	Coefficient Estimates
<i>Envy</i> , α	-0.007 (0.003)	-0.008 (0.002)	-0.009 (0.002)	-0.010 (0.003)
<i>Altruism</i> , β	0.000 (0.001)	0.000 (0.002)	0.000 (0.002)	0.002 (0.002)
<i>Personal Income</i> , γ_1	0.737	0.000 -0.008 (0.002)	0.001 -0.007 (0.002)	0.010 -0.010 (0.003)
<i>Personal Income Greater</i> , γ_2		0.000 0.118 (0.127)	0.000 0.092 (0.131)	0.002 -0.003 (0.203)
<i>Personal Income Greater</i> * <i>Personal Income</i> , γ_3		0.351 -0.000 (0.003)	0.482 -0.000 (0.003)	0.990 0.004 (0.004)
		0.957	0.897	0.308
Demographic Controls	No	No	Yes	Yes
State Fixed Effects	No	No	Yes	Yes
Industry Fixed Effects	No	No	No	Yes
Log-likelihood	-1562.8	-1544.3	-1472.6	-789.7
Observations	2,477	2,477	2,419	1,308

Table 4: Envy, Altruism, and Support for Trade Protection in the United States, Probit Estimates. The table reports the results of probit regressions for the variable *Trade Opinion 1* on *Envy*, *Altruism*, 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.

Income Greater, and their interaction as controls.²⁷ I also present additional results which add control variables to this second specification.

Table 4 reports the main results for trade policy opinions. The estimates for Model 1 are for the initial specification. The estimates are mixed. The coefficient estimate for the envy parameter is negative and statistically significant while the estimate for altruism, while positive as hypothesized, is small in magnitude and statistically insignificant. As

²⁷It is worth noting that the estimates for the *Envy* and *Altruism* parameters are qualitatively the same in unreported specifications that condition only on *Personal Income* in comparison to the specification highlighted here with all three controls.

discussed above, this specification follows from the theoretical model but is likely biased because although the *Other Income* component of *Envy* and *Altruism* is randomly assigned, the *Personal Income* component is not. Given the existing literature on the correlates of trade opinions, there are very good reasons to believe that there are unobserved and omitted factors influencing trade opinions which are correlated with *Envy* or *Altruism*. The Model 2 specification in Table 4 addresses this issue by adding the variables *Personal Income*, *Personal Income Greater* and their interaction.

The results for Model 2 indicate that the estimates for both envy and altruism are correctly signed and statistically and substantively significant. The estimated probit coefficient, α , for the variable *Envy* is equal to -0.008 with a standard error of 0.002. This indicates that, all else equal, individuals are less supportive of sector-specific trade barriers, the greater the income of the average worker in the industry under consideration for protection relative to the survey respondent. The magnitude of the envy effect is substantial. To get a sense of the substantive magnitude of this estimate, the effect of increasing the *Envy* measure from 0—the value assigned to the variable when the respondent has an income greater than or equal to the average income in the industry under consideration for trade protection—to 47.2—a two standard deviation increase equivalent to an income difference of \$47,200—on the probability of supporting new trade barriers, holding all other variables at their means is -0.136 (standard error of 0.028). This means that the probability of favoring new trade barriers falls 13.6 percentage points, which is about a 40% decrease from the overall mean of the *Trade Opinion 1* measure.

The estimated probit coefficient, β , for the variable *Altruism* is equal to 0.007 with a standard error of 0.002. The magnitude of this effect is also substantively significant. The effect of increasing the *Altruism* measure from 0—the value assigned to the variable when the respondent has an income less than or equal to the average income in the industry under consideration for trade protection—to 47.2—a two standard deviation increase equivalent to an income difference of \$47,200—on the probability of supporting new trade barriers, holding

all other variables at their means is 0.127 (standard error of 0.035). This means that the probability of favoring new trade barriers increases 12.7 percentage points, which is about a 37% increase from the overall mean of the *Trade Opinion 1* measure.

Table 4 also reports two additional specifications which add various control variables to Model 2. The Model 3 specification adds the variables *College Grad*, *Female*, and *Age* defined above and fixed effects for the state of the respondent. The Model 4 specification also adds fixed effects for industry of employment. The estimates of the envy and altruism parameters α and β are quite similar to those reported for Model 4. So although education and sex influence trade opinions, their inclusion makes little difference for the estimates because conditional on *Personal Income*, *Personal Income Greater*, and their interaction, variation in *Envy* and *Altruism* is randomly assigned and thus uncorrelated with education, sex, or any other determinants of trade opinion. Overall, the estimates in Table 4 provide robust evidence that envy and altruism have an important effect on support for trade protection.

The experiment on the new tax on banking incomes allows for estimation of the envy parameter but not the altruism parameter. 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 and because the survey top codes personal income at \$175,000, 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 U.S. population, there are only a couple of hundred observations above \$100,000. 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 off than they are. In contrast, the experiment is well suited for estimating the impact of envy on opinion formation as the treatments vary the relative income of those likely to be harmed by the policy without directly impacting

the incomes of the respondents.²⁸

The dependent variable is *Bank Tax Opinion 1* which is set equal to 1 if the respondent favors the new tax on banking incomes and is set equal to 0 if they are opposed. The initial estimating equation is:

$$P(Y = 1) = \Phi(\gamma_0 + \alpha \textit{Envy}) \quad (5)$$

and is estimated as a probit model. *Envy* is defined as in the trade experiment except that *Other Income* 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 envy in their preferences, lowering these bankers' incomes increases the utility of individuals who have lower incomes than the threshold.

As with the trade experiment, this initial specification follows from the theoretical framework but has the same potential identification problems. Here, I again, add three control variables—*Personal Income*, *Personal Income Greater*, and their interaction—in a second preferred specification. Once I control for *Personal Income*, *Personal Income Greater*, and their interaction, variation in the *Envy* variable is driven exclusively by the random assignment of the *Other Income* treatments from the survey experiment. For this reason, although I report results for the initial specification, I focus attention on the models that include *Personal Income*, *Personal Income Greater*, and their interaction as controls.²⁹ Finally, recall that the new banking tax experiment was conducted under both a “Low Cost” and “High Cost” frame. I report the separate estimates of the envy parameter for each condition.

²⁸ Respondents working in the financial sector are excluded from this analysis. Note that although there is almost no power in the experiment to estimate the altruism parameter, it is possible in some specifications to estimate a model including the variable. For all the reasons discussed above, it is not surprising that the estimates are small in magnitude and imprecisely estimated.

²⁹ It is worth noting that the estimates for the *Envy* parameter are qualitatively the same in unreported specifications that condition only on *Personal Income* in comparison to the specification highlighted here with all three controls. The results are also similar for specifications which add demographic controls and state fixed effects to Model 2.

	Probit Model Estimates			
	Low Cost		High Cost	
	Model 1	Model 2	Model 1	Model 2
	Coefficient Estimates	Coefficient Estimates	Coefficient Estimates	Coefficient Estimates
<i>Envy, α</i>	0.0022 (0.0004) 0.000	0.0021 (0.005) 0.000	0.0014 (0.0004) 0.001	0.0005 (0.005) 0.324
<i>Personal Income, γ_1</i>		0.0003 (0.0011) 0.756		-0.0020 (0.0011) 0.060
<i>Personal Income Greater, γ_2</i>		0.4936 (0.9447) 0.601		-0.7758 (0.8543) 0.364
<i>Personal Income Greater * Personal Income, γ_3</i>		-0.0047 (0.0067) 0.829		0.0009 (0.0062) 0.890
Log-likelihood	-753.2	-752.7	-811.0	-799.9
Observations	1,171	1,171	1,216	1,216

Table 5: Envy, Altruism, and Support for a Banking Income Tax, Probit Estimates. The table reports the results of probit regressions for the variable *Trade Opinion 1* on *Envy*, 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.

Table 5 reports the main results for the new tax on banking incomes. I 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 envy parameter is positive as predicted and statistically significant. As discussed above, this specification follows from the theoretical model but may be biased because although the *Other Income* component of *Envy* is randomly assigned, the *Personal Income* component is not. The Model 2 specification in Table 5 addresses this issue by adding the variables *Personal Income*, *Personal Income Greater* and their interaction.

The results for Model 2 indicate that the estimate for the envy parameter is again positive as predicted and statistically and substantively significant. The estimated probit coefficient, α , for the variable *Envy* is equal to 0.0021 with a standard error of 0.0005. 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. The magnitude of the envy effect is substantial. To get a sense of the substantive magnitude of this estimate, the effect of increasing the *Envy* measure from 0—the value assigned to the variable when the respondent has an income greater than or equal to the treatment threshold—to 169.4—a two standard deviation increase—on the probability of supporting the new tax, holding all other variables at their means is 0.140 (standard error of 0.032). This means that the probability of favoring the new tax on banking incomes increases 14 percentage points, which is about a 23% increase from the overall mean of the *Bank Tax Opinion 1* measure. Importantly, the role of envy appears to be conditional on how costly the policy is. The Model 2 estimate 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 and envy specifically may influence policy preferences but there are limits to how willing individuals are to incur costs to create equality.

The focus here on envy makes sense in light of the most salient dimensions of public re-

action to financial regulation during the aftermath of the economic crises. If other-regarding preferences are important for how people think about policy alternatives, it is likely that envy rather than altruism is the most relevant other-regarding consideration. That said, I conducted a follow up experiment, which was better designed for investigating the potential influence of both envy and altruism in preferences about financial market regulation. The experiment was based on the following question:

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. Here I was able to proceed with the analysis in a way analogous to the trade policy experiment. The results (not reported) suggest that both envy and altruism were evident in policy opinions about banking regulation. While the results of this analysis certainly do not undermine the very reasonable view that envy is likely the relatively most important other-regarding preference when it comes to public opinion about economic policymaking about finance, it does suggest that altruism should not be rule out as a relevant consideration.

The deficit reduction and income tax experiment allows for the estimation of both the envy and altruism parameters. One potential issue with this estimation is that the income tax experiment is not focused on a particular industry and so all respondents with incomes above the treatment threshold would be subject to the tax. Consequently, the policy change can affect both the respondent's own income as well as the income of others. To address this problem, it is necessary to control for personal income and a dummy variable for whether or not personal income is above or below the treatment threshold, and the interaction of these two variables.

The dependent variable is *Income Tax Opinion 1* which is set equal to 1 if the respondent favors increased taxes on incomes above the treatment threshold and is set equal to 0 if they are opposed. The initial estimating equation is:

$$P(Y = 1) = \Phi(\gamma_0 + \alpha \textit{Envy} + \beta \textit{Altruism} + \Pi X) \quad (6)$$

and is estimated as a probit model. *Envy* and *Altruism* are defined as in the other experiments except that *Other Income* is determined by the treatments for the income tax experiment. X is a vector of control variables which includes *Personal Income*, *Personal Income Greater*, and their interaction in the Model 2 specification and also includes various demographic variables and state fixed effects in the Model 3 specification. The first hypothesis is that $\alpha > 0$ because increasing income taxes will lower the after-tax returns to individuals with salaries over the threshold defined by the treatment and to the extent that respondents exhibit envy in their preferences, lowering these individuals' incomes increases the utility of respondents who have lower incomes than the threshold. The second main hypothesis is that $\beta < 0$ because the tax will decrease the after-tax income of individuals with incomes less than the respondent.

Table 6 reports the main results for the increase in the income tax experiment. The estimates are almost identical across the two specifications and I will focus on those for Model 2. The coefficient estimate for the envy parameter is positive as predicted and statistically significant. The estimated probit coefficient, α , for the variable *Envy* is equal to 0.0087 with a standard error of 0.0009. 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 envy effect is substantial. To get a sense of the substantive magnitude of this estimate, the effect of increasing the *Envy* measure from 0—the value assigned to the variable when the respondent has an income greater than or equal to the treatment threshold—to 70.8—a two standard deviation increase—on the probability of supporting the tax increase, holding all other variables at

	Probit Model Estimates	
	Model 2	Model 3
	Coefficient Estimates	Coefficient Estimates
<i>Envy, α</i>	0.0087 (0.0009)	0.0089 (0.0010)
	0.000	0.000
<i>Altruism, β</i>	-0.0054 (0.0026)	-0.0052 (0.0027)
	0.037	0.053
<i>Personal Income, γ_1</i>	0.0040 (0.0012)	0.0046 (0.0013)
	0.001	0.000
<i>Personal Income Greater, γ_2</i>	-0.6785 (0.1824)	-0.7291 (0.1905)
	0.000	0.000
<i>Personal Income Greater * Personal Income, γ_3</i>	0.0023 (0.0023)	0.0024 (0.0024)
	0.316	0.321
Demographic Controls	No	Yes
State Fixed Effects	No	Yes
Log-likelihood	-1570.3	-1492.7
Observations	2,477	2,412

Table 6: Envy, Altruism, and Support for Income Tax Increases, Probit Estimates. The table reports the results of probit regressions for the variable *Income Tax Opinion 1* on *Envy*, *Altruism*, 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.

their means is 0.239 (standard error of 0.025). This means that the probability of favoring the income tax change increases about 24 percentage points, which is about a 50% increase from the overall mean of the *Income Tax Opinion 1* measure.

The estimated probit coefficient, β , for the variable *Altruism* is equal to -0.0054 with a standard error of 0.0026. Although this estimate is only marginally statistically significant, the magnitude of the effect is substantively important. The effect of increasing the *Altruism* measure from 0—the value assigned to the variable when the respondent has an income less than or equal to the treatment threshold—to 70.8—a two standard deviation increase—on the probability of supporting the tax increase, holding all other variables at their means is -0.149 (standard error of 0.066). This means that the probability of favoring the income tax policy change decreases 15 percentage points (about 32% of the overall mean).

Overall, the estimates in Table 6 provide robust evidence that envy and altruism have an important effect on policy opinions about raising taxes. This is consistent with the overall argument of this paper emphasizing the importance of other-regarding preferences in opinion formation about economic policy alternatives. At the same time, the results 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. The role of self-interest is clearest in the income tax experiment by considering whether it makes a difference that individuals are above or below the threshold at which the tax increase will be implemented. The estimates for the coefficient *Personal Income Greater* (and its interaction with *Personal Income*) in Table 6 suggest that this difference implies, all else equal, about a 25 percentage point decrease in the probability of supporting an income tax increase.³⁰

³⁰While there is substantial empirical research consistent with there being an important role for self-interest in the formation of economic policy preferences and political behavior generally and certainly in the context of economic crises, there is also an important tradition in political science which takes a skeptical view (see e.g. Bartels 2008). The results of this study are in various ways consistent with self-interest playing a role but adjudicating this debate is not a central focus of this paper.

4 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, I investigate how one specific understanding of fairness—inequality aversion—influences individual policy opinions about economic policymaking in the context of an economic crisis. I argue that attitudes about inequality—both envy and altruism—lead to systematic differences in support for trade protection across different sectors of the economy, in support for taxing banking incomes, and in support for higher income taxes. In each policy domain, 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 empirical evidence from a set of original survey experiments on a

national sample of respondents in the United States (and I will shortly complement this with analogous experiments in France). First, I show experimentally how variation in the incomes of the beneficiaries of various policies influence support for those policies. I show that opinions about trade, financial market regulation, and 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, I adopt a specific formalization of inequality aversion, incorporate this utility function into standard models of policymaking, and estimate structurally an equation of policy preferences. I find that individuals have the social preferences of altruism and envy assumed in these models though the relative importance of these motivations vary across issue areas. Econometrically identifying these preferences lends considerable support to the main claim of this paper that envy and altruism play a central role in distributive political conflict over economic policies during times of economic crises. That said, the evidence presented here should be viewed as pointing in the direction of an important role for inequality aversion but it must be recognized that it is possible for alternative mechanisms to generate the pattern of preferences observed across the experiments. It must also be said that many such alternatives seem more plausible for one policy area than another and so fail to simply explain the pattern across all experiments in the way that inequality aversion does. Nonetheless, exploring new experiments and analyses to evaluate alternative mechanisms seems a productive task for future research.

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A Appendix

A.1 Social Concerns Models of Economic Policy Preferences

A.1.1 Trade

This section presents Lu, Scheve, and Slaughter’s (2010) model of trade preferences under the assumption that individuals are inequality averse and derives an econometric model for estimating the envy and altruism parameters of the theoretical model. Lu, Scheve, and Slaughter argue that if individual citizens and policymakers care not only about how trade policy influences their real incomes but also how it affects their incomes relative to others,

with a preference for policies that promote income equality, government policies will tend to support industries that employ lower-earning, less-skilled workers more intensively. For purposes of this paper, I consider only the implications of the model for individual preferences and present it here in order to justify the estimation strategy employed in Section 3.

In a perfectly competitive economy with a population size of N and n sectors, individuals maximize the utility function given by

$$u_i = x_0 + \sum_{i=1}^n u_i(x_i) - \frac{\alpha}{n-1} \sum_{i \neq j} \max\{I_j - I_i, 0\} - \frac{\beta}{n-1} \sum_{i \neq j} \max\{I_i - I_j, 0\} \quad (7)$$

This utility function has two components: utility from consumption ($x_0 + \sum_{i=1}^n u_i(x_i)$) and disutility from inequality aversion ($-\frac{\alpha}{n-1} \sum_{i \neq j} \max\{I_j - I_i, 0\} - \frac{\beta}{n-1} \sum_{i \neq j} \max\{I_i - I_j, 0\}$). Goods/sectors and types of individuals—as all individuals within a sector are identical—are indexed by i , $i = 1, 2, \dots, n$. x_0 is the consumption of the numeraire good 0 and x_i is the consumption of non-numeraire good i . The utility functions $u_i(\cdot)$ are increasing functions which are differentiable, separable, and strictly concave.

To account for inequality aversion, a social preference term is added to the individual's utility function. The term for inequality aversion is same as the specification in Equation (1) in Fehr and Schmidt (1999: 822). In particular, Fehr and Schmidt specify one parameter (β) for "altruism" when $I_i > I_{-i}$, and the other parameter for "envy" (α) when $I_i < I_{-i}$. This specification of the utility function implies that an individual would feel altruistic to those who earn less than him/her, and at the same time feel envious of those who earn more.

Let ϕ_i indicate the fraction of population N working in sector i , and assume that workers in sector i all earn identical incomes which are a function of their labor and the return to sector-specific skills and/or inputs owned only by individuals working in each respective sector. Note that an individual owns at most one type of sector-specific input, and assume the sector-specific factor input is indivisible and non-tradable. The technologies to produce these goods have constant returns to scale, and the specific factor inputs have inelastic

supplies. The numeraire good 0 is produced with labor alone and sets the economy-wide return to labor. The non-numeraire good i is produced with labor and the sector-specific factor input. Normalize the wage of good 0 to 1, and the aggregate reward to the specific factor depends on the domestic price of the good, that is, $\pi_i(p_i)$, where p_i is the domestic price. Index each sector's per capita return such that $\frac{\pi_i(p_i)}{\phi_i N} > \frac{\pi_{i-1}(p_{i-1})}{\phi_{i-1} N}$. The total income (I_i) to an individual in sector i , is equal to their wage of 1 plus $\frac{\pi_i(p_i)}{\phi_i N}$. Individual consumption must meet the budget constraint such that $I_i \geq x_0 + \sum_{i=1}^n p_i x_i$. Denote the exogenous world price of goods to be p_i^* .

The net revenue per capita from trade policies (tariffs or subsidies) is expressed as

$$r(\mathbf{p}) = \sum_{i=1}^n (p_i - p_i^*) [d_i(p_i) - \frac{1}{N} y_i(p_i)] \quad (8)$$

where $d_i(p_i)$ is the demand function of good i by an individual, and $d_i(\cdot)$ equals to the inverse of $u'_i(x_i)$, and $y_i(p_i)$ is the domestic output of good i and $y_i(p_i) = \pi'_i(p_i)$. $\mathbf{p} = (p_1, p_2, \dots, p_n)$ is a vector of domestic prices of the non-numeraire goods. Each individual receives an equal net transfer of $r(\mathbf{p})$. The consumer surplus derived from these goods is $s(\mathbf{p}) \equiv \sum_i u_i[d_i(p_i)] - \sum_i p_i d_i(p_i)$. Given these assumptions, individuals' indirect utility in sector i can be derived as follows:

$$\begin{aligned} Z_i(\mathbf{p}) = & 1 + \frac{\pi_i(p_i)}{\phi_i N} + r(\mathbf{p}) + s(\mathbf{p}) - \frac{\alpha}{n-1} \sum_{i \neq j} \max\left\{ \frac{\pi_j(p_j)}{\phi_j N} - \frac{\pi_i(p_i)}{\phi_i N}, 0 \right\} \\ & - \frac{\beta}{n-1} \sum_{i \neq j} \max\left\{ \frac{\pi_i(p_i)}{\phi_i N} - \frac{\pi_j(p_j)}{\phi_j N}, 0 \right\} \end{aligned} \quad (9)$$

Individual preferences about trade policy in sector j are determined by how a marginal change in the price of good j due to a tariff or subsidy will impact this function:

$$\frac{\partial Z_i}{\partial p_j} = \frac{1}{N} [(p_j - p_j^*) m'_j(p_j) - y_j(p_j)] - \frac{\alpha}{n-1} \frac{y_j(p_j)}{\phi_j N} \quad \text{if } \frac{\pi_j(p_j)}{\phi_j N} > \frac{\pi_i(p_i)}{\phi_i N} \ \& \ i \neq j \quad (10a)$$

$$\frac{\partial Z_i}{\partial p_j} = \frac{1}{N}[(p_j - p_j^*)m'_j(p_j) - y_j(p_j)] + \frac{\beta}{n-1} \frac{y_j(p_j)}{\phi_j N} \quad \text{if } \frac{\pi_j(p_j)}{\phi_j N} < \frac{\pi_i(p_i)}{\phi_i N} \text{ \& } i \neq j \quad (10b)$$

$$\frac{\partial Z_i}{\partial p_j} = y_j(p_j) + \frac{1}{N}[(p_j - p_j^*)m'_j(p_j) - y_j(p_j)] + [(n-i)\frac{\alpha}{n-1} - (i-1)\frac{\beta}{n-1}] \frac{y_j(p_j)}{\phi_j N} \quad \text{if } i = j \quad (10c)$$

where $m_j(p_j) \equiv Nd_j(p_j) - y_j(p_j)$ is the net import function. Assuming good j is a normal good, then $y_i(p_i) = \pi'_i(p_i) > 0$. I also note that $m'_j(p_j) < 0$. Hence, an increase of price for good j will tend to reduce the welfare of individual i because of the net negative effect of the impact on consumer welfare and tariff revenue is $\frac{1}{N}[(p_j - p_j^*)m'_j(p_j) - y_j(p_j)] < 0$. Inequality aversion means that an increase in the price for good j reduces the individual i 's welfare due to envy if individuals in sector j earn more than individuals in sector i (by $-\frac{\alpha}{n-1} \frac{y_j(p_j)}{\phi_j N}$) but increases welfare due to altruism if individuals in sector j earn less than individuals in sector i (by $+\frac{\beta}{n-1} \frac{y_j(p_j)}{\phi_j N}$). These two relationships imply that individuals considering whether to support sector-specific trade protection that would increase the price and incomes in another sector will, all else equal, be less likely to support barriers if they have a lower income than workers in the industry under consideration for protection—envy effect—and more likely to support barriers if they have a higher income than workers in the industry under consideration for protection—altruism effect. The empirical work tests this central feature of the model. For $i = j$, individuals in this group will gain income from tariff protection. However, the effect of inequality aversion may either increase or decrease workers' welfare, depending on where sector i 's per capita factor endowment return falls in the overall income distribution as well as on the degree of altruism and envy.

To derive the statistical model for estimating the effect of envy and altruism on support for sector-specific trade protection, I start with the individual indirect utility function in Equation (9), introduce an error term, and specify its distribution. The error term should be thought to be composed primarily of those factors influencing opinion about sector-specific trade protection not included in the model. The addition of the error term, ϵ_i , yields:

$$\begin{aligned}
Z_i(\mathbf{p}) &= 1 + \frac{\pi_i(p_i)}{\phi_i N} + r(\mathbf{p}) + s(\mathbf{p}) - \frac{\alpha}{n-1} \sum_{i \neq j} \max\left\{\frac{\pi_j(p_j)}{\phi_j N} - \frac{\pi_i(p_i)}{\phi_i N}, 0\right\} \\
&\quad - \frac{\beta}{n-1} \sum_{i \neq j} \max\left\{\frac{\pi_i(p_i)}{\phi_i N} - \frac{\pi_j(p_j)}{\phi_j N}, 0\right\} + \epsilon_i
\end{aligned} \tag{11}$$

I assume that ϵ_i is normally distributed and that it enters the function additively. I further simplify the model in three ways. First, I omit the terms $r(\mathbf{p})$ and $s(\mathbf{p})$, which represent per capita tariff revenues and per capita consumer surplus. Neither argument varies across individuals and so will be captured by the constant in the estimating equation. Second, the survey question forces respondents to focus on one industry at a time and so I consider only income differences between the individual and the average worker in this industry. Consistent with the model, this assumes that changes in trade policy in one industry do not affect income in other industries. Third, the term $\frac{\pi_i(p_i)}{\phi_i N}$ is equal to the portion of individual i 's income that varies across individuals/sectors and is denoted as I_i (and analogously for individual/sector j). These simplifications yield:

$$Z_i(\mathbf{p}) = I_i - \alpha[\max\{I_j - I_i, 0\}] - \beta[\max\{I_i - I_j, 0\}] + \epsilon_i \text{ where } i \neq j \tag{12}$$

Let z_i^F be the utility to individual i from introducing new trade barriers and z_i^O be the utility to individual i from the status quo policy with no new trade barriers. I assume that the survey respondents answer the question favoring or opposing new trade barriers 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 new trade barriers 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 $P(Y^* \leq 0) = P(Y = 0)$ new trade barriers can be derived from the standard normal CDF. This yields:

$$P(Y = 1) = \Phi(\gamma_0 - \alpha[\max\{I_j - I_i, 0\}] - \beta[\max\{I_i - I_j, 0\}]) \tag{13}$$

where $\Phi(\cdot)$ is the standard normal CDF and γ_0 is a constant. Note that the income term $I_i = \frac{\pi_i(p_i)}{\phi_i N}$ drops out when z_i^O is subtracted from z_i^F because trade barriers in sector j do not affect the income of individuals in other sectors in the model.

The variable *Trade Opinion 1* described above is defined to follow this estimation framework and is set equal to 1 if the respondent favors new trade barriers and is set equal to 0 if they are opposed. I also measured annual personal income in the survey. The survey assigned respondents to one of 19 annual personal income categories and then defined the actual magnitude of each respondent's income as equal to the midpoint of the income range in which they placed themselves. This variable, *Personal Income*, serves as the measure of I_i . The variable *Other Income* is equal to the treatments in the survey questions and takes on the three randomly assigned values of 18,000, 40,000, or 80,000 dollars. This variable serves as the measure of I_j . I define the variable *Envy* equal to *Other Income* minus *Personal Income* if *Other Income* is greater than *Personal Income* and equal to zero if not. I define the variable *Altruism* equal to *Personal Income* minus *Other Income* if *Personal Income* is greater than *Other Income* and equal to zero if not.³¹ Thus, I have measures of each argument in Equation (13) and the initial estimating equation is:

$$P(Y = 1) = \Phi(\gamma_0 + \alpha \textit{Envy} + \beta \textit{Altruism}) \quad (14)$$

I estimate this equation as a probit model and report heteroskedastic consistent standard errors.³² The first key hypothesis from the model 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 (see Equation (10a) above). The second main hypothesis from the model 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

³¹All of these variables are measured in thousands.

³²The preceding derivation could be adjusted for analysis of the ordered opinion measure *Trade Opinion 2* and estimated with an ordered probit model or a regression. The results are qualitatively similar in these alternative specifications.

for trade protection (see Equation (10b) above). In short, new trade barriers increase or decrease inequality depending on your own income and thus the direction of the envy and altruism parameters, although both indicating a form of inequality aversion, are in opposite directions.

A.1.2 Banking Income Taxes

To be completed.

A.1.3 Income Taxes and the Deficit

To be completed.

A.2 Descriptive Statistics

	Observations	Mean	Std. Dev.
<i>Trade Opinion 1</i>	2,485	0.338	0.473
<i>Trade Opinion 2</i>	2,470	2.201	0.981
<i>Bank Tax Opinion 1</i>	2,485	0.618	0.486
<i>Bank Tax Opinion 2</i>	2,480	2.797	1.125
<i>Income Tax Opinion 1</i>	2,485	0.468	0.499
<i>Income Tax Opinion 2</i>	2,481	2.334	1.223
<i>Female</i>	2,474	0.552	0.497
<i>Age</i>	2,485	46.383	14.959
<i>Unemployed</i> ³³	1,576	0.126	0.332
<i>Labor Force</i>	2,485	0.634	0.482
<i>Personal Income</i> ³⁴	2,477	37,500	NA
<i>College Graduate</i>	2,477	0.409	0.492

Table A-1: Descriptive Statistics.

A.3 Regression Treatment Estimates

This section reports additional estimates of differences across treatment categories controlling for various demographic characteristics of respondents. These estimates closely mirror those

reported in Table 1, 2, and 3.

For the trade policy experiment, Table A-2 reports estimates of the differences across the treatment categories controlling for various demographic characteristics of respondents and fixed effects for geographical location and industry of employment. This framework allows identification of the treatment effects within geographical location, industry, and other respondent characteristics. I estimate the following ordinary least squares regressions:

$$TradeOpinion1_{i,k,j} = \pi_0 + \pi_1 MWT_{i,k,j} + \pi_2 HWT_{i,k,j} + \Pi X_{i,k,j} + \delta_k + \eta_j + \epsilon_{i,k,j} \quad (15)$$

where the dependent variable *Trade Opinion 1* is the dichotomous measure described in the main text and is increasing in support for trade protection; *MWT*, *Middle Wage Treatment*, is a dichotomous measure equal to one if the respondent received the middle wage treatment and zero otherwise; *HWT*, *High Wage Treatment*, is a dichotomous measure equal to one if the respondent received the high wage treatment and zero otherwise; X is a vector of demographic variables measuring education attainment, sex, age, and income;³⁵ δ_k are fixed effects for the state the respondent lives in; η_j are fixed effects for industries; ϵ is the error term; i , k , and j index individuals, geographic locations, and industries respectively; and π_0 , π_1 , π_2 , and Π are parameters to be estimated. The omitted treatment category is *Low Wage Treatment* and so the parameters π_1 and π_2 should be interpreted respectively as the effect of being exposed to the middle and high wage treatments compared to the low wage treatment. The estimates reported in Table A-2 are nearly identical to those discussed for Table 1 without control variables. Model A1 excludes industry fixed effects and Model A2 includes them. It is worth noting the stability of these estimates across the two models despite the fact that the specifications with industry fixed effects have many fewer observations because individuals not in the labor market cannot be coded for this

³⁵The variables are *College Grad* equal to one if the respondent graduated from college and zero if not, *Female* equal to one if the respondent is female and zero if not, *Age* equal to age in years, and *Personal Income* equal to an individual's annual income.

	Ordinary Least Squares Estimates	
	Model A1	Model A2
<i>Middle Wage Treatment</i>	-0.105 (0.025)	-0.075 (0.033)
<i>High Wage Treatment</i>	0.000 -0.199 (0.023)	0.024 -0.201 (0.032)
	0.000	0.000
Demographic Controls	Yes	Yes
State Fixed Effects	Yes	Yes
Industry Fixed Effects	No	Yes
Standard Error of Regression	0.464	0.466
Observations	2,427	1,333

Table A-2: Estimated Effect of Average Wage of Industry on Support for Trade Protection, Linear Probability Model Estimates. The table reports the results of ordinary least squares regressions for the variable *Trade Opinion 1* on *Middle Wage Treatment*, *High Wage Treatment*, and various control variables. The omitted treatment is the *Low Wage Treatment*. The demographic control variables include *College*, *Female*, *Age*, and *Income*. For each model, the table reports the 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.

variable.

For the new tax on banking incomes experiment, Table A-3 reports estimates of the differences across the treatment categories controlling for various demographic characteristics of respondents and fixed effects for geographical location. Again, this framework allows identification of the treatment effects within geographical location and other respondent characteristics. I estimate the following ordinary least squares regressions:

$$BankTaxOpinion1_{i,k} = \pi_0 + \pi_1\$200kT_{i,k} + \pi_2\$300kT_{i,k} + \Pi X_{i,k} + \delta_k + \epsilon_{i,k} \quad (16)$$

where the dependent variable *Bank Tax Opinion 1* is the dichotomous measure described in the main text and is increasing in support for the introduction of a new tax on high bank incomes; $\$200kT$, $\$200k Treatment$, is a dichotomous measure equal to one if the respondent

received the treatment for which the new tax would be applied to banking incomes greater than \$200,000 and zero otherwise; $\$300kT$, $\$300k$ Treatment, is a dichotomous measure equal to one if the respondent received the high wage treatment and zero otherwise; X is a vector of demographic variables measuring education attainment, sex, age, and income; δ_k are fixed effects for the state the respondent lives in; ϵ is the error term; i and k index individuals and states respectively; and π_0 , π_1 , π_2 , and Π are parameters to be estimated. The omitted treatment category is $\$100k$ Treatment and so the parameters π_1 and π_2 should be interpreted respectively as the effect of being exposed to the $\$200k$ Treatment and $\$300k$ Treatment compared to the $\$100k$ Treatment. Table A-3, like Table 2, reports separate estimates for those respondents who considered the tax under the “Low Cost” condition and those who considered the tax under the “High Cost” condition. The estimates reported in Table A-3 are nearly identical to those discussed for Table 2 without control variables. Again, there is clear evidence that respondents are more supportive of introducing the new tax when the bankers to be affected by the tax have higher incomes as long as the efficiency costs of the tax are not too high.

For the income tax experiment, Table A-4 reports estimates of the differences across the treatment categories controlling for various demographic characteristics of respondents and fixed effects for geographical location. I estimate the following ordinary least squares regressions:

$$IncomeTaxOpinion1_{i,k} = \pi_0 + \pi_1\$80kT_{i,k} + \pi_2\$125kT_{i,k} + \Pi X_{i,k} + \delta_k + \epsilon_{i,k} \quad (17)$$

where the dependent variable *Income Tax Opinion 1* is the dichotomous measure described in the main text and is increasing in support for higher income taxes; $\$80kT$, $\$80k$ Treatment, is a dichotomous measure equal to one if the respondent received the treatment for which the increase in income taxes would be applied to incomes greater than \$80,000

	Ordinary Least Squares Estimates	
	Model A1	
	Low Cost	High Cost
<i>\$200k Treatment</i>	0.074 (0.037)	0.035 (0.035)
	0.044	0.313
<i>\$300k Treatment</i>	0.163 (0.034)	0.069 (0.035)
	0.000	0.049
Demographic Controls	Yes	Yes
State Fixed Effects	Yes	Yes
Standard Error of Regression	0.476	0.484
Observations	1,146	1,193

Table A-3: Estimated Effect of Income Threshold on Support for New Tax on Banking Incomes, Linear Probability Model Estimates. The table reports the results of ordinary least squares regressions for the variable *Bank Tax Opinion 1* on *\$200k Treatment*, *\$300k Treatment*, and various control variables. The omitted treatment is the *\$100k Treatment*. The demographic control variables include *College*, *Female*, *Age*, and *Income*. For each model, the table reports the 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.

	Ordinary Least Squares Estimates	
	Model A1	
	Full Sample	<\$40k Sample
<i>\$80k Treatment</i>	0.260 (0.023)	0.283 (0.033)
<i>\$125k Treatment</i>	0.000 0.335 (0.024)	0.000 0.324 (0.034)
Demographic Controls	Yes	Yes
State Fixed Effects	Yes	Yes
Standard Error of Regression	0.468	0.471
Observations	2,427	1,228

Table A-4: Estimated Effect of Income Threshold on Support for Income Tax Increases to Reduce the Deficit, Linear Probability Model Estimates. The table reports the results of ordinary least squares regressions for the variable *Income Tax Opinion 1* on *\$80k Treatment*, *\$125k Treatment*, and various control variables. The omitted treatment is the *\$40k Treatment*. The demographic control variables include *College*, *Female*, *Age*, and *Income*. For each model, the table reports the 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.

and zero otherwise; $\mathbb{1}_{125kT}$, $\mathbb{1}_{125k Treatment}$, is a dichotomous measure equal to one if the respondent received the high wage treatment and zero otherwise; X is a vector of demographic variables measuring education attainment, sex, age, and income; δ_k are fixed effects for the state the respondent lives in; ϵ is the error term; i and k index individuals and states respectively; and π_0 , π_1 , π_2 , and Π are parameters to be estimated. The omitted treatment category is *\$40k Treatment* and so the parameters π_1 and π_2 should be interpreted respectively as the effect of being exposed to the *\$80k Treatment* and *\$125k Treatment* compared to the *\$40k Treatment*. Table A-4, like Table 3, reports separate estimates for full sample and for those respondents with personal incomes less than \$40,000. The estimates reported in Table A-4 are extremely close to those discussed in Table 3 without control variables.