NBER WORKING PAPER SERIES

ENVY, ALTRUISM, AND THE INTERNATIONAL DISTRIBUTION OF TRADE PROTECTION

Xiaobo Lü
Kenneth F. Scheve
Matthew J. Slaughter

Working Paper 15700
http://www.nber.org/papers/w15700

NATIONAL BUREAU OF ECONOMIC RESEARCH
1050 Massachusetts Avenue
Cambridge, MA 02138
January 2010

We would like to thank Mostafa Beshkar, John Bullock, Eric Dickson, Alan Gerber, Nuno Limao, Helen Milner, Daniel Nielson, Dustin Tingley, and Michael Tomz for comments on a previous draft. We are grateful for financial support from Yale University's MacMillan Center for International and Area Studies and the Institution for Social and Policy Studies. The views expressed herein are those of the authors and do not necessarily reflect the views of the National Bureau of Economic Research.

Envy, Altruism, and the International Distribution of Trade Protection
Xiaobo Lü, Kenneth F. Scheve, and Matthew J. Slaughter
NBER Working Paper No. 15700
January 2010
JEL No. D63,D64,F13,F59

ABSTRACT

One important puzzle in international political economy is why lower-earning and less-skilled intensive industries tend to receive relatively high levels of trade protection. This pattern of protection holds even in low-income countries in which less-skilled labor is likely to be the relatively abundant factor of production and therefore would be expected in many standard political-economy frameworks to receive relatively low, not high, levels of protection. We propose and model one possible explanation: that individual aversion to inequality—both envy and altruism—lead to systematic differences in support for trade protection across industries, with sectors employing lower-earning workers more intensively being relatively preferred recipients for trade protection. We conduct original survey experiments in China and the United States and provide strong evidence that individual policy opinions about sector-specific trade protection depend on the earnings of workers in the sector. We also present structural estimates of the influence of envy and altruism on sector-specific trade policy preferences. Our estimates indicate that both envy and altruism influence support for trade protection in the United States and that altruism influences policy opinions in China.

Xiaobo Lü
Department of Political Science
Yale University
New Haven, CT 06520-8301
xiaobo.lu@yale.edu

Kenneth F. Scheve
Department of Political Science
Yale University
New Haven, CT 06520-8301
kenneth.scheve@yale.edu

Matthew J. Slaughter
Tuck School of Business
Dartmouth College
100 Tuck Hall
Hanover, NH 03755
and NBER
matthew.j.slaughter@dartmouth.edu

1 Introduction

One important puzzle in international political economy is why lower-earning and less-skilled intensive industries tend to receive relatively high levels of trade protection. Because this pattern of protection holds even in low-income countries in which less-skilled labor is likely to be the relatively abundant factor of production, it is arguably at odds with the common empirical finding that declining, comparative disadvantage industries are more likely to receive protection. Moreover, it is at odds with most theoretical political economy models which tend to either predict, consistent with most empirical work, that losing sectors from international trade receive more protection or that expanding sectors that gain from greater trade should enjoy more government support. Existing accounts are generally good at explaining support for winners or for losers. They are not, however, good at explaining why winning sectors are supported in some countries and losing sectors in others, and they do not explain why lower-earning sectors seem to be advantaged in the contest for government support in almost all countries. Our paper analyzes this puzzle in two steps.

First, we propose and model one possible explanation: that individual preferences over trade policy are shaped by considerations of others, above and beyond 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.

Our model of trade policy incorporates 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). We show how individual attitudes about inequality—both envy and altruism—lead to systematic differences in support for trade protection across industries

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

with sectors employing lower-earning workers more intensively being relatively preferred recipients for trade protection. The essence of our argument is 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, then government policies will tend to support industries that employ lower-earning, less-skilled workers more intensively. Importantly, we suggest the possibility that these preferences will be observed across lots of different types of countries and will influence the observed sectoral distribution of trade protection across countries with very different factor endowments and political institutions.

The second step of our paper is to evaluate the argument empirically through the analysis of original survey experiments on national samples of citizens in China and the United States. These analyses include two main tests. First, in a survey question, we randomly assign the average wage of the worker in the industry under consideration for trade protection and estimate the effect of variation in workers' wages on support for sectoral trade protection. In both China and the United States, we find that sectors with lower average incomes receive broader support for trade protection. Second, we derive from our model and estimate an equation of policy preferences and we find evidence that the social preferences assumed in our model do influence support for sector-specific trade protection.

Our estimates for the United States indicate that support for sector-specific trade protection depends on both altruism and envy. Increasing our 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 (a $48,400 annual difference) raises the probability that respondents support trade protection by 18 percentage points (about a 59% 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 (a $48,800 annual difference), lowers the probability that respondents support trade protection by 16 percentage points (about a 53% decrease). Our estimates for China indicate that support for sector-specific

trade protection depends on altruism but provides little evidence of a substantively important effect for envy. Increasing the measure of altruism by two standard deviations (a 2,680 yuan difference on a monthly basis) raises the probability that respondents support trade protection by almost 17 percentage points (about a 37% increase). We also present evidence from a follow-up experiment in the United States that social preferences remain important for understanding variation in support for sectoral trade protection when the inefficiency of the policy is made more salient.

Overall, our analysis finds substantial evidence that Chinese and American citizens exhibit inequity aversion in their preferences for sector-specific trade protection. In turn, this feature of preferences can explain the puzzle of lower-earning sectors receiving greater trade protection in so many countries around the world. Such preferences would be influential across a wide variety of political economy models of trade including standard lobbying models such as Grossman and Helpman's (1994) protection-for-sale model. Moreover, the paper builds on recent contributions by Rotemberg (2003), Freund and Ozden (2008), and Tovar (2009), which also adopt nonstandard preferences to explain patterns of trade policy. The approach in those papers is to suggest if voters had certain types of preferences, certain anomalies in observed trade policymaking could be resolved. Our paper takes a similar approach but also provides evidence that such preferences are actually observed in the area of trade policymaking. This feature of the paper also contributes to the literature on the determinants of trade policy opinions, for which various departures from self-interest have been considered.[2]

Beyond trade policy, our paper provides a new methodology for investigating the role of envy and altruism in determining policy preferences. This general strategy could be applied to many other areas of economic policymaking for which envy and altruism may be influential in opinion formation. Finally, our paper contributes to the broader behavioral economics literature on social preferences. Much of the empirical evidence in this literature that individuals have other-regarding preferences is based on how subjects behave in a

[2]Previous research on trade preferences includes, among others, Scheve and Slaughter (2001a), O'Rourke and Sinnott (2001), Baker (2005), Hays, Ehrlich, and Peinhardt (2005), Mayda and Rodrik (2005), and Hainmueller and Hiscox (2006).

laboratory setting playing abstract games.[3] Our analysis of policy opinions using survey experiments provides evidence of such preferences in a real political economy setting. Although responses to survey questions are costless, it is precisely these responses and the factors that drive them that policymakers respond to in the policymaking process. As such, evidence of social preferences in policy opinions as presented in this paper suggests one way that the other-regarding behavior observed in so many laboratory environments may influence actual political-economic outcomes.

The rest of our paper is organized as follows. In Section 2, we document the puzzle that lower-earning, less-skilled sectors receive more trade protection in many countries around the world. In Section 3, we model trade policy preferences in a setting in which individual preferences display inequity aversion. Our empirical analysis of the role of inequality aversion in sector-specific trade preferences in the United States and China is in Section 4, and Section 5 offers some concluding remarks.

2 The Puzzle: Sectoral Wages and the Distribution of Trade Protection

This section provides descriptive evidence that for a broad sample of countries, low-earning, less–skilled intensive industries receive relatively high levels of trade protection. This pattern of protection holds even in low-income countries in which less-skilled labor is likely to be the relatively abundant factor of production and therefore would be expected in many standard explanations of the determinants of trade policy to receive relatively low, not high, levels of protection.

Figure 1 plots trade-weighted tariffs in United States manufacturing industries in 2000 against normalized average wages in those sectors.[4] This graph shows a familiar pattern to

[3] See Levitt and List (2007) for a skeptical review of the real world importance of social preferences observed in laboratory settings but also DellaVigna (2009) for reasons why laboratory results may both over and underestimate the empirical importance of other-regarding preferences.

[4] The data are for 4-digit, ISIC, revision 3 manufacuturing sectors. The source for the tariff data is the TRAINS database. The source for the wage data is the most recent UNIDO Industrial Statistics Database (INDSTAT4 2008 ISIC Rev. 3). The outlier industry in the upper right of the graph is Tobacco Products,

students of trade policymaking in the United States. Tariffs are relatively low in the United States but those industries that use lower-skilled, lower-paid workers more intensively receive higher levels of trade protection. This graph would look very similar employing alternative measures of trade protection and skill intensity.

The most common explanation for the pattern of trade protection observed in this and similar graphs is that comparative disadvantage sectors—losers from expanding trade—get more protection. A large empirical literature has documented the tendency of governments to provide greater trade protection to declining industries. In the United States and Europe for example, heavily protected industries include textiles, footwear, clothing, and agriculture which have been contracting for decades. Gawande and Krishna (2003) and Baldwin and Robert-Nicoud (2007) review a number of alternative measures that have been documented to be correlated with higher levels of trade protection in declining industries. These include industry growth rates in terms of output and employment and changes in import penetration ratios. The general idea is simply that governments tend to pick losers when they intervene to support domestic industries.

The reasons for this pattern of intervention are not obvious. As Baldwin and Robert-Nicoud (2007) note, the dominant approach for explaining which industries get protected is various lobbying models and there are good reasons to think that larger, expanding industries would have more resources for lobbying governments to support their businesses.[5] Some explanations for this phenomenon include the idea that losing sectors lobby harder because rents from lobbying are not competed away through entry of new firms, at least as long as the benefits of protection are not too great (Baldwin and Robert-Nicoud, 2007). Grossman and Helpman (1996) focus on the possibility that the asymmetry in lobbying effort may be due to greater free riding in expanding sectors. Krueger (1990) argues that policymakers privilege declining industries because this supports the income of known workers whereas supporting expanding sectors supports unknown beneficiaries. A number of papers have

which is an outlier in many other countries as well.

[5] See, for example, Olson (1965), Stilger (1971), Peltzman (1976), Hillman (1982), Milner (1987), Grossman and Helpman (1994), Gilligan (1997), Hiscox (1999), and Goldberg and Maggi (1999).

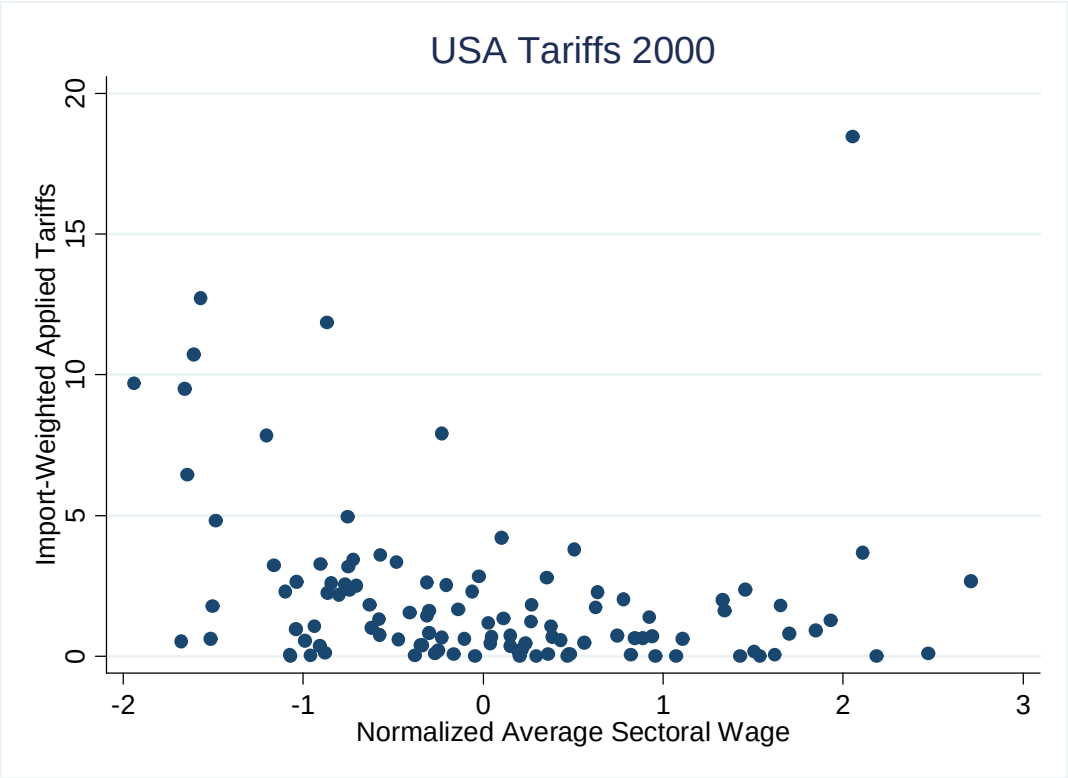

Figure 1: Import-Weighted Applied Tariffs and Average Wages in U.S. Manufacturing in 2000. This figure plots import-weighted applied tariffs in 4-digit, ISIC, Revision 3 manufacturing industries in the United States in 2000 against normalized average wages in these industries. See text for sources.

suggested various ways in which policymakers and/or citizens may be generally averse to income losses and that this aversion directly affects how governments set policy in declining and expanding industries (Freund and Ozden 2008, Tovar 2009, Corden 1974).[6]

One implication of the idea that governments tend to support declining sectors is that we should expect significant differences across countries in the distribution of trade protection across different sectors of the economy. While some losing sectors may be common across all countries due to changes in technology or consumer tastes, many changes in the fortunes of industries will reflect differences in comparative advantage across countries. For example, it is not an accident that commonly cited declining industries in the United States include

[6] See Baldwin and Robert-Nicoud (2007) for a more complete review.

textiles, footwear, and toys. These industries are declining in the U.S. in part because they use less-skilled labor intensively, a factor with which the U.S. is not well endowed. In contrast, these industries have been expanding in other countries that are abundant in less-skilled workers. More generally, to the extent that winning and losing sectors are in part determined by comparative advantage, we would expect that patterns of trade protection vary across countries according to their relative factor endowments.

To investigate this question further, Figure 2 plots trade-weighted tariffs in Chinese manufacturing industries in 2000 against normalized average wages in those sectors.[7] While the level of tariffs in China is higher than the United States, what is striking about this graph is how similar the distribution of protection by factor intensity is compared to the United States. Those sectors which employ less-skilled, lower-paid workers more intensively have higher levels of trade protection. This is evident both in the handful of very high tariff sectors but also when considering only those sectors with applied tariff rates below 40%. Under the common empirical claim that China is relatively well-endowed with less-skilled workers, the pattern of protection described in this graph is not easily explained by describing these sectors as losing sectors as in the U.S. case.

There are, nonetheless, reasons that lower-paid sectors might be declining in China. For example, sectors for which state owned enterprises are large employers may be experiencing employment declines as competition increases. More generally, as China develops wages are increasing, which may erode its comparative advantage in some sectors. That said, Figure 2 suggests the possibility that lower-paying and less-skilled intensive sectors are more likely to get greater trade protection in a setting in which we would expect these sectors to generally be comparative advantage industries. This pattern of trade protection has also been noted for several other developing countries in previous research.[8]

[7] The data are for 4-digit, ISIC, revision 3 manufacuturing sectors. The source for the tariff data is again the TRAINS database. The Chinese wage data was obtained from the China Data Centre at the University of Michigan. The original dataset consists of over 500 4-digit industries under the Chinese Industrial Classification System (GB/T 4754 - 1994). We then converted the data into 4-digit ISIC rev.3 based on the concordances in *The People's Republic of China Standards: Industrial Classification for National Economic Activities* (2002).

[8] See, e.g., Hanson and Harrison (1999) for evidence from Mexico, Currie and Harrison (1997) for evidence from Morocco, and Goldberg and Pavcnik (2005) for Colombia and general discussion in Goldberg and Pavcnik (2007). Note, though, that Milner and Mukherjee (2009) argue that the relationship reverses itself in

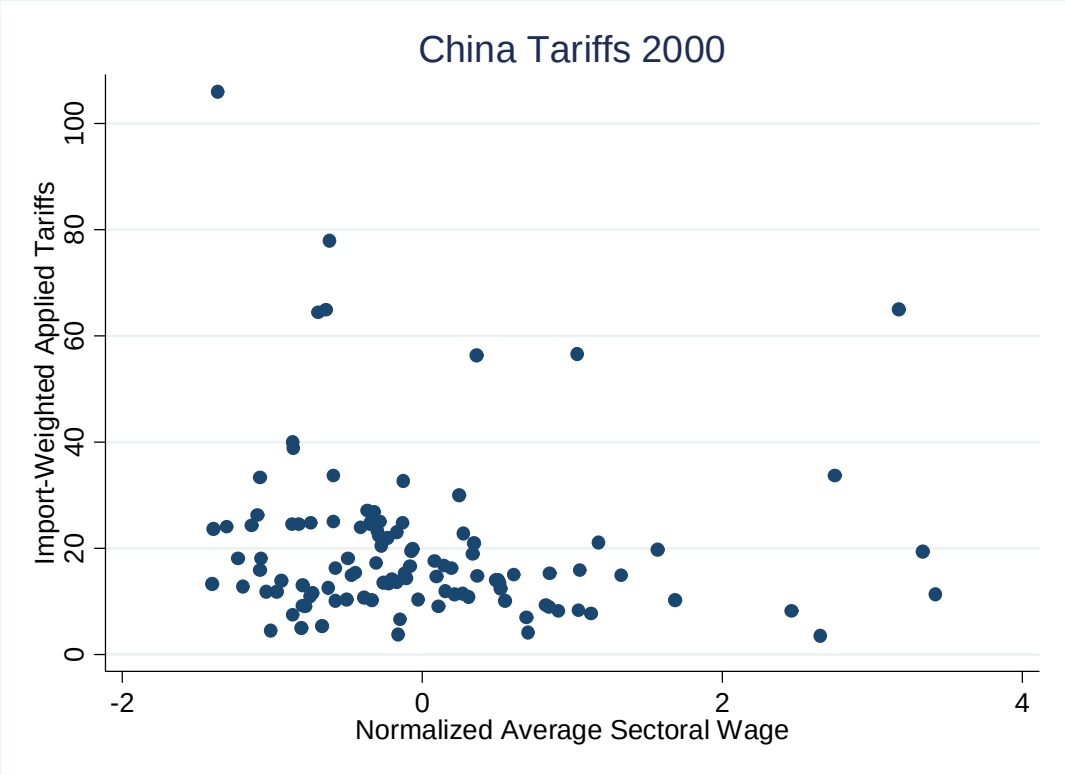

Figure 2: Import-Weighted Applied Tariffs and Average Wages in Chinese Manufacturing in 2000. This figure plots import-weighted applied tariffs in 4-digit, ISIC, Revision 3 manufacturing industries in China in 2000 against normalized average wages in these industries. See text for sources.

To investigate this possibility more systematically, we examine the correlation of trade protection and skill intensity in a large cross-section of countries. Our data for this analysis are from the *Trade, Production and Protection (1976-2004)* World Bank dataset arranged by Alessandro Nicita and Marcelo Olarreaga.[9] This dataset contains variables on trade, production, and protection in 28 manufacturing sectors (3-digit, ISIC rev.2). For each country, we picked a year close to 2001 for which data was available to calculate trade-weighted tariffs and average industry wages. We then calculated Spearman's rank correlation coefficient for the tariff and wage data. Spearman's rank correlation is essentially a Pearson's correlation coefficient on the ranks and average ranks of each variable. A negative Spearman's rank correlation coefficient here indicates that the industry ranks for tariffs and average wages are negatively correlated with lower wage industries receiving relatively greater tariff protection. We report these results for trade-weighted tariffs; the results look quite similar for simple average tariffs.[10]

Figure 3 plots the Spearman rank correlation between weighted tariffs and average wages in 3-digit ISIC, revision 2 manufacturing industries in each country against GDP per capita.[11] The figure reveals two significant patterns in the data. First, for all but two of the countries, the Spearman's rank correlation coefficient is negative indicating that in almost every country industries with lower wages receive greater protection. Second, the magnitude of this correlation does not vary across countries by GDP per capita. If we treat GDP per capita as a rough measure of human/physical capital endowments, this suggests that there is little evidence in this data that comparative advantage is driving the distribution of trade protection across sectors.

Figure 3 presents a puzzle for the literature on trade protection: why do industries that employ lower-paid, less-skilled workers more intensively get greater trade protection across all

transitions to democracy.

[9] See http://go.worldbank.org/EQW3W5UTP0.

[10] The graphs reported also exclude tobacco products for all countries because this sector is almost always a significant outlier in each country. The results are qualitatively similar if tobacco products is included though it does somewhat attenuate the negative correlations.

[11] GDP data is from the most recent Penn World Table, http://pwt.econ.upenn.edu/.

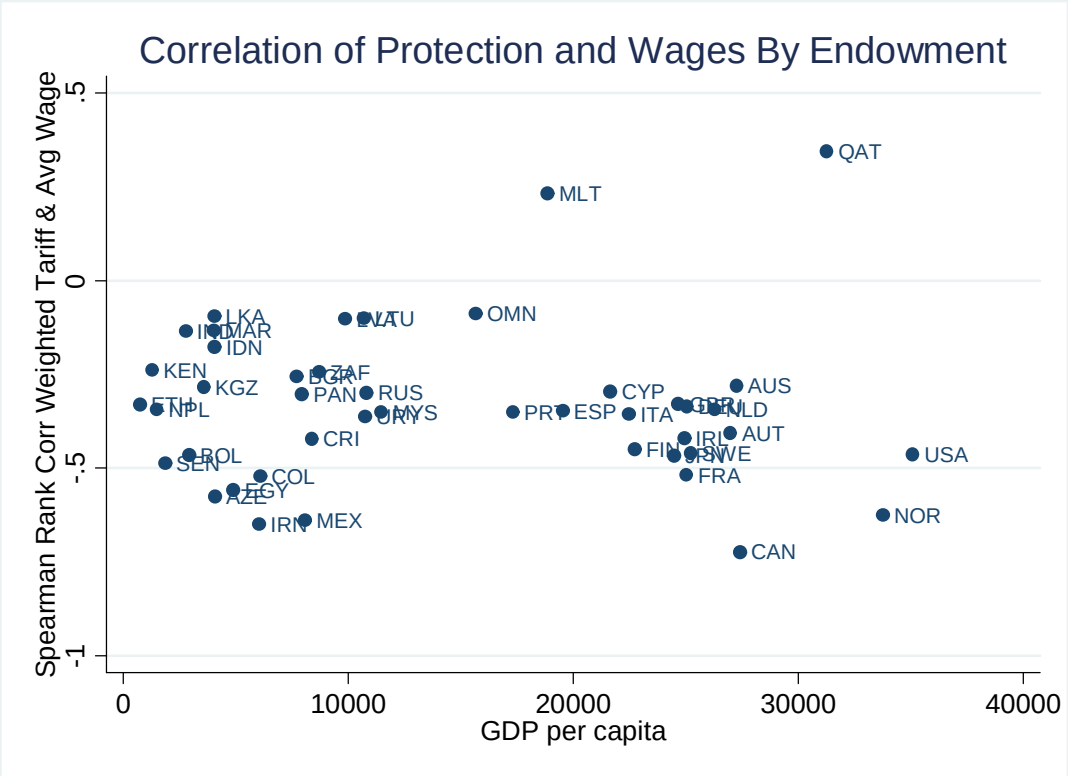

Figure 3: Correlation of Protection and Wages by Endowment. This figure plots the Spearman rank correlation between weighted tariffs and average wages in 3-digit ISIC, revision 2 manufacturing industries in each country against GDP per capita. See text for sources.

types of countries.[12] This pattern of industrial trade protection is puzzling because it holds even in low-income countries in which less-skilled labor is likely to be the relatively abundant factor of production and therefore would be expected in many standard explanations of the determinants of trade policy to receive relatively low, not high, levels of protection.[13]

3 A Social Concerns Model of Trade Protection

The data reviewed in the previous section show that sectors that employ lower-paid, less-skilled workers more intensively receive greater trade protection across countries with very different factor endowments. There are a number of alternative explanations for this pattern of protection. For example, it may be that tariff levels are constrained by GATT and WTO commitments and these policies are dominated by the domestic political interests of relatively wealthy countries for which losing sectors certainly do include industries that employ less-skilled workers more intensively. Another alternative might be that lower paid sectors lobby harder because their opportunity costs for lobbying are lower. Another possibility which we explore is that 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. As a result, policies that support the incomes of low earners are favored in the policymaking process.[14]

A growing literature has explored theoretically and empirically the possibility that some individuals may have other regarding preferences. Sobel (2005), Fehr and Schmidt (2006),

[12] We also examined some alternative ways to investigate the possibility that low-earning, low-skilled sectors generally receive greater levels of trade protection. For example, we calculated the difference between the median trade-weighted tariff in industries with average wages above the median pay industry and the median trade-weighted tariff in industries below the median pay industry and show that this statistic is never positive and mostly negative in our sample countries and that these differences are if anything larger in countries with relatively lower GDP per capita. These patterns are consistent with those reported in Figure 3.

[13] In unreported analyses, we explored the robustness of the correlation between average wages and levels of protection by examining industry panel data for the United States and China between 1998 and 2004. This allowed us to evaluate if within-industry changes overtime in relative skills or earnings are negatively correlated with changes in levels of protection in two countries with very different factor endowments. For a host of regression specifications and estimation techniques that account for a wide range of measurement and endogeneity issues, we indeed find this prediction to hold true. In our Chinese data, a two-standard-deviation increase in an industry's average wage is associated with a 34% decline in that industry's tariff. In our U.S. data, the analogous drop is estimated to be about 45%.

[14] See Goldberg and Pavcnik (2007) for discussion of a couple of other alternative explanations.

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 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.[15] 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 section, we apply the idea of inequality aversion to the problem of trade policy-making. Our argument is 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. Importantly, we suggest the possibility that these preferences will be observed across lots of different types of countries and will influence the observed sectoral distribution of trade protection across countries with very different factor endowments and political institutions.

Our argument is related to an older literature that suggested the possibility that gov-

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

ernments use trade policy to combat inequality. For example, "social change" arguments discussed in Gawande and Krishna (2003), Baldwin (1985), Ball (1967), Constantopoulos (1974) and Corden (1974) are all related to the idea that reducing inequality might be one explanation for why governments in the United States and Europe seem to favor declining sectors that employ less-skilled workers more intensively. More recently, Davidson, Matusz, and Nelson (2006) argue that inequality aversion is important for understanding trade politics. Limao and Panagariya (2007) address the question of why trade policy is biased toward import-competing sectors—and therefore restricts rather than increases trade—and show that this bias may be a consequence of government concern about inequality.

Our theoretical model closely follows standard political economy trade models with the key difference being that individuals in our model care about their own incomes and their incomes relative to others—they are motivated by both envy and altruism.[16] The model focuses on identifying how envy and altruism influence preferences about trade protection in a standard setting, and then we discuss how such preferences may influence policymaking outcomes in diverse institutional settings.

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

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

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, $i = 1, 2, ...n$. 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, we incorporate a social preference term into the in-

[16] Specifically, we adopt the same assumptions and notation for the economic environment as in Grossman and Helpman (1994) except for the specification of individual utility functions.

dividual'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 we 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 we 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. We 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. We 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 $I_i \geq x_0 + \sum_{i=1}^{n} p_i x_i$. We also 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

$$r(\mathbf{p}) = \sum_{i=1}^{n} (p_i - p_i^*)[d_i(p_i) - \frac{1}{N} y_i(p_i)] \tag{2}$$

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 $y_i(p_i) = \pi_i'(p_i)$. $\mathbf{p} = (p_1, p_2, ...p_n)$ 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, we can derive individuals'

indirect utility in sector i as follows:

$$\begin{aligned} Z_i(\mathbf{p}) &= 1 + \frac{\pi_i(p_i)}{\phi_i N} + r(\mathbf{p}) + s(\mathbf{p}) - \frac{\alpha}{n-1}\sum_{i\neq j}\max\{\frac{\pi_j(p_j)}{\phi_j N} - \frac{\pi_i(p_i)}{\phi_i N}, 0\} \\ &\quad -\frac{\beta}{n-1}\sum_{i\neq j}\max\{\frac{\pi_i(p_i)}{\phi_i N} - \frac{\pi_j(p_j)}{\phi_j N}, 0\} \end{aligned} \tag{3}$$

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:

$$\frac{\partial Z_i}{\partial p_j} = \frac{1}{N}[(p_j - p_j^*)m_j'(p_j) - y_j(p_j)] - \frac{\alpha}{n-1}\frac{y_j(p_j)}{\phi_j N} \quad \text{if } \frac{\pi_j(p_j)}{\phi_j N} > \frac{\pi_i(p_i)}{\phi_i N} \ \&\ i \neq j \tag{4a}$$

$$\frac{\partial Z_i}{\partial p_j} = \frac{1}{N}[(p_j - p_j^*)m_j'(p_j) - y_j(p_j)] + \frac{\beta}{n-1}\frac{y_j(p_j)}{\phi_j N} \quad \text{if } \frac{\pi_j(p_j)}{\phi_j N} < \frac{\pi_i(p_i)}{\phi_i N} \ \&\ i \neq j \tag{4b}$$

$$\frac{\partial Z_i}{\partial p_j} = y_j(p_j) + \frac{1}{N}[(p_j - p_j^*)m_j'(p_j) - y_j(p_j)] + [(n-i)\frac{\alpha}{n-1} - (i-1)\frac{\beta}{n-1}]\frac{y_j(p_j)}{\phi_j N} \text{ if } i = j \tag{4c}$$

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 $y_i(p_i) = \pi_i'(p_i) > 0$. We 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. Our empirical work will test this central feature of our 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.

This model identifies how envy and altruism influence policy preferences about trade protection in a standard setting and provides clear empirical predictions that we will evaluate in the next section of the paper. It is straightforward to see that the preferences described in our model would tend to push policy outcomes in a direction for which lower-earning industries tend to receive higher levels of protection under a number of alternative assumptions about the policymaking process—that is inequality aversion constitutes one possible answer to the empirical puzzle documented in Section 2.

For example, suppose policy is chosen by a single individual in the society with the preferences described above. This policymaker could be a citizen from the median industry, or an individual elected to office for reasons unrelated to trade policy, or a leader in a non-democratic political regime. The exact policy selected for each industry by such a leader will depend on the individual's position in the income distribution and the relative magnitude of the parameters in the model. That said, lower-paying industries are more likely to benefit from the policymaker's altruism and less likely to be punished by his or her envy yielding a pattern of greater protection for lower-paying industries.

Another relatively simple way to think about the policy implications of our model of preferences is to consider the case of a social welfare maximizing planner. In this setting, aggregate envy toward workers in a sector will tend to lower protection in an industry while aggregate altruism towards workers in a sector will tend to raise protection in a sector. Lower-earning sectors will have lower levels of aggregate envy and higher levels of aggregate altruism

and thus will be more likely to be protected than higher-earning sectors.[17] Many political economy models of trade are, in effect, models for which a policymaker weighs aggregate welfare against some other gain such as lobbying contributions. To the extent that aggregate welfare is influential at all in the policymaking process, inequality aversion is likely to push policy toward greater protection for lower-earning sectors and less for higher-earning sectors.

One such political economy model is Grossman and Helpman's "protection for sale" theory. This model is particularly instructive because it has been applied both theoretically and empirically to countries with diverse political institutions and levels of economic development. For example, policymakers in both democratic and non-democratic settings have incentives to weigh aggregate welfare whether to win elections or to prevent revolutions or coups. As such, inequality aversion can explain why low-earning sectors are more heavily protected across countries with diverse political institutions. Importantly, however, in the Grossman and Helpman model, the extent to which policymakers care about aggregate welfare is only one mechanism by which inequality aversion privileges low-earning industries. Aggregate envy and altruism among organized sectors making contributions to the policymaker will also tend to result in higher protection in lower-earning industries even if the policymaker does not value aggregate welfare. This is an important insight because it suggests one reason why even if there are differences across political institutions in the extent to which policy is made in the interests of citizens—or how much aggregate welfare is influential in policymaking—we would still expect envy and altruism among citizens to move policy toward more protection in lower-earning industries. While it is certainly the case, that the introduction of inequality aversion might have different consequences under alternative assumptions about either the economy or the political process, there are a wide variety of economic and political settings under which inequality aversion would tend to push both individual preferences and policy equilibria toward great protection for lower-earning sectors of the economy.

[17] In this very simple economic setting, a welfare maximizing policymaker would choose no tariffs for many sectors, but depending on the relative magnitude of the model's parameters, some sectors would receive protection and those sectors would be low-earning sectors with high aggregate altruism and low aggregate envy.

4 Envy and Altruism in Trade-Policy Preferences

Section 2 presented evidence that sectors employing lower-paid, less-skilled workers more intensively receive more protection across countries with diverse factor endowments and suggested that this pattern of protection was not well accounted for in existing political economy models. Section 3 argued that one possible explanation for this pattern of protection is that individual preferences over trade policy are shaped by attitudes about inequality—both envy and altruism—and demonstrated how both these factors imply relatively greater support for policies that protect industries employing lower-earning workers more intensively.

In this section we use national samples of citizens in China and the United States to provide two critical empirical tests in support of our model. First, we show that preferences aggregated across all respondents in each country vary systematically with the treatment income of industry workers: industries with lower-income workers receiving broader support for trade protection. Second, we derive from our model and estimate an equation of policy preferences, and we find that individuals have the social preferences of altruism and envy assumed in our model in Section 3. Econometrically identifying these preferences lends considerable support to our explanation of the trade-policy puzzle documented in Section 2.

4.1 Experimental Design

The main objective of our empirical analysis is to determine if individual policy preferences about sector-specific trade protection exhibit inequality aversion and, specifically, to estimate separately the envy and altruism parameters in the model presented in Section 3. Recall from Equations (4a)-(4c) that a trade-policy induced increase in another sector's price affects individual utility (or sectoral utility since all individuals within a sector are assumed to be the same) through three channels. First, it decreases the consumer surplus but increases tariff revenue. Under standard assumptions, the net impact of these two effects is negative. Absent social concerns, individuals in other sectors are worse off from trade protection. Second, if the individual has a lower income than the sector under consideration for trade protection, he or she suffers an additional loss from envy. Third, if the individual has a higher income than

the sector under consideration for trade protection, he or she benefits from a trade-policy induced increase in another sector's price because of altruism.

To estimate the effect of envy and altruism on support for sector-specific trade protection, we designed a survey experiment that randomly assigned respondents to consider trade protection for industries with different wage levels and recorded their support for sector-specific trade protection. In China, the experiment was conducted in face-to-face interviews for a national sample of the Chinese adult population living in major cities and county-level cities.[18] In the United States, the experiment was conducted over the internet for a nationally representative sample of the U.S. adult population.[19] [20]

The English translation of the question that we asked to elicit support for sector-specific trade protection in China was:

> There is an industry in China in which the average worker makes X yuan per month. To increase the wages of workers in this industry, some people want the government to limit imports of foreign products in this industry. Others oppose these limits because such limits would raise prices that consumers pay and hurt other industries. Do you favor or oppose limiting the import of foreign products in this industry?
>
> IF FAVOR: Do you strongly favor or only somewhat favor limiting the import of foreign products in this industry?
>
> IF OPPOSE: Do you strongly oppose or only somewhat oppose limiting the import of foreign products in this industry?

The question that we asked to elicit support for sector-specific trade protection in the United States 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?

[18] The experiment was conducted by the Horizon Research Consultancy Group.

[19] The experiment was conducted by Knowledge Networks as part of their QuickView studies employing respondents from their KnowledgePanel. For more information, see `www.knowledgenetworks.com`.

[20] Both experiments were reviewed and granted exemptions by Yale University's Faculty of Arts and Sciences Human Subjects Committee.

IF FAVOR: Do you strongly favor or only somewhat favor new trade barriers for this industry?

IF OPPOSE: Do you strongly oppose or only somewhat oppose new trade barriers for this industry?

The value of X was assigned randomly across respondents to be equal to 1,000, 2,000, or 4,000 yuan in China and 18,000, 40,000, or 80,000 dollars in the United States. These values were chosen so that respondents were considering trade protection for low, average, and high wage industries. For example, in the U.S., the low value of $18,000 corresponds to an income a bit higher than the total money income in 2007 for an adult who worked full-time, year-round at the 10th percentile in the income distribution.[21] 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. The values for China correspond to points in the 2007 monthly Chinese wage distribution similar to those used for the United States.[22] [23]

It is important to compare the wording of our 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, our wording implies that the industry in question is not the industry in which the respondent works. We chose our question wording to correspond with the empirical puzzle of this paper which is focused on the distribution of protection across industries and with our theoretical model which assumes both that returns—income—to workers and policy setting is determined by

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

[22] See National Bureau of Statistics of China (2008) China Statistical Yearbook, Beijing: China Statistics Press.

[23] Note that the slight difference in the English translation of the Chinese question arose from back translation and pilot testing of the original U.S. question.

industry.

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. This is most clearly the case for the United States for which there is a long record of polling public opinion about trade policy. In our U.S. survey, just 30.9% of respondents favor new trade barriers while nearly 70% of respondents are opposed (44% favor limiting imports with 56% opposed in the Chinese data).[24] 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.

4.2 Experimental Results

Our first set of empirical results report the basic findings from the experiment—that is the effect of variation in the assumed average wage of the industry under consideration for trade protection on support for sector-specific trade protection.

We constructed two measures of support for new trade barriers based on responses to our 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

[24] Descriptive statistics are based on weighted averages though these differed little from the unweighted averages.

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.

For China, support for limiting the import of foreign products is 7 percentage points higher (a 16% 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 of a similar magnitude 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 results thus suggest for China a significant difference between respondents receiving the low wage treatment and both the middle and high wage treatments but no difference between the middle and high treatments.

In the United States, the results are even more striking. Support for new trade barriers is 8 percentage points higher (a 26% 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 nearly 19 percentage points (an over 90% 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. It is clear that support for sectoral trade protection is decreasing in the average wages of the sector under consideration for trade protection.

Table 2 reports estimates of the differences across our treatment categories controlling for various demographic characteristics of respondents and fixed effects for geographical location, industry of employment, and interviewer. This framework allows identification of the treatment effects within geographical location, industry, and other respondent characteristics. We estimate the following ordinary least squares regressions:

$$TradeOpinion1_{i,k,j,l} = \pi_0 + \pi_1 MWT_{i,k,j,l} + \pi_2 HWT_{i,k,j,l} + \Pi X_{i,k,j,l} + \delta_k + \eta_j + \lambda_l + \epsilon_{i,k,j,l} \quad (5)$$

where the dependent variable *Trade Opinion 1* is the dichotomous measure described above and is increasing in support for trade protection;[25] *MWT, Middle Wage Treatment,* is a dichotomous measure equal to one if the respondent received the middle wage treatment for that country and zero otherwise; *HWT, High Wage Treatment,* is a dichotomous measure equal to one if the respondent received the high wage treatment for that country and zero otherwise; X is a vector of demographic variables measuring education attainment, sex, age, and income;[26] δ_k are fixed effects for geographical location;[27] η_j are fixed effects for industries;[28] λ_l are fixed effects for interviewers (China only); ϵ is the error term; i, k, j, and l index individuals, geographic locations, industries, and interviewers 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 2 closely mirror those discussed for Table 1 without control variables. For both countries, Model 1 excludes industry fixed effects and Model 2 includes them. For China, exposure to the *Middle Wage Treatment* decreased the probability of giving a protectionist response by about 7 percentage points compared to exposure to the *Low Wage Treatment*. This estimate is quite similar across Models 1 and 2. The estimated difference for the *High Wage Treatment* is between 5 and 6 percentage points across the two specifications. This again suggests that there is no difference between the middle and high wage treatments. It is worth noting the stability of these estimates 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 variable. For the United States, the differences

[25] The results are qualitatively similar employing the *Trade Opinion 2* measure.

[26] The 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 monthly (China) or annual (U.S.) income (see below for further details on the construction of this variable).

[27] These are cities and counties in China and states in the U.S.

[28] These industry dummy variables are fairly aggregated in our Chinese data and include about 20 categories. For the United States, we recorded the industry of employment for each working respondent using the North American Industry Classification System at the three-digit level and there are over 100 industries in our data.

across the treatments are statistically and substantively significant across all combinations and the magnitudes are quite close to those reported in Table 1. Again, this is true even in the case for Model 2 for which the industry fixed effects result in a great deal of missing observations.

These experimental results in Tables 1 and 2 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. The result further provides evidence for one possible set of explanations for why low-earning, less-skilled industries tend to be more heavily protected across countries with different factor endowments and political institutions: citizens, for whatever reason, prefer to support the incomes of low-wage sectors more than high-wage sectors and this preference is influential in the policymaking process. More generally, this finding is consistent with our specific explanation why low-earning, less-skilled industries tend to be more heavily protected across lots of different countries: inequality-averse citizens prefer to support the incomes of low-wage sectors more than high-wage sectors. This interpretation, however, should be made with some caution. First, these estimates do not provide direct evidence of envy and/or altruism as defined in our model. Second, there may be alternative reasons why trade opinions vary with the average wage of the industry under consideration for protection. Consequently, our interpretation of Tables 1 and 2 is that they report evidence consistent with our argument though there could be other related factors driving preferences in a similar direction. They do, nonetheless, constitute strong evidence that preferences may be important in accounting for the puzzle of low-earning industries receiving more trade protection across many countries. We now turn to more direct evidence of altruism and envy in policy opinions about sectoral trade protection.

	Mean Estimates by Treatment Category			Difference Estimates		
China						
	Low Wage 800Y	**Middle Wage 2,000Y**	**High Wage 4,000Y**	**Low-Middle**	**Low-High**	**Middle-High**
Trade Opinion 1	0.485	0.418	0.435	0.067	0.051	-0.016
	(0.018)	(0.017)	(0.017)	(0.025)	(0.025)	(0.024)
				0.006	0.040	0.504
Trade Opinion 2	2.477	2.405	2.403	0.072	0.074	0.002
	(0.028)	(0.026)	(0.027)	(0.038)	(0.039)	(0.037)
				0.059	0.057	0.954
Number of Observations	814	825	817			
United States						
	Low Wage $18,000	**Middle Wage $40,000**	**High Wage $80,000**	**Low-Middle**	**Low-High**	**Middle-High**
Trade Opinion 1	0.392	0.310	0.205	0.082	0.187	0.105
	(0.018)	(0.017)	(0.015)	(0.024)	(0.023)	(0.022)
				0.001	0.000	0.000
Trade Opinion 2	2.311	2.133	1.963	0.178	0.348	0.170
	(0.032)	(0.031)	(0.031)	(0.045)	(0.045)	(0.044)
				0.000	0.000	0.000
Number of Observations	762	767	736			

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.

	Ordinary Least Squares Estimates			
	China		United States	
	Model 1	**Model 2**	**Model 1**	**Model 2**
Middle Wage Treatment	-0.068	-0.072	-0.089	-0.075
	(0.024)	(0.027)	(0.025)	(0.037)
	0.005	0.007	0.000	0.043
High Wage Treatment	-0.054	-0.059	-0.198	-0.164
	(0.024)	(0.028)	(0.024)	(0.036)
	0.025	0.032	0.000	0.000
Demographic Controls	Yes	Yes	Yes	Yes
Local/State Fixed Effects	Yes	Yes	Yes	Yes
Industry Fixed Effects	No	Yes	No	Yes
Interviewer Fixed Effects	Yes	Yes	NA	NA
Standard Error of Regression	0.470	0.469	0.453	0.453
Observations	2,441	1,997	2,097	1,111

Table 2: Estimated Effect of Average Wage of Industry on Support for Trade Protection, Linear Probability Model Estimates. The table reports for China and the United States 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.

4.3 Estimation of Envy and Altruism Parameters

To derive our statistical model for estimating the effect of envy and altruism on support for sector-specific trade protection, we start with the individual indirect utility function in our model, Equation (3):

$$\begin{aligned} Z_i(\mathbf{p}) &= 1 + \frac{\pi_i(p_i)}{\phi_i N} + r(\mathbf{p}) + s(\mathbf{p}) - \frac{\alpha}{n-1}\sum_{i\neq j}\max\{\frac{\pi_j(p_j)}{\phi_j N} - \frac{\pi_i(p_i)}{\phi_i N}, 0\} \\ &\quad -\frac{\beta}{n-1}\sum_{i\neq j}\max\{\frac{\pi_i(p_i)}{\phi_i N} - \frac{\pi_j(p_j)}{\phi_j N}, 0\} \end{aligned} \tag{6}$$

In order to estimate the parameters of this model, we need to 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 our model.

$$\begin{aligned} Z_i(\mathbf{p}) &= 1 + \frac{\pi_i(p_i)}{\phi_i N} + r(\mathbf{p}) + s(\mathbf{p}) - \frac{\alpha}{n-1}\sum_{i\neq j}\max\{\frac{\pi_j(p_j)}{\phi_j N} - \frac{\pi_i(p_i)}{\phi_i N}, 0\} \\ &\quad -\frac{\beta}{n-1}\sum_{i\neq j}\max\{\frac{\pi_i(p_i)}{\phi_i N} - \frac{\pi_j(p_j)}{\phi_j N}, 0\} + \epsilon_i \end{aligned} \tag{7}$$

We assume that ϵ_i is normally distributed and that it enters the function additively. We further simplify our model in three ways. First, we 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 our estimating equation. Second, the survey question forces respondents to focus on one industry at a time and so we 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 leave us with:

$$Z_i(\mathbf{p}) = I_i - \alpha[\max\{I_j - I_i, 0\}] - \beta[\max\{I_i - I_j, 0\}] + \epsilon_i \text{ where } i \neq j \tag{8}$$

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 We assume that our survey respondents answer our 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:

$$P(Y = 1) = \Phi(\gamma_0 - \alpha[\max\{I_j - I_i, 0\}] - \beta[\max\{I_i - I_j, 0\}]) \tag{9}$$

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. In both our surveys, we also measured annual personal income. In China, the survey instrument places individuals into one of 16 monthly personal income categories. We 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 our measure of I_i. For the United States, our survey assigned respondents to one of 19 annual personal income categories and we constructed the variable *Personal Income* in the same way as for the China data. The variable *Other Income* is equal to treatments in our survey questions and takes on the three randomly assigned values of 1,000, 2,000, or 4,000

yuan in China and 18,000, 40,000, or 80,000 dollars in the United States. This variable serves as our measure of I_j. We 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. We 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.[29] Thus, we have measures of each argument in Equation (9) and our initial estimating equation is:

$$P(Y = 1) = \Phi(\gamma_0 + \alpha Envy + \beta Altruism) \tag{10}$$

We estimate this equation as a probit model and report heteroskedastic consistent standard errors.[30] The first key hypothesis from our 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 (4a) above). The second main hypothesis from our 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 (see Equation (4b) above). In short, new trade barriers increase or decrease inequality depending on your own income and thus the direction of our envy and altruism parameters, although both indicating a form of inequality aversion, are in opposite directions.[31]

Our initial specification follows directly from our theoretical framework. Given that our 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

[29] All of these variables are measured in thousands.

[30] The 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. Our results below are qualitatively similar in these alternative specifications. We also calcluated bootstrap standard errors and found little difference in the magnitudes of our standard errors.

[31] We note that our estimates of the envy and altruism parameters investigate whether the data from the experiment are consistent with our theoretical framework. It is possible that an alternative theory, perhaps an alternative theory of other regarding preferences would explain the data as well. We note though that the results described below are more consistent with inequality aversion—envy and altruism—than a pure altruism account.

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, we 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 we 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 our estimates of the *Envy* and *Altruism* parameters and yields consistent estimates of the parameters even if the model is incomplete.[32] For this reason, although we report results for the initial specification, we focus attention on the models that include *Personal Income*, *Personal Income Greater*, and their interaction as controls. We also present additional results which add control variables to this second specification.

Table 3 reports our main results for China. The estimates for Model 3 are for our initial specification, Equation (10). The estimates for both envy and altruism are small in magnitude and statistically insignificant. As 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

[32]Note that one potential concern is if there are heterogeneous treatment effects from the different components of the *Envy* and *Altruism* variables (see Dunning 2008 for a related discussion), this specification would only estimate the effect from the *Other Income* component of *Envy* and *Altruism.*

	Probit Model Estimates			
	Model 3	**Model 4**	**Model 5**	**Model 6**
	Coefficient Estimates	**Coefficient Estimates**	**Coefficient Estimates**	**Coefficient Estimates**
Envy, α	-0.004	-0.022	-0.017	-0.018
	(0.024)	(0.030)	(0.032)	(0.040)
	0.856	0.470	0.593	0.663
Altruism, β	-0.002	0.159	0.188	0.189
	(0.021)	(0.055)	(0.060)	(0.062)
	0.925	0.004	0.002	0.002
Personal Income, γ_1		-0.039	0.005	-0.044
		(0.040)	(0.048)	(0.063)
		0.326	0.910	0.485
Personal Income Greater, γ_2		0.089	0.220	0.150
		(0.120)	(0.136)	(0.166)
		0.462	0.106	0.366
*Personal Income Greater**		-0.111	-0.172	-0.140
Personal Income, γ_3		(0.063)	(0.070)	(0.081)
		0.077	0.015	0.083
Demographic Controls	No	No	Yes	Yes
Local Fixed Effects	No	No	Yes	Yes
Industry Fixed Effects	No	No	No	Yes
Interviewer Fixed Effects	No	No	Yes	Yes
Log-likelihood	-1679.2	-1673.4	-1434.9	-1135.3
Observations	2,442	2,442	2,401	1,912

Table 3: Envy, Altruism, and Support for Trade Protection in China, 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.

	Probit Model Estimates			
	Model 3	**Model 4**	**Model 5**	**Model 6**
	Coefficient Estimates	**Coefficient Estimates**	**Coefficient Estimates**	**Coefficient Estimates**
Envy, α	-0.009	-0.010	-0.010	-0.012
	(0.001)	(0.002)	(0.002)	(0.003)
	0.000	0.000	0.000	0.000
Altruism, β	-0.003	0.010	0.010	0.007
	(0.001)	(0.004)	(0.004)	(0.004)
	0.012	0.004	0.004	0.139
Personal Income, γ_1		-0.006	-0.005	-0.006
		(0.002)	(0.002)	(0.003)
		0.003	0.016	0.110
Personal Income Greater, γ_2		0.268	0.219	0.028
		(0.140)	(0.143)	(0.235)
		0.056	0.125	0.905
Personal Income Greater $*$		-0.008	-0.007	-0.002
Personal Income, γ_3		(0.004)	(0.004)	(0.005)
		0.033	0.063	0.765
Demographic Controls	No	No	Yes	Yes
State Fixed Effects	No	No	Yes	Yes
Industry Fixed Effects	No	No	No	Yes
Log-likelihood	-1270.6	-1254.9	-1221.6	-566.3
Observations	2,097	2,097	2,091	999

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.

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 4 specification in Table 3 addresses this issue by adding the variables *Personal Income*, *Personal Income Greater* and their interaction. Once we add these controls, variation in the *Envy* and *Altruism* variables is driven only by the random assignment of the *Other Income* treatments from the survey experiment and so we can be confident our estimates are not biased by omitted unobserved factors influencing trade opinions.

The estimates for Model 4 indicate that the estimates for both envy and altruism are correctly signed but that only the estimate for altruism is statistically and substantively significant (the probit coefficient estimate for β is 0.159 with a standard error of 0.055). This indicates, that all else equal, individuals with incomes greater than the income of the average worker in the industry under consideration for protection are more supportive of sector-specific trade barriers, the greater their income is relative to the income of workers in the industry which may be protected. To get a sense of the magnitude of this effect, the impact 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 protection—to 2.68—a two standard deviation increase equivalent to an income difference of 2,680 yuan—on the probability of supporting new trade barriers, holding all other variables at their means is 0.165 (standard error of 0.057). This means that the probability of favoring new trade barriers increases 16.5 percentage points, which is over a 37% increase from the overall mean of the *Trade Opinion 1* measure.[33]

Table 3 also reports two additional specifications which add various control variables to Model 4. The Model 5 specification adds the variables *College Grad, Female,* and *Age* defined above and fixed effects for geographical location and interviewer while the Model 6 specification also adds fixed effects for industry of employment. Not surprisingly, given the design of the experiment, our estimates of the envy and altruism parameters α and β in

[33]This estimate was calculated by simulating from the sampling distribution of the probit parameter estimates, following the procedures described in King, Tomz, and Wittenberg (2000),

Models 5 and 6 are quite similar to those reported for Model 4. Overall, the estimates in Table 3 provide robust evidence that in China, altruism has a positive effect on support for trade protection.

Table 4 reports our main results for the U.S. The estimates for Model 3 indicate negative and statistically significant coefficients for both the *Envy* and *Altruism* variables. The *Envy* result is consistent with our theoretical expectations while the *Altruism* estimate is not. However, as discussed in the results for China, this specification follows from the theoretical model but is likely biased given what we know about determinants of trade policy opinions and the assignment of the *Personal Income* component of the *Envy* and *Altruism* variables. The Model 4 specification in Table 4 addresses this potentional problem by adding the variables *Personal Income*, *Personal Income Greater* and their interaction. Once we add these controls, variation in the *Envy* and *Altruism* variables is driven only by the random assignment of the *Other Income* treatments from the survey experiment and so we can be confident that our estimates are not biased by the omission of unobserved factors influencing trade opinions.

The results for Model 4 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 -0.010 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 48.8—a two standard deviation increase equivalent to an income difference of $48,800—on the probability of supporting new trade barriers, holding all other variables at their means is -0.163 (standard error of 0.025). This means that the probability of favoring new trade barriers falls 16.3 percentage points, which is almost a 53% decrease from the overall mean of the *Trade Opinion 1* measure.

The estimated probit coefficient, β, for the variable *Altruism* is equal to 0.010 with a standard error of 0.004. 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 48.4—a two standard deviation increase equivalent to an income difference of $48,400—on the probability of supporting new trade barriers, holding all other variables at their means is 0.182 (standard error of 0.065). This means that the probability of favoring new trade barriers increases 18.2 percentage points, which is about a 59% 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 4. The Model 5 specification adds the variables *College Grad, Female,* and *Age* defined above and fixed effects for the state of the respondent. The Model 6 specification also adds fixed effects for industry of employment.[34] Our 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 our estimates because conditional on *Personal Income*, *Personal Income Greater,* and their interaction, variation in *Envy* and *Altruism* is randomly assigned and thus uncorrelated with our measures of 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 in our U.S. data.

Taken together the results in both China and the United States strongly support the overall argument of this paper. One reason that lower-earning sectors receive more trade protection around the world may be that citizens support trade protection more for low-earning sectors. This support could obviously be influential in a democratic setting but it could also be influential in an environment in which special interests dominate—whether it be in a democratic or non-democratic regime. Furthermore, when we combine our model

[34] The addition of the industry dummy variables decreases the number observations even more than in the analyses reported in Table 2 because the probit model drops from the analysis any observations for which an industry dummy variable perfectly predicts opinion.

with our experiment, our empirical results are consistent with inequality aversion—in the form of envy and altruism—accounting for why individuals are more supportive of protection for lower-earning sectors.

4.4 Envy, Atruism, and Inefficient Policy

One of the distinctive features of trade policy is that it is an inefficient policy instrument for redistributing income. In fact, why governments use trade policy at all to redistribute income when other policies could do so more efficiently is a central question in the international political economy literature. To explore further the importance of inequality aversion in understanding trade policy preferences, and perhaps shed some light on why individual citizens support costly redistribution, we conducted a small follow-up experiment with a subset of our U.S. respondents. We asked the following question immediately after the respondents answered the initial trade question analyzed above:

> Considering this same industry in which the average worker makes X dollars per year, economists have estimated that to raise this worker's salary by 5,000 dollars per year through new trade barriers such as import taxes and quotas, it would cost Y dollars per year to the US economy in terms of higher consumer prices and higher costs for other industries for each worker helped. Do you still 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 set equal to the same value initially assigned to that respondent (18,000, 40,000, or 80,000 dollars) in our main question described above and the value of Y was set equal to either 5,000 dollars for the efficient redistribution or 7,500 for the inefficient redistribution. This experiment allows us to investigate whether the pattern of trade preferences that we observe in our main experiment remain even when the inefficiency of the policy is made salient to respondents.[35] The evidence presented thus far already suggests

[35] One caveat which should be kept in mind in thinking about this second experiment is that our survey respondents may have a tendency to stick to their original policy opinion in order to remain consistent in their

that inequality aversion helps explain support for inefficient redistributive trade policy, but our second experiment makes the inefficiency unambiguous.

Table 5 presents the key results from this experiment, focusing on the results for the variable *Trade Opinion 3* which records support for increased trade barriers as a 1 and codes opposition as a 0. The first panel reports the mean estimates and standard errors for those respondents that received the efficient prime of $5,000 and for those that received the inefficient prime of $7,500. Making the inefficiency of trade policy more salient moderately reduces support for protection from 0.28 to 0.24 of respondents. Given the sample size in this second experiment, this difference has a p-value of 0.13 (the difference for the full ordered responses has a p-value 0.04).

Our main interest is in whether our results indicating the importance of social concerns in opinion formation about trade are robust when individuals are primed about the inefficiency of trade policy. The second panel in Table 5 reports the differences across treatment groups under the efficient and inefficient prime. Crucially, the estimates under the inefficient prime are 0.115, 0.182, and 0.067 for the low-wage minus middle-wage treatment, the low-wage minus high-wage treatment, and middle-wage minus high-wage treatment respectively. These differences are in the predicted direction, are of similar magnitudes as in our main experiment, and are statistically signficant at the 0.01, 0.00, and 0.11 levels. Under the efficient policy prime, the results indicate a significant difference between the low and high-wage treatments and middle and high-wage treatments but not between the low and middle-wage treatments. Thus, if anything, the average wage of workers in the industry under consideration is more important for understanding preferences when the inefficiency of the policy is salient. This strengthens our interpretation that our main results indicate that social concerns are important for understanding why individuals are more or less likely to support costly redistributions. The third panel in Table 5 reports the regression estimates for the *Middle Wage Treatment* and *High Wage Treatment* variables.employing the Model 1

views. We note, though, that almost 20% of our respondents changed positions from support to opposition or vice-versa. Further, as we discuss below there is heterogeneity in our results across the efficient and inefficient prime suggesting individuals were willing to respond to the new information.

	Efficient		Inefficient	
	Estimate	**S.E.**	**Estimate**	**S.E.**
Mean	0.277	(0.019)	0.236	(0.019)
Observations	530		525	
	Difference Estimates			
	Efficient		**Inefficient**	
	Estimate	**S.E.**	**Estimate**	**S.E.**
Low Treatment - Middle Treatment	0.016	(0.049)	0.115	(0.047)
Low Treatment - High Treatment	0.119	(0.047)	0.182	(0.045)
Middle Treatment - High Treatment	0.102	(0.046)	0.067	(0.042)
	OLS Estimates of Treatment Effects			
	Efficient		**Inefficient**	
	Estimate	**S.E.**	**Estimate**	**S.E.**
Middle Wage Treatment	0.008	(0.052)	-0.149	(0.052)
High Wage Treatment	-0.099	(0.055)	-0.209	(0.050)
Standard Error of Regression	0.439		0.427	
Observations	481		493	
	Probit Estimates of Envy and Altruism			
	Efficient		**Inefficient**	
	Estimate	**S.E.**	**Estimate**	**S.E.**
Envy, α	-0.004	(0.003)	-0.008	(0.004)
Altruism, β	-0.002	(0.007)	0.009	(0.008)
Log-likelihood	-280.0		-259.7	
Observations	481		493	

Table 5: Support for Trade Protection Under Efficient and Inefficent Prime. This table reports descriptive statistics and regression analyses for the variable *Trade Opinion 3* under the efficient prime of $5,000 and the inefficient prime of $7,500. The difference estimates report difference-in-means tests assuming unequal variances. The regression estimates adopt the Model 1 specification from Table 2 and the probit estimates employ the Model 4 specification from Table 4.

specification which includes demographic controls and state fixed effects. These estimates confirm the pattern observed in the difference estimates.

The fourth and final panel in Table 5 presents probit estimates of the envy and altruism parameters employing our Model 4 specification. Again, focusing our attention on the estimates for the respondents who received the inefficient prime, we find our estimates quite similar to those reported in Table 4. The estimate for the envy parameter is -0.008 (with a standard error of 0.004) compared to the Table 4 estimate of -0.010. The altruism estimate is 0.009 compared to 0.010 in Table 4. However, the altruism estimate here is imprecisely estimated with a standard error almost as large as the coefficient.[36] Again, when we compare these estimates across the efficient and inefficient prime, the results suggest, if anything, envy and altruism are more important for understanding policy opinions when it is salient that the policy is inefficient.

5 Conclusion

Trade and economic policymaking more generally foment so much political activity and theatre because of the significant distributional consequences at stake. One important class of explanations for why governments adopt policies that support the incomes of some citizens but not others is that these polcies reflect the preferences of particular actors—voters, industry lobbies, politicians, etc.—in the policymaking process. An essential element of any explanation of policy outcomes is what accounts for the preferences of the relevant actors. In trade and virtually all areas of economic policymaking, self-interest—how policy affects an individual's economic welfare—is a compelling place to start in explaining support for policy alternatives.

Nonetheless, this does not preclude the possibility that economic policy preferences are also influenced by other-regarding preferences. Our paper investigates the possibility that social concerns influence policy opinions in trade, an important area of economic policymak-

[36] Given the smaller sample sizes here, we would emphasize the similarities in the magnitude of the estimates rather than imprecision of the altruism estimate.

ing, and that these preferences may help explain policy outcomes not easily accounted for by exisiting theories.

Specifically, we address the question of why in so many countries lower-earning, less-skilled intensive industries receive relatively high levels of trade protection. What is especially puzzling is that this pattern of protection holds even in low-income countries in which less-skilled labor is likely to be the relatively abundant factor of production and therefore would be expected in many standard political-economy frameworks to receive relatively low, not high, levels of protection.

We offer an explanation of this puzzle: individual preferences that display inequity aversion. Under a variety of models of the policymaking process, inequity aversion on the part of individual citizens would make it more likely that governments favor lower-earning, less-skilled intensive industries in setting trade policy. To provide empirical evidence in support of our explanation, we analyze policy preferences in national samples of citizens in China and the United States. First, we show that preferences aggregated across all respondents in each country vary systematically with the treatment income of industry workers: industries with lower-income workers receive broader support for trade protection. Second, we derive from our model and estimate an equation of policy preferences, finding that individuals have the social preferences of altruism and envy assumed in our model. Econometrically identifying these preferences lends considerable support to our explanation of the trade-policy puzzle, and suggests that social concerns as well as self-interest influence opinion formation about trade policy.

In addition to contributing to the trade policy literature, our paper provides a new methodology for investigating the role of envy and altruism in determining policy preferences. This general strategy could be applied to many other areas of economic policymaking for which envy and altruism may be influential in opinion formation. Our findings for trade policy recommend greater attention to how social concerns may influence the policymaking process across many areas of government economic policymaking.

References

[1] Baker, Andy. 2005. “Who Wants to Globalize? Consumer Tastes and Labor Markets in a Theory of Trade Policy Beliefs.” *American Journal of Political Science* Vol. 49 No. 4:924-38.

[2] Baldwin, Richard E., and Frederic Robert-Nicoud. 2007. "Entry and Asymmetric Lobbying: Why Governmments Pick Losers." London School of Economics Working Paper.

[3] Baldwin, Robert E. 1986. *The Political Economy of US Import Policy.* Cambridge: MIT Press.

[4] Ball, David. 1967. "United States Effective Tariffs and Labor's Share." *Journal of Political Economy* 75:183-187.

[5] Broda, Christian, and David Weinstein. 2006. "Globalization and the Gains from Variety." *Quarterly Journal of Economics* 121 (2):541-585.

[6] Broda, Christian, Nuno Limao, and David Weinstein. 2008. "Optimal Tariffs and Market Power: The Evidence." *American Economic Review* 98 (5):2032-65.

[7] Charness, Gary, and Matthew Rabin. 2002. “Understanding Social Preferences with Simple Tests.” *Quarterly Journal of Economics* Vol. 117 No. 3: 817-69.

[8] Constantopoulos, Maria. 1974. "Labour Protection in Western Europe." *European Economic Review* 5:313-328.

[9] Corden, Max. 1974. *Trade Policy and Economic Welfare.* Oxford: Oxford University Press.

[10] Curie, Janet, and Ann Harrison. 1997. “Sharing the Costs: The Impact of Trade Reform on Capital and Labor in Morocco.” *Journal of Labor Economics* Vol. 15 No. 3:S44-S71.

[11] Davidson, Carl, Steve Matusz, and Doug Nelson. 2006. "Fairness and the Political Economy of Trade." *The World Economy* pp. 989-1004.

[12] DellaVigna, Stefano. 2009. “Psychology and Economics: Evidence from the Field.” *Journal of Economic Literature* Vol. XLVII No. 2:315-372.

[13] Dunning, Thad. 2008. “Model Specification in Instrumental-Variables Regression." *Political Analysis* Vol. 16:290-302.

[14] Fehr, Ernst, and Klaus M. Schmidt. 1999. "A Theory of Fairness, Competition, and Cooperation." *The Quarterly Journal of Economics* 114:817-868.

[15] Fehr, Ernst, and Klaus M. Schmidt. 2006. "The Economics of Fairness, Reciprocity, and Altruism—Experimental Evidence and New Theories." In S. Kolm and Jean Mercier Ythier (eds.), *Handbook on the Economics of Giving, Reciprocity, and Altruism,* Elsevier, pp. 615-691.

[16] Freund, Caroline, and Caglar Ozden. 2008. "Trade Policy and Loss Aversion." *American Economic Review* 98:4, 1675-1691.

[17] Gawande, Kishore, and Pravin Krishna. 2003. "Political Economy of U.S. Trade Policy: Empirical Approaches." In James Harrigan and E. Kwan Choi (eds.), *Handbook of International Economics.* Basil: Blackwell, pp. 213-250.

[18] General Administration of Quality Supervision, Inspection and Quarantine of the People's Republic of China. 2002. *The People's Republic of China Standards: Industrial Classification for National Economic Activities*. Beijing: Standard Press of China.

[19] Gilligan, Michael. 1997. *Empowering Exporters: Delegation, Reciprocity, and Collective Action in Twentieth Century American Trade Policy.* Ann Arbor: University of Michigan Press.

[20] Goldberg, Pinelopi, and Giovanni Maggi. 1999. "Protection for Sale: An Emperical Investigation." *American Economic Review* 89:1135-1155.

[21] Goldberg, Pinelopi, and Nina Pavcnik. 2005. “Trade, wages, and the political economy of trade protection: evidence from the Columbian trade reforms.” *Journal of International Economics* 66:75-105.

[22] Goldberg, Pinelopi, and Nina Pavcnik. 2007. “Distributional Effects of Globalization in Developing Countries.” *Journal of Economic Literature* Vol. XLV (March):39-82.

[23] Grossman, Gene, and Elhanan helpman. 1994. "Protection for Sale." *American Economic Review* 84:833-850.

[24] Grossman, Gene, and Elhanan helpman. 1996. "Rent Dissipation, Free Riding, and Trade Policy." *European Economic Review* 40:795-803.

[25] Hainmueller, Jens, and Michael Hiscox. 2006. “Learning to Love Globalization: Education and Individual Attitudes Toward International Trade.” *International Organization* Vol. 60 No. 2:469-98.

[26] Hanson, Gordon, and Ann Harrison. 1999. “Trade Liberalization and Wage Inequality in Mexico.” *Industrial and Labor Relations Review,* Vol. 52 No. 2:271-288.

[27] Hays, Jude, Sean Ehrlich, and Clint Peinhardt. 2005. “Government Spending and Public Support for Trade in the OECD: An Empirical Test of the Embedded Liberalism Thesis.” *International Organization* Vol. 59 No. 2:473-494.

[28] Hillman, Arye. 1982. "Declining Industries and Political Support Protectionist Motives." *American Economic Review* 72:1180-87.

[29] Hiscox, Michael J. 1999. "The Magic Bullet? The RTAA, Institutional Reform, and Trade Liberalization." *International Organization* 53:669-698.

[30] King, Gary, Michael Tomz, and Jason Wittenberg. 2000. "Making the Most of Statistical Analyses: Improving Interpretation and Presentation." *American Journal of Political Science* Vol. 44 No. 2 (April):347-361.

[31] Krueger, Anne. 1990. "Asymmetries in Policy Between Exportables and Import-Competing Goods." In Ronald Jones and Anne Krueger (eds.),*The Political Economy of International Trade,* Cambridge, MA: Basil Blackwell.

[32] Limao, Nuno, and Arvind Panagariya. 2007. "Inequality and endogenous trade policy outcomes." *Journal of International Economics* 72:292-309.

[33] Levitt, Steven D., and John A. List. 2007. "What Do Laboratory Experiments Measuring Social Preferences Reveal About the Real World?" *Journal of Economic Perspectives* Vol. 21 No. 2:153-174.

[34] Mayda, Anna Marie, and Dani Rodrik. 2005. "Why Are Some People (and Countries) More Protectionist than Others?" *European Economic Review* Vol. 49 No. 6:1393-1430.

[35] Milner, Helen. 1987. "Resisting the Protectionist Temptation: Industry and the Making of Trade Policy in France and the United States during the 1970s." *International Organization* 41:639-65.

[36] Milner, Helen, and Bumba Mukherjee. 2009. "Democracy and the Skill-Bias in Trade Policy in Developing Countries." Princeton University Working Paper.

[37] National Bureau of Statistics of China. 2008. *China Statistical Yearbook.* Beijing: China Statistics Press.

[38] Olson, Mancur. 1965. *The Logic of Collective Action.* Cambridge, MA: Harvard University Press.

[39] O'Rourke, Kevin, and Richard Sinnott. 2001. "The Determinants of Individual Trade-Policy Preferences: International Survey Evidence." In S.M. Collins and D. Rodrik (eds.) *Brookings Trade Forum: 2001.* Washington D.C.: Brookings Institution Press.

[40] Peltzman, Sam. 1976. "Toward A More General Theory of Regulation." *Journal of Law and Economics* 19: 211-248.

[41] Rotemberberg, Julio. 2003. “Commercial Policy with Altruistic Voters.” *Journal of Political Economy* Vol.111 No. 1:174-201.

[42] Scheve, Kenneth, and Matthew J. Slaughter. 2001a. “What Determines Individual Trade-Policy Preferences.” *Journal of International Economics* Vol. 54 No. 2:267-92.

[43] Scheve, Kenneth, and Matthew J. Slaughter. 2001b. *Globalization and the Perceptions of American Workers.* Washington DC: Institute for International Economics.

[44] Sobel, Joel. 2005. “Interdependent Preferences and Reciprocity.” *Journal of Economic Literature* Vol. XLIII No. 2 (June):392-436.

[45] Stigler, George J. 1971. "The Theory of Economic Regulation." *Bell Journal of Economics and Management Science, pp.*137-146.

[46] Tovar, Patricia. 2009. “The effects of loss aversion on trade policy: Theory and evidence.” *Journal of International Economics* Vol. 78:154-167.