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Redistributive Politics with Target-specific Beliefs

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Abstract

It is widely accepted that beliefs about causes of income play an important role in redistributive politics. These beliefs are often conceptualized as priors about economy-wide parameters, such that a perceived cause of income applies to all income levels. However, we find that roughly 40% of Americans hold different beliefs about causes of high and low incomes. We refer to these beliefs as *target-specific* beliefs. This suggests a major gap in the literature: assuming that target-specific beliefs related to one group apply automatically to another group may generate comparative statics predictions related to various social changes that get even the sign wrong. This paper is a first step toward addressing this gap. We present a model with three income classes that allows causes of income to differ. Income depends on ability, effort and luck, and beliefs about mobility between the middle class and a low-income class may differ from beliefs about mobility between the middle class and a high-income class. We then analyze the effects of target-specific beliefs and major social changes, including skill-biased technological change and the shrinking middle class, on redistributive politics. Finally, using unique social survey and experimental data, we find that target-specific beliefs play an important role in redistributive preferences and behavior in a laboratory experiment.

D63; D72; H21; H24

Keywords: Redistribution, mobility, fairness, taxation, political economy

1. Introduction

It is widely accepted that beliefs about the roles of luck and effort in income generation play an important role in redistributive politics.[1] Individuals will be more opposed to redistribution if they believe that pre-tax, pre-transfer incomes are caused by factors under volitional control (e.g. effort) rather than circumstances beyond individual control (e.g. luck). These beliefs are often conceptualized as priors about economy-wide parameters, such that beliefs about causes of income apply to all levels of income. We refer to such beliefs as *general beliefs.*

Yet, using unique data from a Gallup Social Audit (Gallup 1998) we find, first, that roughly 42% of U.S. respondents give different answers when asked, respectively, about the reasons for being rich and the reasons for being poor. Table 1 presents cross-tabulations of two nearly identically worded questions about the reasons for people being rich and the reasons for people being poor.[2] The diagonal shows the numbers of observations, and row and column percentages, of respondents who gave the same response to each question. For a given response to one question, the percentage of respondents who gave the same response to the other question ranges from roughly 48% to 70%. We refer to different beliefs for different income groups as *target-specific beliefs*. The difference between the two answers is not driven by the intermediate category allowing respondents to state that both effort and luck matter. A striking 30% of respondents state either that being rich reflects strong effort while being poor is due to bad luck, or that being rich is a result of good luck and being poor is caused by lack of effort.

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[1] See, for instance, Alesina and Angeletos (2005), Alesina et al., (2001), Benabou and Tirole (2006), Besley and Coate (1992), Bowles and Gintis (2000), Corneo and Gruner (2002). Fong (2001), Fong et al. (2006), Miller (1992), Moffitt et al. (1998), Piketty (1995), Williamson (1974). Most researchers believe that these beliefs matter because of fairness concerns, particularly the principle of justice known as equity and certain types of reciprocity. According to the equity principle, individuals should receive resources from a group, organization, or society that are proportional to their contributions to it. See Miller (1992) and Walster, Walster and Berscheid (1978) on equity theory and Weiner (1996) on attribution theory. There are many different definitions of reciprocity. Two that are pertinent here are intentions based reciprocity (Rabin 1993) and strong reciprocity (Gintis et al 2005). These concerns may motivate individuals to support poor people who intended to work hard and "make it" on their own but failed despite hard effort and to punish or withhold support from those who intended to avoid work at the expense of taxpayer generosity. Also, the optimal tax literature asks what type of redistribution society should pursue, taking typically either utilitarian or Rawlsian social welfare function as the normative starting point.

[2] The wording of these questions is: (i) "Just your opinion, which is more often to blame if a person is poor –lack of effort on his or her part, or circumstances beyond his or her control?", and (ii) "Just your opinion, which is more often to blame if a person is rich –strong effort to succeed on his or her part, or luck or circumstances beyond his or her control?"

Second, we combine beliefs about the causes of income and redistributive preferences to show that target-specific beliefs are not merely noise, and they are not merely cheap talk. Regarding the former concern, we use the Gallup (1998) data to show that beliefs about causes of being poor have a substantially and significantly larger association with stated preferences for transfers to the poor than with stated preferences for taxing the rich. Similarly, beliefs about causes of being rich have a substantially and significantly larger association with stated preferences for taxing the rich than with stated preferences for transfers to the poor.[3] Regarding the latter concern, we present new results from a prior laboratory dictator game on giving of real money to real-world welfare recipients (Fong 2007), to show that target-specific beliefs about the causes of the recipients' poverty have strong effect on giving while general beliefs about causes of income have no significant effect.

This suggests a gap in the literature: When beliefs about a specific income class do not apply to other income classes, models which assume general beliefs may generate misleading results. As we will show, assuming general beliefs can even produce the wrong sign for some comparative statics related to major social changes if the underlying process involves target-specific beliefs. Thus, without theory and data on target-specific beliefs, we cannot understand the political-economic implications of real or perceived economic experiences for a specific income class.

This paper is a first step toward addressing this gap. We present a model with three income classes: low, middle and high. Income depends on ability, effort and luck, and beliefs about mobility between the middle class and a low-income class may differ from beliefs about mobility between the middle class and a high-income class. We then analyze the effects of target-specific beliefs and major social changes, including skill-biased technological change and the shrinking middle class,

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[3] The question wording is: (i) "Some people feel that the government in Washington, DC should make every possible effort to improve the social and economic position of the poor. Others feel that the government should not make any special effort to help the poor, because they should help themselves. How do you feel about this? 1) The government should help the poor 2) The poor should help themselves." (ii) "People feel differently about how far a government should go. Here is a phrase which some people believe in and some don't. Do you think our government should or should not redistribute wealth by heavy taxes on the rich? 1) should 2) should not."

on redistributive politics. Finally, we present analysis of unique social survey and prior experimental data showing that target-specific beliefs play an important role in redistributive preferences and behavior.

Our analysis represents a significant departure from the prior literature in that it stresses a need to move beyond unidimensional models of redistributive politics, and takes a first step toward modelling how redistributive preferences across the income distribution depend on target-specific beliefs about income-generating process. The prior literature has focused on the relationship between general beliefs and a single-dimensional redistributive policy – typically represented by a proportional tax with a lump-sum transfer (Alesina and Angeletos, 2005; Benabou and Tirole, 2006; Piketty, 1995).[4] Target-specific beliefs cannot matter in this setting and yet, they are empirically consequential and hold promise for illuminating political consequences of important social changes. Our model introduces an extra dimension but still captures a complete income generating process. We analyze the case in which beliefs are consistent in the sense that beliefs about the type distribution and income-generating process would generate the observable income distribution. We show that a certain belief about the type distribution and the income generating process that determines whether people in a certain group end up in the low-income class or the middle-income class gives predictions about the income generating process allocating other people between the middle-income class and the high-income class. Importantly, each of these income generating processes may include a random component and these random components may differ in their strength. An alternative approach might be to allow completely independent income generating processes and beliefs for different social categories. For instance, one might argue that a model of general beliefs might be apply independently for, say, white people versus black people, or for welfare recipients versus full-time employees. While this may also be empirically plausible, this ad hoc approach does not offer a priori predictions.

Finally, our paper points to a need for further data and research on target-specific beliefs. Aside from the data presented in this paper, there is extremely little, if any, good data on target-specific beliefs, and no repeated cross-section data.

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[4] This literature builds upon and extends the framework of earlier papers on optimal redistribution, especially Meltzer and Richard (1981).

The rest of this paper is organized as follows. Section 2 presents the model. Section 3 presents the main empirical analysis using Gallup data. Sections 4 present supplementary evidence from a prior dictator game on giving to the poor. Section 5 concludes.

2. The model

2.1 Stochastic income process

We assume that agents differ in their ability, effort and income, and both luck and effort may play a role in the determination of income. The effects of ability are modelled through investment in effort. This subsection focuses on income realizations with given effort choices; individually optimal effort choices are analyzed in subsection 2.2. To capture the presence of different income classes and to allow effort vary in the determination of high and low incomes, we assume that there are three different effort levels, e_l corresponding to the low effort, e_i corresponding to the intermediate effort and e_h corresponding to the high effort, and three gross income levels, y_l corresponding to the low income for the poor, y_i corresponding to the intermediate income for the middle class and y_h corresponding to the high income for the rich. [5]

Those who choose low effort e_l have low income y_l with certainty, and can be depicted as lazy poor. Those who choose intermediate effort, obtain intermediate income y_i with probability p, and low income with probability 1-p. If they are unlucky and obtain low income, they can be interpreted as industrious poor who did not succeed, despite their best effort. Those who choose high effort obtain high income y_h with probability q and intermediate income with probability 1-q. If obtaining high income they can be viewed as industrious rich. Furthermore, there is a fraction r of population which has high incomes thanks to external circumstances, like bequests or family connections. We refer to this class in the following as entitled rich. Our setting implies that low income can result either from lack of effort or from bad luck, and high income can result

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[5] The assumption of three effort and income levels is made to be in line with separating those with high incomes and those with low incomes in our empirical analysis, while allowing there to be a middle class in between. At the cost of notational complexity, the number of effort and income levels could be extended.

from high effort or good luck. The mass of agents with low incomes is m_l, the mass of agents with intermediate incomes is m_i and the mass of agents with high incomes is m_h, with $m_l + m_i + m_h = 1$. While the mass of agents with each income level is common knowledge, the values of the parameters p, q and r are not. The parameters of the stochastic income process are not observable, and people may have different beliefs about those. We denote the probabilities and the population share of the entitled rich as perceived by individual j by p^j, q^j, and r^j.

Our model is rich enough to allow for different perspectives on the role of effort and luck in determining low incomes and high incomes, subject to the constraint that beliefs must be consistent with the realized income distribution in the society. In other words, different agents may have different beliefs about the role of effort and the distribution of agents in the society according to how these invest in effort, as well as the size of the class of entitled rich, but such beliefs must result in a distribution of earnings that corresponds with the real distribution. Denote the mass of agents whom individual j expects to choose effort k, $k \in \{l, i, h\}$, by n_k^j. Beliefs about the stochastic income process and the type distribution must satisfy the condition that the expected shares of different income types correspond to the real shares:

$$m_l = n_l^j + n_i^j(1 - p^j)$$
$$m_i = n_i^j p^j + n_h^j(1 - q^j)$$
$$m_h = n_h^j q^j + r^j.$$

There is a continuum of different combinations of the mass of underlying types that differ in their investment in effort and in terms of the stochastic income process. We first take as our starting point the real sizes of different income groups and the beliefs (p^j, q^j, r^j) that the agent j has on the stochastic income process (alternatively, we could fix the number of agents whom j believes to have made certain effort choices and endogenize probabilities). We can solve:

$$n_h^j = \frac{m_h - r^j}{q^j}$$

$$n_i^j = \frac{m_i - \frac{(m_h - r^j)(1 - q^j)}{q^j}}{p^j}$$

$$n_l^j = m_l - \frac{m_i - \frac{(m_h - r^j)(1 - q^j)}{q^j}}{p^j}(1 - p^j).$$

These expressions allow us to define the beliefs of the determinants of low incomes and of high incomes by individual j. Individual j perceives the share of those with high incomes having high incomes thanks to being entitled rich, rather than effort, being $\frac{r^j}{m_h}$ and the share of those who successfully invested in effort and then succeeded as $\frac{m_h - r^j}{m_h}$. The latter can be viewed as industrious rich whose fortune is self-made. It is easy to see that the share of high incomes due to entitlement rather than effort is increasing in r^j; here it is interpreted that the success of all those who invest and succeed is attributed to the effort (or effort and luck). Individual j perceives the share of low incomes being the result of not investing in effort, rather than being unlucky in one's investment, as

(1) $\qquad \frac{n_l^j}{m_l} = 1 - \frac{m_i - \frac{(m_h - r^j)(1 - q^j)}{q^j}}{p^j m_l}(1 - p^j).$

Our model generates the following prediction:

Proposition 1. (i) $\forall p^j, q^j: \frac{\partial(n_l^j/m_j)}{\partial r^j} < 0$; (ii) $\forall p^j, r^j: \frac{\partial(n_l^j/m_j)}{\partial q^j} < 0$; (iii)) $\forall q^j, r^j: \frac{\partial(n_l^j/m_j)}{\partial p^j} > 0$

Proof. *Follows by differentiating (1).*

Proposition 1 highlights the importance of accounting for target-specific beliefs. Part (i) shows that with given beliefs about the probability of success with intermediate effort and high effort, the share of low incomes attributed to the lack of effort is decreasing in r^j, the share of the entitled rich. Therefore, a belief that the rich are less deserving of their high incomes implies a belief that a larger share of the poor are industrious, meaning that beliefs about the share of deserving, hard-working rich and deserving, industrious poor move in opposite directions when beliefs about the share of entitled rich change. Part (ii) states that with a given belief about the probability of success with intermediate investment and given belief about the mass of entitled rich, a perception that the probability of success with high effort increases implies a belief that larger share of the poor are industrious. In this case, beliefs about the share of deserving, hard-

working rich and deserving, industrious poor move in the same direction. If one would assume general beliefs about the role of effort, such a pattern would be impossible. Part (iii) implies that if the perceived probability of success of intermediate effort investment increases, then a larger share of the poor is viewed to be lazy, ceteris paribus.

Proposition 1 illustrates how a given change in beliefs about the income-generating process can imply either parallel or opposite changes in beliefs about the share of industrious rich and industrious poor. Such a stark result highlights the importance of collecting target-specific beliefs in order to understand demands for redistribution, targeting those with low incomes and those with high incomes. Our model can also be used to derive predictions related to major social changes, like globalization, skill-biased technological change or shrinking middle class.

Globalization and skill-biased technological change
Three major patterns in the American income distribution in past decades have been a stagnating middle class, a steady increase in the income share of the top income earners, and stagnating or even declining incomes of the working class, especially in the Rust Belt with traditional industries. In a series of papers with various coauthors, Acemoglu and Autor have highlighted the role that technological change and globalization, especially the entry of China into global values chains, have played in this. Given that the change has been so rapid and that formal education as well as on-the-job training and work experience in early years of career have a major influence on lifetime earnings, it is a reasonable to view investment in low, intermediate or high effort to a large extent sunk for most people during the recent period of rapid economic changes.

In the United States, the main effect of globalization in terms of beliefs about the determinants of success has been to reduce p. We can take the realized changes in income classes as the starting point, so that stagnating or declining incomes at the lower part of income distribution correspond to an increase in the size of low-income population, and a shrinking middle class. This can be modelled as a reduction is m_i and an increase in m_l, driven by p^j adjusting downwards. As a result, globalization and skill-biased technological change should imply that a larger share of the poor are deserving poor who have invested in effort, but suffered bad luck, due to global

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competition and technological change. In addition to reducing p, globalization and skill-biased technological change can be expected to reduce y_l and possibly also y_i.

It is less clear how globalization and skill-biased technological change should be interpreted to influence q. It appears plausible that globalization and skill-biased technological change increase y_h, but it is an open question how such benefits should be expected to be divided. One possible scenario, resulting in increased income inequality, is that globalization and skill-biased technological change would increase y_h, but also decrease p, q, y_l and y_i. The result would be increasing inequality, as well as perception that a larger share of the poor are industrious and possibly also that a larger share of the rich are entitled rich, in case globalization would leave r unchanged, but reduce q. This type of scenario could explain the anger towards the Wall Street, and "the one percent" of global elite who are perceived to pocket the gains while the middle class declines and even those who invest in university education suffer for increased uncertainty related to their future earnings (which in our model corresponds to a decline in q).

2.2 Redistribution and subsequent investment in effort

The government can levy non-linear taxes and transfers. We denote the net tax on those with high income by t_h, on those with intermediate income by t_i and on those with low incomes by t_l. Note that the sign of these is not restricted; in a tax system that redistributes incomes from those with high incomes to those with low incomes, it is reasonable to expect that $t_h > 0$ and $t_l < 0$. The sign of t_i is open, but it can be expected to be positive in most countries, implying that also the middle class is net payer. We assume that taxes are set before individuals decide on their investment in effort, in line with Meltzer and Richard (1981). This implies that citizens take into account how taxes may distort effort choices when voting on taxes. An alternative approach, in which part of effort investment is done already before taxes are set, as in Alesina and Angeletos (2005), would result in multiple equilibria, depending on expectations concerning income redistribution. As our focus is on understanding the role that beliefs about the determinants of success play in determining preferred tax policies, we adopt the simpler set-up to deliver testable predictions that are not conditional on which of the multiple equilibria the economy might end up with.

Denoting government's exogenous revenue requirement for other purposes than income redistribution by g, the government budget constraint reads as

(2) $\qquad m_l t_l + m_i t_i + m_h t_h = g.$

Ability differences affect the cost of investment in effort, so that the higher the ability the lower the effort cost. We normalize the cost of low effort investment to zero for everyone. Agent j has effort cost c_j of investment in intermediate effort, and cost $x c_j$ of investment in high effort, so that $x > 1$ is the same for all agents. Effort cost follows a continuous distribution, so that $c \in [\underline{c}, \overline{c}]$ and $0 < \underline{c} < \overline{c}$. After tax rates have been set, risk-neutral agents decide investment in effort to maximize their expected utility. Agent j's utility if choosing low effort is given by

$$u_l^j = y_l - t_l.$$

Agent j's expected utility if choosing intermediate investment in effort is

$$Eu_i^j = (1 - p^j)(y_l - t_l) + p^j(y_i - t_i) - c_j.$$

Agent j's expected utility if choosing high investment in effort is

$$Eu_h^j = (1 - q^j)(y_i - t_i) + q^j(y_h - t_h) - x c_j.$$

Finally, if agent j is of entitled rich type,

$$u_r^j = y_h - t_h.$$

Agent j invests in low effort if $u_l^j \geq Eu_i^j$, implying

$$y_l - t_l \geq (1 - p^j)(y_l - t_l) + p^j(y_i - t_i) - c_j.$$

Agent j invests in high effort rather than in intermediate effort if $Eu_h^j > Eu_i^j$, implying

$$(1 - q^j)(y_i - t_i) + q^j(y_h - t_h) - x c_j > (1 - p^j)(y_l - t_l) + p^j(y_i - t_i) - c_j.$$

If neither of these conditions is satisfied, j invests in intermediate effort. After rearranging, the condition of investing in low effort can be written as

(3) $\qquad c_j \geq p^j(y_i - t_i - y_l + t_l).$

Here, $(y_i - t_i - y_l + t_l)$ gives the increase in net income in case of reaching an intermediate income level. An agent invests in effort if this potential increase, multiplied by the probability of success, exceeds the cost of investment. The condition for investment in high effort can be rewritten as

(4) $\qquad c_j < \dfrac{(1-p^j)(y_i - t_i - y_l + t_l) + q^j(y_h - t_h - y_i + t_i)}{x - 1}.$

The nominator gives the increase in the expected net income from high effort investment, relative to the intermediate effort investment. High effort is optimal if this is larger than the additional cost of high effort, relative to intermediate effort, $(x-1)c_j$. Our expressions show that the likelihood that an individual invests in intermediate effort, relative to low effort, increases in the difference in the net incomes associated with the two choices. This implies that more generous transfers to those with low incomes, or higher taxes on those with intermediate incomes, depress investment in intermediate effort. Correspondingly, investment in high effort depends on net income differences both between those with intermediate and those with low gross incomes, and between those with high and those with intermediate gross incomes. Income equalization on either margin reduces investment in effort.

Given that private effort investment depends on both objective income wedges and on subjective beliefs concerning the probability of success, there is no guarantee that effort choices would increase monotonically in ability. That would be the case if everyone had equal beliefs, or if subjective probabilities of successful investment increased in ability. To define agent j's expectations on how other agents in the economy invest in effort, denote j's expectation of an arbitrary agent k's subjective probability of success in case of intermediate effort by p^{kj} and in case of high effort by q^{kj}, and j's expectation of k's cost by c_k^j. Indicator variable $I^{kj}(c_k^j \geq p^{kj}(y_i - t_i - y_l + t_l))$ obtains a value of one if $c_k^j \geq p^{kj}(y_i - t_i - y_l + t_l)$ and zero otherwise. Similarly, indicator variable $I^{kj}(c_k^j < \frac{(1-p^{kj})(y_i-t_i-y_l+t_l)+q^{kj}(y_h-t_h-y_i+t_i)}{x-1})$ obtains a value of one if $c_k^j < \frac{(1-p^{kj})(y_i-t_i-y_l+t_l)+q^{kj}(y_h-t_h-y_i+t_i)}{x-1}$ and zero otherwise. Integrating over expectations concerning whole population (k goes from zero to one), we obtain

$$n_l^j = \int_{k=0}^1 I^{kj}(c_k^j \geq p^{kj}(y_i - t_i - y_l + t_l))dk$$

$$n_h^j = \int_{k=0}^1 I^{kj}\left(c_k^j < \frac{(1-p^{kj})(y_i - t_i - y_l + t_l) + q^{kj}(y_h - t_h - y_i + t_i)}{x - 1}\right)dk.$$

When it comes to changes in taxes and transfers, we assume that a change in the net tax on those with low incomes t_l is associated with equal changes in taxes on those with intermediate incomes t_i and in taxes on those with high incomes t_h, so that changes in redistribution towards those with low incomes do not change the tax wedge between those with intermediate incomes

and those with high incomes, and their effects are equally shared by the taxpayers with higher incomes. A change in taxes on those with high incomes is balanced by an opposite change in taxes on those with intermediate incomes, to decouple marginal changes in taxes on those with high incomes from redistribution towards those with low incomes. Therefore, (2) gives:

(5)
$$\frac{dt_i}{dt_l} = \frac{dt_h}{dt_l} = \frac{-m_l}{m_i + m_h} < 0$$

(6)
$$\frac{dt_i}{dt_h} = -\frac{m_h}{m_i} < 0.$$

We denote the rates at which individual j expects changes in t_l and t_h to affect changes in the size of the different groups by $\frac{dn_l^j}{dt_l}$, $\frac{dn_l^j}{dt_h}$, $\frac{dn_h^j}{dt_l}$, and $\frac{dn_h^j}{dt_h}$. As an increase in t_l and a decrease in t_i makes investment in intermediate effort unambiguously more attractive than investment in low effort, we have

(7)
$$\frac{dn_l^j}{dt_l}\bigg|_{dt_i = dt_h = \frac{-m_l dt_l}{m_i + m_h}} < 0.$$

We also have

(8)
$$\frac{dn_h^j}{dt_l}\bigg|_{dt_i = dt_h = \frac{-m_l dt_l}{m_i + m_h}} > 0$$

as an increase in t_l and equal decreases in t_i and t_h make investment in high effort at the margin between high effort and intermediate effort more attractive than an investment in intermediate effort (due to the risk of low income associated with intermediate effort investment).

A priori, it is unclear how the size of the group of those investing in intermediate effort changes. If the increase in the group around the cutoff between low effort and intermediate effort is larger than the decrease around the cutoff between intermediate effort and high effort – which is plausible if effort costs are skewed so that the densities at higher costs (corresponding to low to intermediate abilities) are higher than densities at relatively low costs (corresponding to intermediate to high abilities) then the size of the intermediate group increases with an increase in t_l.

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An increase in t_h, combined with a budget-balancing decrease in t_i, unambiguously decreases investment in high effort as it reduces the expected income with high effort investment and increases the expected income with intermediate effort investment:

(9)
$$\left.\frac{dn_h^j}{dt_h}\right|_{dt_i=-\frac{m_h dt_h}{m_i}} < 0.$$

The share of those choosing low effort investment is also reduced when the expected income with intermediate effort investment increases, implying that the share of population choosing intermediate effort investment increases from both above and below:

(10)
$$\left.\frac{dn_l^j}{dt_h}\right|_{dt_i=-\frac{m_h dt_h}{m_i}} < 0$$

(11)
$$\left.\frac{dn_i^j}{dt_h}\right|_{dt_i=-\frac{m_h dt_h}{m_i}} > 0.$$

2.3. Fairness considerations

Individuals care about both own income and fairness. We follow Alesina and Angeletos (2005) and assume that individual j has utility

(12)
$$U_x^j = Eu_x^j - \gamma^j \Omega^j.$$

In this equation, u_x^j refers to individual j's private expected utility from consumption, net of eventual effort costs, with individual j's effort choice or status as having exogenous high income as entitled rich being denoted by x, $x\epsilon\{l, i, h, r\}$, with $Eu_l^j = u_l^j$ and $Eu_r^j = u_r^j$. Term Ω^j represents disutility generated by unfair social outcomes, and is otherwise as in Alesina and Angeletos (2005), with the difference that we model it as individual-specific variable depending on individual beliefs about the stochastic income process while Alesina and Angeletos model it as a term identical to everyone in the society. However, we follow Alesina and Angeletos (2005) in defining fairness as a common conviction that one should get what one deserves, and deserve what one gets. We define belief in what one deserves based on one's investment in effort: those with low investment deserve low income, those with intermediate investment deserve intermediate income and those with high investment deserve high income. Denoting individual

j's perception of agent k's realized utility by u^{kj} and of agent k's "fair" level of utility by $\hat{u}^{kj}$, the modified measure of social injustice in line with Alesina and Angeletos (2005) is given by

$$\Omega^j = \int_{k=0}^{1} (u^{kj} - \hat{u}^{kj})^2 dk.$$

Using the individual beliefs, this can be simplified as

$$\Omega^j = \left(1 - n_l^j - n_h^j\right)\left(1 - p^j\right)(y_i - t_i - y_l + t_l)^2 + n_h^j\left(1 - q^j\right)(y_h - t_h - y_i + t_i)^2$$
$$+ r^j(y_h - t_h - y_l + t_l)^2.$$

Differentiating Ω^j with respect to t_l, subject to (5), yields

$$\frac{d\Omega^j}{dt_l}\bigg|_{dt_i=dt_h=\frac{-m_l dt_l}{m_i+m_h}}$$

$$= 2\left(1 - n_l^j - n_h^j\right)\left(1 - p^j\right)(y_i - t_i - y_l + t_l)\left(1 + \frac{m_l}{m_i + m_h}\right)$$

$$+ 2r^j(y_h - t_h - y_l + t_l)\left(1 + \frac{m_l}{m_i + m_h}\right)$$

$$+ \left(1 - p^j\right)(y_i - t_i - y_l + t_l)^2 \frac{dn_i^j}{dt_l}\bigg|_{dt_i=dt_h=\frac{-m_l dt_l}{m_i+m_h}}$$

$$+ \left(1 - q^j\right)(y_h - t_h - y_i + t_i)^2 \frac{dn_h^j}{dt_l}\bigg|_{dt_i=dt_h=\frac{-m_l dt_l}{m_i+m_h}}.$$

The first term on the right-hand side captures the welfare cost of increasing t_l on perceived social injustice as this increases the earnings gap between what those who invested in intermediate effort deserve and what they receive, without taking into account changes in effort choices. The second term captures the welfare cost of increasing t_l on perceived social injustice as this increases the gap between what those with high incomes due to luck receive $(y_h - t_h)$, and what they deserve, due to their lack of effort $(y_l - t_l)$, without taking into account changes in effort choices. The last two terms refer to changes in effort choices. As long as an equal reduction in t_i and in t_h and an increase in t_l is associated in an increase in the number of those who choose intermediate effort, the third term is positive. This is the case if the density around the cutoff between low effort and intermediate effort is at least as high as the density around the cutoff between intermediate effort and high effort. The fourth term is positive as an increase in t_l

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and an equal reduction in t_i and in t_h makes high effort more attractive relative to intermediate effort for those at the margin between the two.

If the number of those choosing intermediate investment in effort is reduced (which may happen if the density at the upper part of ability distribution, measured by the cutoff between intermediate and high effort, is higher than the density at the lower to intermediate part of the ability distribution, measured by the cutoff between low and intermediate investment in effort) the sum of the third and the fourth term is positive if and only if

$$-(1 - p^j)(y_i - t_i - y_l + t_l)^2 \frac{dn_l^j}{dt_l}\Bigg|_{dt_i = dt_h = \frac{-m_l dt_l}{m_i + m_h}}$$

$$+ \left[(1 - q^j)(y_h - t_h - y_i + t_i)^2 - (1 - p^j)(y_i - t_i - y_l + t_l)^2 \right] \frac{dn_h^j}{dt_l}$$

The first term is positive as $\frac{dn_l^j}{dt_l} < 0$. The second term is positive at least if the risk of failure from high investment is larger than the risk of failure from intermediate investment, and the difference in disposable incomes between high incomes and intermediate incomes is larger than the difference in disposable incomes between intermediate incomes and low incomes.

To sum up: an increase in t_l increases Ω^j, perceived social injustice. In the plausible case in which $\frac{dn_i^j}{dt_l}\Big|_{dt_i = dt_h = \frac{-m_l dt_l}{m_i + m_h}} > 0$, this is driven by three mechanisms all pushing in the same direction. First, there is an increase in the income gap between fair and realized disposable income between those who invested in intermediate effort and succeeded and those who did not. Second, there is an increase in the income gap between fair and realized disposable income for the entitled rich who did not invest in effort but receive, nonetheless, high income. Third, there is increased investment in effort which means, when the success of investment in effort is stochastic, that the size of the group who were unlucky as concerns their return to investment goes up. In Alesina and Angeletos (2005) framework, low incomes arising from not investing in effort are fair more investment with stochastic returns increased perceived unfairness in incomes. If the third term would not be positive, then the sign of the overall effect depends on the relative size of the competing effects.

Differentiating Ω^j with respect to t_h, subject to (6), yields

$$\left.\frac{d\Omega^j}{dt_h}\right|_{dt_i=\frac{-m_h dt_h}{m_i}}$$

$$= 2(1 - n_l^j - n_h^j)(1 - p^j)(y_i - t_i - y_l + t_l)\frac{m_h}{m_i}$$

$$- 2n_h^j(1 - q^j)(y_h - t_h - y_i + t_i)\left(1 + \frac{m_h}{m_i}\right) - 2r^j(y_h - t_h - y_l + t_l)$$

$$+ (1 - p^j)(y_i - t_i - y_l + t_l)^2 \left.\frac{dn_i^j}{dt_h}\right|_{dt_i=-\frac{m_h dt_h}{m_i}}$$

$$+ (1 - q^j)(y_h - t_h - y_i + t_i)^2 \left.\frac{dn_h^j}{dt_h}\right|_{dt_i=-\frac{m_h dt_h}{m_i}}$$

The overall effect of increasing taxes on those with high incomes and reducing taxes on those with intermediate incomes on perceived social unfairness is unclear. The first term on the right-hand side is positive. It captures the welfare cost of decreasing t_i on perceived social injustice as this increases the earnings gap between what those who invested in intermediate effort deserve and what they receive, without taking into account changes in effort choices. The second term is negative, reducing perceived social unfairness. It captures the welfare gain of increasing t_h and decreasing t_i as this decreases the gap between what those whose investment in high effort failed to deliver high incomes deserve and what they receive. The third term measures the welfare gain from reducing the gap between what those with high incomes due to entitlement receive, and what they deserve, due to their lack of effort, without taking into account changes in effort choices. The last two terms refer to changes in effort choices. The fourth term is positive, implying increased social unfairness as more people choosing intermediate investment in effort means also more people failing in their investment (with constant failure rate). The fifth term is negative as higher t_h means that fewer people choose high effort investment, reducing also the number of those who fail in their investment.

2.4. Preferences towards redistribution

When taking into account both own income and social welfare, the preferred tax rates balance self-interest and social considerations. Let us first analyze someone choosing low investment in effort and not belonging to the group of those who obtain high incomes without an investment in effort. For such a person, the welfare effect of increasing t_l and decreasing t_i and t_h is given by

$$\left.\frac{dU_l^j}{dt_l}\right|_{dt_i=dt_h=\frac{-m_l dt_l}{m_i+m_h}} = -1 - \gamma^j \left.\frac{d\Omega^j}{dt_l}\right|_{dt_i=dt_h=\frac{-m_l dt_l}{m_i+m_h}}.$$

Both terms on the right-hand side are negative (apart from an extremely unlikely case in which individual j would perceive an increase in t_l to have a dramatic impact in reducing perceived unfairness), meaning that we should expect those investing in low effort to oppose increasing t_l.

The welfare effect of increasing t_l and decreasing t_i and t_h on someone who chooses intermediate investment in effort is given by

$$\left.\frac{dEU_i^j}{dt_l}\right|_{dt_i=dt_h=\frac{-m_l dt_l}{m_i+m_h}} = -\left(1-p^j\right) + p^j \frac{m_l}{m_i+m_h} - \gamma^j \left.\frac{d\Omega^j}{dt_l}\right|_{dt_i=dt_h=\frac{-m_l dt_l}{m_i+m_h}}.$$

The first two terms give the effect of the tax change on own expected income, and the last term on perceived social unfairness. The effect of the first two terms depends on whether individual j perceives himself or herself to be net payer or net recipient from the income redistribution in terms of expected payments. The last term is most likely pushing for lower t_l, with the same caveat as above.

The welfare effect of increasing t_l and decreasing t_i and t_h on someone who chooses high investment in effort is given by

$$\left.\frac{dEU_i^j}{dt_l}\right|_{dt_i=dt_h=\frac{-m_l dt_l}{m_i+m_h}} = \frac{m_l}{m_i+m_h} - \gamma^j \left.\frac{d\Omega^j}{dt_l}\right|_{dt_i=dt_h=\frac{-m_l dt_l}{m_i+m_h}}.$$

The first term gives the effect of the tax and transfer changes on own expected income, and is unambiguously positive. The second term is most likely pushing for lower t_l, with the same caveat as above. Therefore, individual j who chooses a high investment in effort can be expected

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to prefer t_l which balances private gains from less redistribution with social motivation to reduce perceived unfairness in realized distribution of disposable incomes.

Finally, the welfare effect of increasing t_l and decreasing t_i and t_h on someone who has high income for exogenous reasons of entitlement is given by

$$\left.\frac{dEU_r^j}{dt_l}\right|_{dt_i=dt_h=\frac{-m_l dt_l}{m_i+m_h}} = \frac{m_l}{m_i+m_h} - \gamma^j \left.\frac{d\Omega^j}{dt_l}\right|_{dt_i=dt_h=\frac{-m_l dt_l}{m_i+m_h}},$$

with similar interpretation as above. We can summarize our results as follows:

Proposition 2. With any given social preferences and beliefs about the type distribution and probabilities of success, those choosing low effort prefer smallest t_l, and those choosing high effort or having high income due to entitlement prefer the highest t_l, with those choosing an intermediate effort investment being in between.

Proof. *As Ω^j is convex in t_l, t_i and t_h, $-\gamma^j\Omega^j$ is concave. An interior solution would then mean that the preferred t_l is highest for those with low effort (and income), second lowest for those with intermediate effort (but still having a positive probability of ending up with low income) and highest for those choosing high effort or having high income for exogenous reasons.*

Next, let us analyze perceived effects of changes in taxes on those with high incomes and intermediate incomes. For someone choosing low investment in effort and not belonging to the group of those who obtain high incomes without an investment in effort, the welfare effect of increasing t_h and decreasing t_i is given by

$$\left.\frac{dU_l^j}{dt_h}\right|_{dt_i=-\frac{m_h dt_h}{m_i}} = -\gamma^j \left.\frac{d\Omega^j}{dt_h}\right|_{dt_i=-\frac{m_h dt_h}{m_i}}.$$

Given that we assume that the reallocation of the tax burden between those with high incomes and those with intermediate incomes does not affect the tax or transfer to those with low incomes, the group whose income is low with certainty cares about it only through its effect on perceived social unfairness.

The perceived effects of the tax change on those who choose intermediate effort investment is given by

$$\left.\frac{dEU_i^j}{dt_h}\right|_{dt_i=-\frac{m_h dt_h}{m_i}} = p^j \frac{m_h}{m_i} - \gamma^j \left.\frac{d\Omega^j}{dt_h}\right|_{dt_i=-\frac{m_h dt_h}{m_i}}.$$

The first term is positive, reflecting the fact that an increase in taxes on high incomes allows reducing taxes on those with intermediate incomes. The second term captures the effect on perceived social unfairness. Someone choosing intermediate investment in effort would prefer the level of taxation of high incomes that balances the private redistributive gains with social costs of any further increase in taxes on high incomes causing an increase in perceived social unfairness.

The perceived effects of the tax change on those who choose high effort investment is given by

$$\left.\frac{dEU_h^j}{dt_h}\right|_{dt_i=-\frac{m_h dt_h}{m_i}} = -q^j + (1 - q^j)\frac{m_h}{m_i} - \gamma^j \left.\frac{d\Omega^j}{dt_h}\right|_{dt_i=-\frac{m_h dt_h}{m_i}}.$$

The first term depicts the effect of higher taxes in case of good realization of high income, multiplied by the probability of good realization. The second term is the effect of higher taxes on intermediate incomes, in case of achieving only intermediate income, despite high investment. The third term captures the effect on perceived social unfairness. For someone choosing a high investment in effort the sum of the first two terms is negative, as long as $-q^j + \left(1 - q^j\right)\frac{m_h}{m_i} <$ 0. In that case, the person choosing high effort would prefer the level of taxation of high incomes that balances the private redistributive losses with social gains of any further increase in taxes on high incomes causing a decrease in perceived social unfairness. This means that those choosing high effort would be on the opposite position compared with those choosing intermediate effort, and balancing with their preferred level of taxation private gains with perceived social losses.

Finally, the welfare effect of increasing t_h and decreasing t_i on someone who has high income for exogenous reasons of good luck is given by

$$\left.\frac{dU_r^j}{dt_h}\right|_{dt_i=-\frac{m_h dt_h}{m_i}} = -1 - \gamma^j \left.\frac{d\Omega^j}{dt_h}\right|_{dt_i=-\frac{m_h dt_h}{m_i}}.$$

The first term depicts the private losses from higher taxes on high incomes. If the person prefers, nonetheless, some taxes on high incomes, then in equilibrium the private loss has to be balanced by social gains, captured by the second term.

We can now show:

Proposition 3. With any given social preferences and beliefs about the type distribution and probabilities of success, those who obtain high income without effort for exogenous reasons prefer the lowest t_h. The ordering of the preferred t_h for the other effort choices is

(i) If $p^j \frac{m_h}{m_i} > 0 > \left(1 - q^j\right)\frac{m_h}{m_i} - q^j$, then intermediate effort type prefers the highest t_h, the low effort type prefers the second highest t_h and the high effort type prefers the third highest t_h

(ii) If $p^j \frac{m_h}{m_i} > \left(1 - q^j\right)\frac{m_h}{m_i} - q^j > 0$, then intermediate effort type prefers the highest t_h, the high effort type prefers the second highest t_h and the low effort type prefers the third highest t_h

(iii) If $\left(1 - q^j - p^j\right)\frac{m_h}{m_i} - q^j > 0$, then high effort type prefers the highest t_h, the intermediate effort type prefers the second highest t_h and the low effort type prefers the third highest t_h.

Proof. *As Ω^j is convex in t_l, t_i and t_h, $-\gamma^j \Omega^j$ is concave. The preferred t_h is then increasing in the terms measuring the effect of the increase in t_h on the expected income.*

In case (i), the probability of success with high effort investment is sufficiently high so that those who invest in high effort lose from the expected redistribution from those with high incomes to those with intermediate incomes if the tax rate on high incomes is increased and that of

intermediate incomes reduced in a budget-balancing way. The preferred t_h is then not single-peaked in expected income: while the lucky rich prefer the highest tax rate and those who choose high effort the second highest, the third highest tax rate is not that preferred by those choosing the intermediate effort, but that chosen by those choosing low effort. Those choosing the intermediate effort prefer the highest tax rate as they are the group benefiting from budget-balancing cut in the tax rate on those with intermediate incomes.

In case (ii), the share of entitled rich is sufficiently high and the probability of success with high effort investment is sufficiently low so that even those choosing high effort investment benefit from increasing tax rates on those with high incomes, combined with a budget-balancing reduction in the tax rate on those with intermediate incomes although less than those choosing intermediate investment in effort. The preferred taxes on high incomes are single-peaked in expected income, with those choosing intermediate effort investment preferring highest taxes.

Note that the case (iii) of Proposition 2 can arise only if the probability of success is sufficiently low. For example, $p^j + q^j \geq 1$ is a sufficient condition to rule out case (iii). If the condition in (iii) prevails, those choosing high effort are more likely to end up with intermediate income than those choosing intermediate effort, and the group r^j is sufficiently big so that the types who invest in high effort gain in terms of expected income from increasing taxes on those with high incomes and transferring money to those with low incomes.

Proposition 2 implies that the preferences concerning reallocating tax burden between those with high incomes and those with intermediate incomes are more complicated than preferences concerning taxes and transfers on those with low incomes. Taking into account that beliefs concerning success may differ, the finding that the preferences in Proposition 2 are not single-peaked suggests that empirical relationship between income (or education) and preferred taxes on those with high incomes is likely to be weaker than the relationship between income (or education) and preferred transfers to those with low incomes. With given fairness considerations, those with intermediate and high incomes have rather similar preferences concerning transfers to those with low incomes, while the attitudes towards taxing those with high incomes are likely to differ more, with those with high incomes being more distinct and those with intermediate and

low incomes being closer to each other, even so that those with intermediate investment may prefer higher taxes on those with high incomes than those with low investments.

3. Results from the 1998 Gallup Social Audit

The section presents data from a 1998 Gallup Organization social audit (Gallup 1998), a national telephone survey in the United States of 5001 individuals who were 18 years of age or older. The dataset contains measures of beliefs about the roles of effort and luck in explaining why people are poor (WHYPOOR) and rich (WHYRICH), respectively with nearly identical wording and response scales. It also contains one question about support for taxes on the rich (TAXRICH) and one about support for government transfers to the poor (GOVHELPPOOR).[6] Table A1 in the appendix presents the question wording.

We test the null hypothesis that the effect of a target-specific belief on support for redistribution equals the effect of non-target-specific beliefs. Rejecting this null hypothesis in the expected direction would be evidence that target-specific beliefs differ from general beliefs and that they influence demands for redistribution more than other types of beliefs. Our empirical approach addresses a host of measurement problems. It involves estimating the following two equations:

$$TAXRICH_i = \beta_0 + \beta_1 WHYRICH_i + \beta_2 WHYPOOR_i + \mathbf{X}\boldsymbol{\beta} + e_i \qquad (12)$$

$$GOVPOOR_i = \beta_0 + \beta_1 WHYRICH_i + \beta_2 WHYPOOR_i + \mathbf{X}\boldsymbol{\beta} + e_i \qquad (13)$$

Where TAXRICH and GOVHELPPOOR equal one if the respondent supports redistribution and zero if the respondent opposes redistribution, WHYRICH and WHYPOOR increase in beliefs that luck matters (see Table A1), and $\mathbf{X}$ is a matrix of socioeconomic variables. We conduct four tests from these two equations:

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[6] We coded "don't know" responses as missing. Thus, this sample should be interpreted as being drawn from the population of people who know their preferences and are not indifferent. The coding makes little difference for the results.

Prediction 1: In equations predicting GOVHELPPOOR, WHYPOOR has an effect in the expected direction that is larger in magnitude than the effect of WHYRICH. We test the null hypothesis that the coefficient on WHYPOOR = the coefficient on WHYRICH in this equation.

Prediction 2: In equations predicting TAXRICH, WHYRICH has an effect in the expected direction that is larger in magnitude than the effect of WHYPOOR. We test the null hypothesis that the coefficient on WHYPOOR = the coefficient on WHYRICH in this equation.

Prediction 3: The magnitude of the effect of WHYPOOR is larger in equations predicting GOVHELPPOOR than in equations predicting TAXRICH. We test the null hypothesis that the coefficients on WHYPOOR are the same in both equations.

Prediction 4: The magnitude of the effect of WHYRICH is larger in equations predicting TAXRICH than in equations predicting GOVHELPPOOR. We test the null hypothesis that the coefficients on WHYRICH are the same in both equations.

This series of tests rules out a host of alternative explanations, because many econometric problems may bias the results in the direction of one of the predictions, but not all of them. For example if WHYRICH is correlated with income, this could bias its coefficient up in both equations. This would bias the results in favor of prediction 2, but against prediction 1, so it could not explain the predicted *pattern* of results. Furthermore, recall that WHYPOOR and WHYRICH have nearly identical wording and response scales, which helps to hold subjects' interpretations of the questions and the extent of measurement error relatively constant across the two measures. As the following sub-sections will show, the data support all four of the predictions. All reported significance levels are from two-tailed tests.

3.1. Results

Table A2 of the appendix presents summary statistics for the Gallup survey questions used in this paper. According to the dependent measures, 69% of subjects who responded to GOVHELPPOOR said they support governmental redistribution to the poor. Of those who

responded to TAXRICH, 45% support redistribution of wealth by heavy taxes on the rich. Forty-four percent of respondents said that poverty is caused by lack of effort. Fifty-six percent reported that wealth is caused by strong effort. Table A1 also presents summary statistics for the socioeconomic variables and subjective measures of financial security included in the regressions.

Table 2 uses seemingly unrelated regression (SUR) to predict GOVHELPPOOR and TAXRICH. The equations in this table include dummy variables for the response categories to WHYPOOR and WHYRICH. The response that only effort matters is the omitted category. Column 1 presents baseline estimates of the effect of the WHYPOOR and WHYRICH dummies only. Column 2 includes a large number of background variables including dummies for eight income categories (a ninth category is omitted), dummies for seven education categories, age, age squared, sex, a dummy for white, dummies for five marital status categories, a dummy for dependent children living at home, two employment status dummies, and dummies for suburban and rural residence versus urban.

In all models, the effects of believing in luck versus effort are highly significant and in the expected direction (positive). Furthermore, all four of the predictions above are supported. Both the pattern of coefficient sizes and the formal statistical tests show that beliefs about causes of being poor have larger effects on support for transfers to the poor while beliefs about the causes of being rich have larger effects on support for taxation of the rich. All of the statistical tests are significant at the one-percent level.

4. Experimental evidence

This section presents new results from a prior randomized experiment on giving of real money to real-life welfare recipients (Fong 2007) on the effects of target-specific and non-target-specific beliefs on giving of real money to real-life welfare recipients. Full details on the experimental design and procedures are presented in Fong (2007), but we summarize them briefly here. The experiment was an n-donor dictator game in which subjects (dictators) were randomly matched with one of three types of real-life welfare recipients. The welfare recipients differed according to their self-reported work preferences and work histories, but were otherwise identical in terms of the characteristics presented to dictators. About one week prior to the experiment, dictators

completed an online survey with attitudinal measures of beliefs. At the experiment, dictators were paid a show-up fee and endowed with an additional ten dollars to play with during the experiment (the "pie"). In a private room, each dictator read a survey completed by his or her welfare recipient. The survey communicated the welfare recipient's demographic characteristics and work preferences and work histories. The dictator then decided how much, if any, of the ten dollars to give to the recipient. Finally, dictators completed an exit survey with additional belief and attitudinal measures and left the experiment. The dependent variable is the offer made to the welfare recipient. The independent variables are various measures about the causes of income, success and failure and information about the recipient's attachment to the labor force.

The recipients had the same demographic characteristics but differed according to their answers to the questions about work preferences and work histories. Three treatment conditions differed according to information about the recipient that was visible on a survey the recipient had completed. On one condition, subjects were paired with a recipient who reported not wanting to work full-time, not looking for work, and never having held a job for more than one year. In a second condition, each subject was paired with a recipient who reported wanting to work full-time, looking for work, and having held a job for more than one year at some point in the past. In a third condition, we omitted the questions on work preferences and work history from the recipient's survey, so dictators were paired with a recipient for whom this information was unavailable.

We analyze the effects of three independent variables: (i) prior target-specific beliefs about the causes of poverty and failure, which mirror the Gallup WHYPOOOR measure analyzed above, (ii) prior non-target-specific beliefs about the causes of wealth and success, which mirror the Gallup WHYRICH measure analyzed above, and (iii) an exit survey measure of target-specific beliefs about why the dictator's recipient is poor, which we use directly in some specifications and in other specifications we instrument it with the randomly assigned treatment conditions.

[NOTE: The remainder of section 4 is incomplete. The Tables are under revision and are not presented.]

4.1. Effects of prior beliefs on giving

During the week prior to the experiments, subjects visited a web site where they registered for the experiment and completed an attitudinal survey. The survey included seven measures of prior beliefs on a web survey conducted during the week prior to the experiment. Three were target-specific beliefs about the causes of economic outcomes for poor people or people who do not succeed. The other four questions were non-target-specific. Of these, three were general beliefs about chances or opportunities for success for "anyone" or "people" and one was a specific belief about the causes of income for rich people. The exact wording of the questions and their Spearman rank correlation coefficients with offers are presented in Table 3. The table also indicates the source of the question. Four of the questions came from a well-established measure from psychology of the Protestant work ethic (Katz and Hass 1989). The other three are revised versions of questions from the Gallup survey used above.

Panel A presents the target-specific beliefs. It shows that all three of them had significant Spearman rank correlation coefficients with offers, although one of these correlations was just marginally significant with a p-value of .057. Panel B presents the non-target-specific and general beliefs. None of these had significant correlations with offers.

Next, we test whether or not the association between target-specific beliefs and offers is reduced if we control for general or non-target-specific beliefs. Table x presents ordinary least squares regressions (with robust standard errors) predicting offers with the treatment conditions and measures of target-specific beliefs and non-target-specific beliefs. Panel A compares estimates the effects of *WHYPOOR* and *WHYRICH*. In column 1, *WHYPOOR* is included without *WHYRICH*, reporting that lack of effort causes poverty, as opposed to circumstances, decreases offers by an estimated $2.04 (significant at the one-percent level). This is a big effect in dictator games. In column 2, *WHYRICH* is included without *WHYPOOR*. Reporting that hard effort causes wealth, as opposed to circumstances, is marginally significant (p-value = 0.055), but the magnitude of the effect is -$1.28, which is fairly large. Column 3 includes both *WHYPOOR* and *WHYRICH*. Here, the magnitude of both beliefs variables falls, but believing that lack of effort causes poverty remains significant at the five-percent level while believing that hard effort causes wealth has no significant effect.

Panel B conducts the same tests using different beliefs measures. The measure of target-specific beliefs standardizes responses to *Specific1(Katz-Hass)* and *Specific2(Katz-Hass),* then adds them together. Finally, the resulting measure is standardized for ease of interpretation. The measure of general beliefs is constructed in the same way using *General1(Katz-Hass)* and *General2(Katz-Hass).* According to these measures, target-specific beliefs have significant effects in both columns 1 and 3. General beliefs have no significant effect in either column 2 or 3.

Finally, Panel C combines all three measures of target-specific beliefs into a single measure by standardizing each question, adding them up, and standardizing the resulting sum. It combines all four measures on non-target-specific beliefs with the same procedure. The results show that target-specific beliefs have significant effects in both columns 1 and 3. The magnitude of the effect does not fall much in column 3. General beliefs have a significant effect in column 2, but after controlling for target-specific beliefs in column 3, this effect falls to close to zero and becomes statistically insignificant.

4.2. Effects of exit survey beliefs about the dictator's own recipient

The exit survey contained the following question: "Which if the following explains why your recipient is poor? a) lack of effort on his or her part, b) circumstances beyond his or her control or c) both." These beliefs have highly significant effects on offers in the expected direction. However, responses to this question may be endogenous to offers because subjects who gave less money for some reason other than their beliefs about the recipient may rationalize their offers with their beliefs. To create an exogenous measure of target-specific beliefs about the recipient, we instrument the exit survey question with the randomly assigned treatment conditions and the target-specific beliefs measured approximately one week prior to the experiment.

Table xx present the frequencies of responses to the exit survey questions in each treatment condition. The treatment conditions had very strong effects on the exit survey question. For example, the fraction of dictators who said their recipient was poor because of lack of effort was about thirty-six percent in the "lazy" recipient treatment condition. In contrast, less than two percent of dictators in the "industrious" recipient condition reported that their recipient was poor because of lack of effort. According to the Kruskal-Wallis test, we can reject the null hypothesis

that all three of these samples are from the same population at the one-percent level (p-value = .0001). All other tests we tried, including ordered probit and ordinary least squares regressions predicting the exit survey question with treatment conditions, also show highly significant effects of the treatment condition on the exit survey question.

Table xx reports the instrumental variable estimates. The first column shows a highly significant IV estimate of the effect of specific beliefs about why the dictator's recipient is poor.

5. Conclusion

Previous literature has shown that beliefs about causes of income play an important role in redistributive preferences. A major assumption in these analyses has been that beliefs about causes of income are general, applying to all income groups. Yet, we find that 42% of Americans have beliefs about the roles of luck and effort in explaining why someone is rich which differ from their beliefs about why someone is poor. In this paper, we examined both theoretically and empirically what role target-specific beliefs play in explaining demands for redistribution. Our model assumed three different income levels and three different effort levels. Those choosing low effort have always low income. Those making an intermediate effort investment obtain intermediate income if they are lucky and low income if they are unlucky. Those choosing high effort achieve high income if successful, and intermediate income if not. Furthermore, we allowed for a group of entitled rich, who need not invest in effort and receive high income thanks to connections, bequests or other external sources. We assumed that while the income distribution is observable, stochastic processes and individual effort choices are not. Instead, agents start with beliefs about some aspects of the economy, be it the probability of success with a certain type of effort investment or the number of agents choosing different levels of effort, and adjust their beliefs about other parameters so that the endogenous beliefs imply an income distribution which is consistent with the observed income distribution.

A given change in beliefs about the income-generating process can imply either parallel or opposite changes in beliefs about the share of industrious rich (who have made high effort investment and were successful) and industrious poor (who made intermediate effort investment

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but were unlucky). This is a novel result and highlights the need to collect and analyze target-specific beliefs in order to understand redistribution when there are more than two income levels in society – with only two income levels, government budget constraint would force the choice into one dimension. We also showed how our model can be used to explain the political implications of globalization, skill-biased technological change and shrinking middle class, especially when it comes to analyzing separately attitudes towards the rich and towards the poor.

To test our model, we used Gallup data on Americans' beliefs about the role of luck and effort in explaining high and low incomes, and support for transfers to the poor and levying heavy taxes on the rich. We found strong support for our model: beliefs about causes of low incomes are more strongly associated with stated preferences for transfers to/for the poor than with stated preferences for taxing the rich. Similarly, beliefs about causes of high incomes are more strongly associated with stated preferences for taxing the rich than with stated preferences for transfers to the poor. In both cases, the difference is statistically significant and remains when additional controls are included. Furthermore, we find that the effect of beliefs about causes of poverty have a stronger effect on supporting transfers to the poor than on taxing the rich, while beliefs about causes of high incomes have a stronger effect on views about taxing the rich. While it is easy to think about various econometric problems that could bias the results in the direction of one of the predictions, none of them would generate the pattern that our theory predicts and empirical analysis confirms.

Taken together, our findings suggest that we cannot understand redistributive politics with the traditional single-choice models of redistribution. People who believe that the poor are industrious demand more redistribution to the poor but need not make commensurately higher demands for taxes on the rich. Similarly, people who believe that the rich are industrious oppose taxation of the rich, but need not make commensurately lower demands for transfers to the poor. Theoretically, this cannot happen if both taxes and transfers are determined by a single choice and the balanced budget constraint is satisfied. In our model with the middle class, there is an additional margin of adjustment in taxes paid by the middle class.

Table 1. Cross-tabulations of beliefs about why the poor are poor (WHYPOOR) and why the rich are rich (WHYRICH).

	WHYRICH: Strong effort	WHYRICH: Both	WHYRICH: Luck or circumstances beyond his/her control	Total
WHYPOOR: Lack of effort	1,476	110	501	2,087
	70.72	5.27	24.01	100
	55.53	19.64	32.6	43.89
WHYPOOR: Both	262	339	86	687
	38.14	49.34	12.52	100
	9.86	60.54	5.6	14.45
WHYPOOR: Circumstances beyond his/her control	920	111	950	1,981
	46.44	5.6	47.96	100
	34.61	19.82	61.81	41.66
Total	2,658	560	1,537	4,755
	55.9	11.78	32.32	100
	100	100	100	100

Note: Within each cell, the first row states the number of observations, the second line states row percentages and the third line states column percentages.

Table 2. Seemingly unrelated regressions of (1) Support for government transfers to the poor and (GOVPOOR), and (2) Support for taxation of the rich (TAXRICH).

	1a GOVPOOR No additional controls included	1b GOVPOOR Additional control variables included
WHYPOOR2: Both	0.143*** (6.13)	0.147*** (5.98)
WHYPOOR3: Circumstances beyond his/her control	0.266*** (17.99)	0.252*** (16.22)
WHYRICH2: Both	0.0599** (2.43)	0.0618** (2.37)
WHYRICH3: Luck or circumstances beyond his/her control	0.0775*** (5.12)	0.0696*** (4.39)
Constant	0.531*** (49.63)	0.764*** (7.23)
	2a TAXRICH No additional controls included	2b TAXRICH Additional control variables included
WHYPOOR2: Both	0.00981 (0.39)	0.0126 (0.48)
WHYPOOR3: Circumstances beyond his/her control	0.138*** (8.62)	0.124*** (7.42)
WHYRICH2: Both	0.102*** (3.80)	0.0985*** (3.51)
WHYRICH3: Luck or circumstances beyond his/her control	0.228*** (13.85)	0.198*** (11.64)
Constant	0.312*** (26.82)	0.618*** (5.45)
N	4395	4015

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$. Robust standard errors (in parentheses). The omitted category for WHYPOOR and WHYRICH is effort. All hypotheses tests for Predictions 1-4 for coefficients on WHYPOOR3 and WHYRICH3 are statistically significant at the one-percent level. The same tests for coefficients on WHYPOOR2 and WHYRICH2 are by and large significant at the five-percent level.

Table 3. Prior measures of beliefs in experiment on giving to welfare recipients

Variable name (source of survey question)	Exact question wording and responses as coded in data set (prior to standardization).	Spearman rank corr. coef. with offers (p-value)
Panel A: Target-specific beliefs		
Whypoor (revised Gallup)	Which of the following more often explains why a person is poor: circumstances beyond his or her control = 0, both = .5, lack of effort on his or her part = 1	-0.173 (0.038)
Specific1 (Katz-Hass 1989)	Most people who don't succeed in life are just plain lazy. Scaled from 1 (disagree strongly) to 5 (agree strongly).	-0.211 (0.011)
Specific2 (Katz-Hass 1989)	People who fail at a job have usually not tried hard enough. Scaled from 1 (disagree strongly) to 5 (agree strongly).	-0.159 (0.057)
Panel B: Non-target-specific beliefs		
Whyrich (revised Gallup)	Which of the following more often explains why a person is rich: circumstances beyond his or her control = 0, both = .5, strong effort on his or her part = 1	-0.122 (0.147)
General1 (Katz-Hass 1989)	Anyone who is willing and able to work hard has a good chance of succeeding. Scaled from 1 (disagree strongly) to 5 (agree strongly).	-0.110 (0.189)
General2 (Katz-Hass 1989)	If people work hard enough they are likely to make a good life for themselves. Scaled from 1 (disagree strongly) to 5 (agree strongly).	-0.024 (0.773)
USopp (revised Gallup)	There is plenty of opportunity in America today. Anyone who works hard can go as far as he or she wants. Scaled from 1 (disagree strongly) to 5 (agree strongly).	-0.075 (0.374)

Appendix

Table A1. Variable names and exact wording of attitudinal variables in the Gallup data.

WHYRICH? Just your opinion, which is more often to blame if a person is rich –strong effort to succeed on his or her part, or luck or circumstances beyond his or her control?

    1) Strong effort

    2) Both

    3) Luck or circumstances beyond his/her control

WHYPOOR? Just your opinion, which is more often to blame if a person is poor – lack of effort on his or her part, or circumstances beyond his or her control?

    1) Lack of effort

    2) Both

    3) Circumstances beyond his/her control

TAXRICH: People feel differently about how far a government should go. Here is a phrase which some people believe in and some don't. Do you think our government should or should not redistribute wealth by heavy taxes on the rich?

    1) should

    2) should not

GOVHELPPOOR: Some people feel that the government in Washington, DC should make every possible effort to improve the social and economic position of the poor. Others feel that the government should not make any special effort to help the poor, because they should help themselves. How do you feel about this?

    1) The government should help the poor

    2) The poor should help themselves

Table A2. Gallup data summary statistics.

Variable	Obs.	Mean	s.d.
Panel A – Dependent measures			
GOVHELPPOOR	4704	0.694	0.461
TAXRICH	4832	0.450	0.498
Panel B – Beliefs measures			
WHYPOOR			
Both circumstances and lack of effort	4869	0.145	0.352
Lack of effort	4869	0.436	0.496
WHYRICH			
Both good luck and effort	4833	0.118	0.323
Effort	4833	0.561	0.496
Panel C – Control variables			
$10,000 \leq Y < $15,000	4571	0.055	0.228
$15,000 \leq Y < $20,000	4571	0.072	0.258
$20,000 \leq Y < $30,000	4571	0.161	0.368
$30,000 \leq Y < $50,000	4571	0.282	0.450
$50,000 \leq Y < $75,000	4571	0.193	0.394
$75,000 \leq Y < $100,000	4571	0.093	0.290
$100,000 \leq Y < $150,000	4571	0.052	0.222
$150,000 \leq Y	4571	0.033	0.180
High school graduate	4959	0.267	0.442
Technical, trade, or business degree after high school	4959	0.052	0.221
Some college	4959	0.261	0.439
College degree	4959	0.145	0.352
Some post-graduate education or more	4959	0.159	0.366
White	4899	0.814	0.389
Male	4998	0.454	0.498
Age	4925	44.732	16.537
Employed part-time	4961	0.129	0.335
Not employed	4961	0.287	0.453
Suburban resident	5001	0.457	0.498
Rural resident	5001	0.238	0.426
Child under 18 living at home	4967	0.405	0.491

Married	4961	0.557	0.497

Note: All variables are dummy variables except age.

References

Alesina, Alberto and Angeletos, George-Marios, 2005. Fairness and Redistribution: US versus Europe. American Economic Review, 95(4), 960-980.

Alesina, Alberto, Glaeser, Edward and Sacerdote, Bruce, 2001. Why doesn't the United States have a European-style welfare state? Brookings Papers on Economic Activity, 2, 187-278.

Bénabou, Roland and Jean Tirole, Belief in a Just World and Redistributive Politics, Quarterly Journal of Economics, 2006, 121 (2), 699-746.

Besley, Timothy and Coate, Stephen, 1992. Understanding Welfare Stigma: Taxpayer Resentment and Statistical Discrimination. Journal of Public Economics, 48(1), 165-183.

Bowles, Samuel and Gintis, Herbert, 2000. Reciprocity, Self-interest and the Welfare State. Nordic Journal of Political Economy, XXVI, 33-53.

Brewer, Marilynn B. and Miller, Norman, 1996, Intergroup relations. Brooks/Cole Publishing Company, Pacific Grove.

Corneo, G., and H.P. Gruner, 2002. Individual Preferences for Political Redistribution. Journal of Public Economics, 83, 83-107.

Fong, Christina M., 2001. Social Preferences, Self-Interest, and the Demand for Redistribution. Journal of Public Economics, 82(2), 225.

Fong, Christina M, 2007. Evidence from an Experiment on Charity to Welfare Recipients: Reciprocity, Altruism and the Empathic Responsiveness Hypothesis. Economic Journal, 117(522), pp. 1008-1024.

Fong, Christina M., Bowles, Samuel and Gintis, Herbert, 2006, Strong Reciprocity and the Welfare State. In: Serge-Christophe Kolm and Jean Mercier Ythier (Eds.), Handbook on the Economics of Giving, Reciprocity, and Altruism. North-Holland/Elsevier, Amsterdam.

Gallup Organization, 1998. Haves and Have-Nots: Perceptions of Fairness and Opportunity. Gallup Organization.

Katz, I. and Hass, G. R., 1988. Racial ambivalence and American value conflict: correlational and priming studies of dual cognitive structures, Journal of Personality and Social Psychology, 55(6), 893– 905.

Meltzer, A. and Richard, S., 1981. A rational theory of the size of government. Journal of Political Economy, 89(5), 814-927.

Miller, David, 1992. Distributive justice: What the people think. Ethics, 102(April), 555-593.

Moffitt, Robert, Ribar, David and Wilhelm, Mark, 1998. The decline of welfare benefits in the US: The role of wage inequality. Journal of Public Economics, 68(3), 421-452.

Piketty, Thomas, 1995. Social Mobility and Redistributive Politics. The Quarterly Journal of Economics, 110, 551-584.

Rabin, Matthew, 1993. Incorporating Fairness into Game Theory and Economics. American Economic Review, 83(5), 1281-1292.

Walster, E.G., Walster, W. and Berscheid, E., 1978, Equity: Theory and Research. Allyn and Bacon, Boston.

Williamson, John B., 1974. Beliefs about the Motivation of the Poor and Attitudes toward Poverty Policy. Social Problems, 21(5), 734-747.