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Giacomo Corneo and Christina Fong

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WHAT'S THE MONETARY VALUE OF DISTRIBUTIVE JUSTICE?

Giacomo Corneo, Frei Universität Berlin, CESifo, IZA and CEPR
Christina Fong, Carnegie Mellon University

ABSTRACT

What's the monetary value of distributive justice?*

This paper develops a simple theoretical model that can be implemented to estimate the willingness to pay for distributive justice. We derive a formula that allows one to recover the willingness to pay for distributive justice from the estimated coefficients of a probit regression and fiscal data. Using this formula and data from a 1998 Gallup Social Audit, we find that the monetary value of justice in the United States is about one fifth of GDP. We also generalize the model to estimate the value of justice for different types of people (e.g., Republicans, Democrats, urban dwellers, rural dwellers). We find no evidence that the value of justice varies across types of people. This is consistent with the idea that political differences between types are due to differences in the beliefs about the fairness of the market system, rather than differences in the values they place on distributive justice.

Giacomo Corneo
FB Wirtschaftswissenschaft
Institut für Öffentliche Finanzen
und Sozialpolitik Arbeitsbereich
Boltzmannstraße 20
D-14195 Berlin
GERMANY
Tel: (30-838) 5 25 92/99
Fax:(30-838) 5 25 60
Email: gcorneo@wiwiss.fu-berlin.de

Christina Fong
Department of Social & Decision
Sciences
Carnegie Mellon University
208 Porter Hall
Office: PH 223J
Pittsburgh, PA 15213
USA

Email: fong2@andrew.cmu.edu

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1. Introduction

People aspire to live in a just society, a place where "one gets what one deserves, and deserves what one gets". Empirical evidence suggesting the existence of a taste for fairness comes primarily in two forms. Survey studies - including Fong (2001), Corneo and Grüner (2002), and Alesina and La Ferrara (2005) - show that individual beliefs about how fair market outcomes are contribute significantly to explaining individual demands for governmental redistribution of income. Individuals who think that income is determined mainly by family background and luck rather than effort and hard work are much more likely to favor redistribution. Further empirical support comes from experimental game theory. Experimental evidence from bargaining games strongly suggests that desert matters, i.e. players care about a fair distribution of monetary payoffs.[1]

The finding that people care about distributive justice is hardly surprising. It would have been more surprising to find that generations of philosophers, at least since the 4th Century B.C., had spent much of their energies in search of something - namely, distributive justice - that nobody values. So, people seem to desire distrib-

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[1]See, in particular, Eckel and Grossman (1996), and Hoffman and Spitzer (1985). See also Konow (2003) for a review of experimental findings relating to distributive justice and Camerer (2003, Ch. 2), Fehr and Schmidt (forthcoming), and Sobel (2001) for more general reviews of research on social preferences.

utive justice, but how strongly do they care about it in economic terms? How much of their income would they be ready to give up in order to live in a just society?

The current paper aims at estimating the monetary value of distributive justice. To the best of our knowledge, such an attempt is novel. We first develop a theoretical model that can be empirically implemented to elicit the willingness to pay for distributive justice. Then, we employ that model to estimate the value of distributive justice in the United States.

Our theoretical framework is based on a simple model of demand for governmental redistribution of income. Demand is driven by both selfish pecuniary motives and a concern for justice. Similarly to Piketty (1995) and Alesina and Angeletos (2005), we posit that individuals care about fairness - so, they have a willingness to pay for it - but differ with respect to their beliefs about how fair market outcomes are. Individuals who believe market outcomes to be unfair require governmental redistribution to attain justice. Individuals who view the market as a fair mechanism require laissez-faire in order to perceive justice as realized.

What our model achieves is to provide a neat definition of a "general willingness to pay for distributive justice". For an individual who believes that the pre-fisc distribution of income is unfair, her willingness to pay for justice measures the maximal amount of money that she would be ready to sacrifice in order to prevent the actual income distribution from switching to the distribution that would arise under laissez-

faire. For somebody who believes that the pre-fisc distribution is fair, her willingness to pay for justice measures the maximal amount of money that she would be ready to sacrifice in order to switch to laissez-faire. In our model, those two amounts are posited to be equal. They define a general willingness to pay for distributive justice that can be studied empirically.

In order to gauge the willingness to pay for distributive justice, we embed our theoretical framework into a random utility model. Estimating the random utility model requires only measures of support for or opposition to redistribution, beliefs about the fairness of market outcomes, and individual characteristics. As we show below, a simple formula allows one to recover the willingness to pay for distributive justice from the estimated coefficients of a probit regression and fiscal data.

In the current paper, that formula is used to estimate the monetary value of justice in the US. Our estimates, based on data from a large representative sample drawn in 1998, suggest that Americans' average willingness to pay for distributive justice is substantial. We produce various estimates of the value of justice using different measures. According to our estimations, the value of distributive justice in the US roughly amounts to one fifth of its GDP. Expressed in per capita terms, the average monetary value that American households put on distributive justice is estimated at about $17,000 per year.

The rest of the paper is organized as follows. In Sect. 2 we describe our econo-

metric model. Data and measures are discussed in Sect. 3, while Sect. 4 presents our estimation results. In Sect. 5 we show how the model can be generalized to heterogeneous preferences and estimate the generalized model. Sect. 6 concludes.

2. THEORETICAL FRAMEWORK AND EMPIRICAL STRATEGY

Individuals derive utility from the consumption of a numeraire good, C, and from the feeling that the distribution of income among the members of society is just, J. All other determinants of utility being held constant, perceiving the income distribution to be unjust rather than just is assumed to decrease an individual's utility. Utility is assumed to be cardinally measurable and unit comparable and takes the form

$$U = \alpha C + \psi J,$$

where α and ψ are nonnegative scalars. The variable $J \in \{-1, 1\}$ takes the value 1 if the individual thinks that the allocation of resources in society is just and -1 otherwise. So, 2ψ represents the utility gain for the individual if she feels that justice is realized. The individual's monetary valuation of justice is therefore $W = 2\psi/\alpha$: the individual is willing to sacrifice up to $2\psi/\alpha$ units of her consumption to keep justice preserved viz. to establish a just society.

We aim to estimate W, the willingness to pay for distributive justice, taking into account the fact that neither information about U nor J is available.

As shown by the empirical studies discussed in the Introduction, the existence or lack of distributive justice can be related to two factors: the fairness of market outcomes, f, and the governmental redistribution of incomes, R. In first approximation, justice is done if either market outcomes are fair and government does not redistribute or market outcomes are unfair and governmental redistribution occurs.

Let f be 1 if market incomes are perceived to be fair and 0 otherwise. Similarly, let R be 1 if the government redistributes income and 0 otherwise. Then, we have

$$J = 1 \Leftrightarrow \{f \neq R\}$$

$$J = -1 \Leftrightarrow \{f = R\}.$$

Using these relationships, we can express utility as a function of f and R. Namely, an agent's utility may be written as

$$U_R = \alpha C_R + \beta(1 - 2f)$$

under $R = 1$ and as

$$U_N = \alpha C_N + \beta(2f - 1)$$

under $R = 0$. In this formulation, C_R and C_N respectively denote consumption with and without redistribution, while the willingness to pay for justice equals

$$W = \frac{2\beta}{\alpha}, \tag{1}$$

as can easily be checked using the above definition of justice. By way of an example, suppose that market outcomes are unfair: $f = 0$. If there is no governmental redistribution of income, $R = 0$; then, $J = -1$. Since $U = U_N$ if $R = 0$, we obtain $\psi J = -\beta$. Therefore, $\psi = \beta$ and $W = 2\beta/\alpha$. The three remaining cases can be checked in a similar fashion.

Notice that W measures the willingness to pay for distributional justice, not for governmental redistribution. The two notions only coincide if one thinks that market outcomes are unfair.

Assume that individuals support governmental redistribution of income if and only if they achieve higher utility under redistribution. In order to bring this theoretical framework to the data, we express it in terms of a linear random utility model.

Let utility in the case of redistribution be given by

$$U_R = \alpha C_R + \beta(1 - 2f) + x'\gamma_R + \varepsilon_R \tag{2}$$

and utility in the case of absence of any redistribution be given by

$$U_N = \alpha C_N + \beta(2f - 1) + x'\gamma_N + \varepsilon_N. \tag{3}$$

In the above equations, x is a vector of observable individual characteristics, the first element of which is normalized to 1. ε_R and ε_N represent the error terms.

Preferences affect attitudes according to

$$\Pr[d = 1|C_N, C_R, f, x] = \Pr[U_R > U_N], \tag{4}$$

where d is a dummy variable which equals 1 if the agent supports governmental redistribution of income and 0 otherwise.

Let y denote the individual's market income. In the absence of redistribution, market income and consumption coincide, i.e. $C_N = y$. In the presence of redistribution, we assume $C_R = y(1 - t) + z$, where t and z are the parameters of the (affine) redistributive system. According to several empirical studies, e.g. Roemer *et al.* (2003), actual systems of redistribution are described rather well by affineness.

Inserting the above definitions of C_N and C_R in (2) and (3), and substituting the resulting equations into (4), one obtains

$$\Pr[d = 1|y, f, x] = \Pr[\alpha(z - ty) + \beta(2 - 4f) + x'\gamma + \varepsilon > 0|y, f, x], \tag{5}$$

where $\varepsilon = \varepsilon_R - \varepsilon_N$ and $\gamma = \gamma_R - \gamma_N$.[2]

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[2]If we assume that $\gamma_R = \gamma_N = \gamma$ then $x'\gamma$ drops out of the model. Our empirical estimates do not depend much on whether we impose this restriction.

This relationship can be estimated as a binary probit model. Let $\widehat{b}_f = \sigma b_f$ and $\widehat{a}_y = \sigma a_y$ be the estimates of the coefficients on f and y, respectively, where b_f and a_y are probit estimates and σ is the (unknown) variance of the error term of the probit equation.[3]

Note that

$$-\alpha t = \sigma a_y \tag{6}$$

and

$$-4\beta = \sigma b_f. \tag{7}$$

Substituting into (1) yields

$$W = \frac{tb_f}{2a_y}. \tag{8}$$

This formula is the basis for our quantification of the value of justice. By estimating equation (5), we will obtain numerical values for a_y and b_f. The value for t will be taken from studies of national tax-transfer systems.

3. DATA AND MEASURES

The assumptions of the model impose certain requirements on the data. First, the model calls for a measure of pre-tax and pre-transfer income. Second, it calls for a measure of absolute support for and opposition to redistribution rather than support

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[3]To obtain the probit model, one assumes that the distribution of the error is a standard normal and thus $\sigma = 1$. Since in general the variance of the error term cannot be identified, only the ratio of the coefficient to σ is identified.

for more or less redistribution relative to the status quo. Third, it calls for a measure that asks about a general redistributive policy that can achieve justice for society as a whole. Widely available questions that ask about attitudes to "welfare" or "helping the poor" may be inappropriate because they might be interpreted as asking about small means-tested programs such as TANF or the former AFDC in the United States. These programs may help the poor without having much financial impact on those who never expect to qualify for benefits, because the relatively small costs of the program are shared by many taxpayers.

An additional concern is to avoid using "target-specific" beliefs about the fairness of market incomes. When a redistributive policy targets a specific group of people, beliefs about the causes of income for that specific group - referred to as target-specific beliefs - have much larger effects on support for that policy than beliefs about the causes of income for people who are not in the target-group (Fong, 2005).

Finally, the publicly available social surveys tend to contain many "double-barreled" questions - namely, questions that ask about more than one concept at a time. While it is difficult to avoid double-barreled questions altogether, it is important to avoid those that would introduce serious confounds into the analysis. For example, there was a question that simultaneously asked about whether or not the distribution of income is fair and whether or not it should be more equal, thus relating to both our dependent and independent measures. This question is clearly inappropriate.

3.1. Data. With these considerations in mind, we searched a number of social surveys - including the World Values Survey, the General Social Survey, all modules of the International Social Survey Programme, the Eurobarameter surveys, and the German Socioeconomic Panel - for a set of suitable questions. The best data set for our purposes is the Gallup Organization 1998 Social Audit titled "Haves and Have-Nots" (Gallup Organization, 1998). It is a national sample of the United States containing 5001 respondents of the ages 18 years and older. The data set over-samples the poor, so we use sample weights to make it nationally representative. However, the sample weights have little effect on our estimates.

3.2. Measures. Tables A1 and A2 present summary statistics and the exact wording of the attitudinal measures used in our analysis. Our dependent measure of demand for governmental redistribution is a binary variable that asks whether or not *"our government should redistribute wealth by heavy taxes on the rich"*. There are two responses to this question - "should" and "should not" - plus "don't know". Out of the whole nationally representative sample, 44.69% said the government should redistribute, 51.52% said "should not", and 3.79% said "don't know" or did not respond.[4] We code the responses so that support for redistribution is one and opposition to redistribution is zero.[5]

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[4]Throughout this section we report nationally representative weighted proportions. The un-weighted proportions are virtually the same as the weighted proportions.

[5]We code "don't know" as missing, because our model addresses the population of people who know their preferences.

While none of the potential dependent measures in the data sets we searched were perfect, this question is one of the best because it asks about support for general redistribution of wealth - suggesting a large program that is likely to have a substantial financial impact on much of the population, rather than a small program that concentrates its financial impact on the poor. However, the question also describes a program that targets the rich more than the poor, so we are careful to avoid regressing our dependent measure on target-specific beliefs about the causes of wealth.

Beliefs about the fairness of market outcomes are recovered from two survey questions about the roles of effort and circumstances beyond individual control in causing, respectively, poverty and wealth. These questions have nearly identical wording and response scales. The one about causes of poverty is: *"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) Luck or circumstances beyond his/her control, 3) Both, 4) Don't know."* We refer to this question as WHYPOOR. Out of the whole nationally representative weighted sample, 42.80 percent said lack of effort explained why people are poor, 40.59 percent said "luck or circumstances", 13.95 percent said "both", and 2.66 percent said they "don't know" or did not respond.

The question about causes of wealth is: *"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) Luck or circumstances beyond his/her control 3) Both, 4) Don't know. We refer to this question as WHYRICH. Out of the whole nationally representative weighted sample, 53.22 percent said strong effort explained why people are rich, 31.89 percent said "luck or circumstances", 11.34 percent said "both", and 3.56 percent said they "don't know" or did not respond.

Our theoretical model posits people with beliefs that are both "strong" and "general". By strong beliefs, we mean certain beliefs that either effort matters (i.e. that market outcomes are fair) or that luck matters (i.e. that market outcomes are unfair). By general beliefs, we mean beliefs that the causes of income are the same for everyone. That is, the rules of the game are the same for everyone, so that it is possible to hold the general belief that market outcomes are fair. Therefore, when estimating the value of justice, we merely use the sub-sample of respondents who had strong and general beliefs - that is, those who either said that lack of effort causes poverty and strong effort causes wealth or that bad luck causes poverty and good luck causes wealth.

While this way of estimating the value of justice closely follows the theoretical model, it leads us to neglect a considerable amount of information, as about half of our sample does not consist of respondents with strong and general beliefs. Hence, we also investigate a second regression equation, in which beliefs about the fairness

of market outcomes are constructed in a different way. Our second measure of beliefs comes from the survey question: *"Do you think the economic system in the United States is (read and rotate 1-2)? 1) Basically fair, since all Americans have an equal opportunity to succeed OR 2) Basically unfair, since all Americans do not have an equal opportunity to succeed 3) Don't know."* We refer to this measure as ECONFAIR.

The specific advantage of ECONFAIR as compared to the combination of WHY-POOR and WHYRICH is that the former identifies the beliefs of the vast majority of the survey participants. Out of the whole nationally representative sample, 68.00 percent of the respondents said the economic system is "basically fair", 29.41 percent said "basically unfair", and only 2.59 percent said "don't know" or did not respond. We code "basically unfair" as zero and "basically fair" as one. The disadvantage of ECONFAIR is its greater ambiguity compared to WHYPOOR or WHYRICH. While we would like to know whether or not respondents believe the market system to be fair, ECONFAIR asks about the fairness of the economic system, a less precisely defined concept.

In all of our equations, we include annual pre-tax, pre-transfer household income. Income was measured in nine categories. We specify it as a single measure by representing each category with an estimate of the median income of the people in that category. We obtain the category medians for income levels up to $100,000 from

the concurrent March Supplement to the Current Population Survey.[6]   For income levels greater than \$100,000, we estimate the category medians using data on the distribution of income up to \$250,000 or more from the 2000 Current Population Survey.[7]

The remaining control variables were chosen carefully because our project calls for reasonable estimates of the coefficients on both market income and beliefs about the fairness of market incomes. Including a large number of controls has advantages and disadvantages. The main advantage is that it helps address concerns about potential missing variables biases in the coefficient on beliefs about fairness of market incomes. More specifically, including a large number of proxies for current and expected future financial security helps address concerns that the means and variances of current and expected future income may be correlated with beliefs that market incomes are fair and may bias the coefficient on beliefs upward if they are missing or poorly measured. The main disadvantage of including a large number of proxies for financial security is that it introduces multicollinearity with current income and makes it difficult to estimate the coefficient on income.

To assess this trade-off, we examine the sensitivity of the coefficients on the be-

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[6]For each income category in the Gallup survey, there is a set of smaller income categories in the CPS. For each Gallup income category, we use the CPS income category cutoff point that is closest to the 50th percentile.

[7]See Table HINC-07 of the Detailed Household Income Tables: 2000, from the 2001 Current Population Survey March Supplement release.

lief about fairness and on income to specification changes. We present a *minimal specification* that includes only the beliefs measure and income; an *intermediate specification* that controls for age, age squared, four age-group dummies, a dummy for being white, a dummy for being male, the interaction between the dummies for white and male, five education dummies, a dummy for being married, a dummy for having one or more dependent children under the age of 18 in the household, and dummies for living in a suburban area or a rural area (as opposed to an urban area); and a *full specification* that includes additional objective and subjective indicators of socioeconomic position and financial security. These additional controls are: seventy-five occupation dummies, a dummy for being a union member, dummies for being employed part-time and being unemployed (as opposed to being employed full-time), a dummy for owning a home, the value of the household's non-home assets (ten dummies), subjective worries about paying bills (three dummies), and three dummies for having had too little money in the past year to pay for, respectively, medical bills, food, and clothing. The Gallup data set does not include geographical variables (e.g., state of residence). However, the detailed information about occupation, employment status, population density of residence (i.e., rural, suburban or urban), union membership, and so on, control for many of the economic differences between people living in different states.

Fortunately, our sensitivity analysis shows that the coefficients on beliefs about

the fairness of market outcomes are not very sensitive to specification as long as a few standard measures of socioeconomic status are included. This is also consistent with earlier findings that the effect of beliefs about the causes of income on demands for redistribution are not sensitive to specification and are not driven by missing variables biases (Fong, 2001). Thus, we believe that a specification with minimal or intermediate controls for socioeconomic variables will produce more accurate estimates of the value of distributive justice.

4.   BASELINE RESULTS

Table 1 presents the probit results using the measure of beliefs about fairness constructed from WHYPOOR and WHYRICH. The table presents results from the sub-sample of respondents who had strong and general beliefs about the causes of poverty - namely, those who replied either that effort levels cause both poverty and wealth or that luck or circumstances cause both poverty and wealth. Columns 1, 2 and 3 present, respectively, the minimal, intermediate, and full specifications.

Table 1. Probit regressions predicting support for redistribution with the belief that effort levels cause wealth and poverty, rather than luck and circumstances (WHYPOORRICH).

	(1)	(2)	(3)
Fairness belief (WHYRICHPOOR)	-0.820	-0.821	-0.799
	(0.063)***	(0.066)***	(0.071)***
Income/$10k	-0.066	-0.046	-0.028
	(0.009)***	(0.010)***	(0.012)**
White		-0.056	-0.098
		(0.113)	(0.121)
Male		-0.104	-0.104
		(0.145)	(0.157)
White*male		-0.243	-0.295
		(0.161)	(0.168)*
Age		-0.012	-0.016
		(0.025)	(0.026)
Age^2		-0.000	-0.000
		(0.000)	(0.000)
High school graduate		-0.062	0.037
		(0.115)	(0.126)
Technical, trade, or business degree after high school		0.074	0.154
		(0.167)	(0.176)
Some college		-0.275	-0.161
		(0.118)**	(0.131)
College degree		-0.342	-0.209
		(0.132)***	(0.147)
Some post-graduate education or more		-0.276	-0.149
		(0.131)**	(0.154
Child under 18 living at home		-0.029	-0.096
		(0.077)	(0.085)
Married		-0.016	-0.009
		(0.072)	(0.078)
Suburban		-0.156	-0.190
		(0.075)**	(0.079)**
Rural		0.017	-0.008
		(0.088)	(0.095)
Observations	2225	2190	2061
Wald χ^2	250.75	315.03	398.88

Numbers shown are coefficients (robust standard errors in parentheses). * significant at 10%; ** significant at 5%; *** significant at 1%. All equations include a constant. Equation in column 2 also includes four age group dummies. Equation in column 3 also includes four age group dummies, 75 occupation dummies, ten asset dummies, three dummies for not having had enough money to buy food, clothes and medical care in the last year, three dummies for subjective financial worries, and dummies for being unemployed, employed part-time, a home owner, a union member.

Table 2. Probit regressions predicting support for redistribution with the belief that the economic system is fair (ECONFAIR)

	(1)	(2)	(3)
Fairness belief (ECONFAIR)	-0.682	-0.610	-0.613
	(0.047)***	(0.049)***	(0.052)***
Income/$10k	-0.061	-0.046	-0.027
	(0.006)***	(0.007)***	(0.008)***
White		-0.110	-0.147
		(0.078)	(0.083)*
Male		-0.147	-0.182
		(0.104)	(0.110)*
White*male		-0.111	-0.101
		(0.115)	(0.120)
Age		-0.001	-0.008
		(0.017)	(0.018)
Age^2		-0.000	-0.000
		(0.000)	(0.000)
High school graduate		-0.157	-0.075
		(0.079)**	(0.084)
Technical, trade, or business degree after high school		-0.087	0.032
		(0.112)	(0.118)
Some college		-0.412	-0.301
		(0.080)***	(0.089)***
College degree		-0.334	-0.192
		(0.091)***	(0.102)*
Some post-graduate education or more		-0.295	-0.181
		(0.090)***	(0.105)*
Child under 18 living at home		-0.007	-0.046
		(0.053)	(0.057)
Married		-0.052	-0.074
		(0.050)	(0.054)
Suburban		-0.029	-0.034
		(0.052)	(0.055)
Rural		0.058	0.067
		(0.061)	(0.065)
Observations	4362	4289	4035
Wald χ^2	339.78	419.39	528.12

Numbers shown are coefficients (robust standard errors in parentheses). * significant at 10%; ** significant at 5%; *** significant at 1%. All equations include a constant. Equation in column 2 also includes four age group dummies. Equation in column 3 also includes four age group dummies, 75 occupation dummies, ten asset dummies, three dummies for not having had enough money to buy food, clothes and medical care in the last year, three dummies for subjective financial worries, and dummies for being unemployed, employed part-time, a home owner, a union member.

The effect of believing that effort causes wealth and poverty - compared to the omitted category of believing that luck or circumstances cause wealth and poverty - has a negative and highly significant effect on support for redistribution in every specification. The table shows that the coefficient on the belief measure is virtually unaffected by specification changes. When we move from the minimal specification to the intermediate specification, the coefficient on the belief about fairness stays virtually the same, changing from -0.820 to -0.821. When moving from the intermediate to the full specification the magnitude of the coefficient on beliefs stays roughly the same, decreasing by less than three percent (to -0.799).

Income also has a highly significant negative effect on support for redistribution in every specification. However, the coefficient on income is quite sensitive to specification changes. Moving from the minimal to the intermediate specification reduces the magnitude of the coefficient on income by about 30 percent (from 6.58E-6 to 4.58E-6). Moving from the intermediate to the full specification reduces the magnitude of the coefficient on income by about 40 percent (to 2.75E-6). Thus, for the purpose of estimating the coefficient on income, the common practice of including as many control variables as possible is clearly inappropriate.

Table 2 presents the probit results from equations using ECONFAIR to measure beliefs about the fairness of market outcomes. The minimal, intermediate, and full specifications are presented in columns 1, 2 and 3, respectively.

ECONFAIR has a highly significant negative effect on support for redistribution in every specification. Its coefficient is also quite stable across specifications. Moving from the minimal to the intermediate specification decreases the magnitude of the coefficient by eleven percent (from -0.682 to -0.610). When moving from the intermediate to the full specification, however, the magnitude of the coefficient stays roughly the same (-0.613).

Income has a highly significant negative effect in all three specifications. However,

as before, its effect is quite sensitive to specification. Moving from the minimal to the intermediate specification, reduces the magnitude of the coefficient on income by 24 percent (from 6.06E-6 to 4.58E-6). Moving from the intermediate to the full specification reduces its magnitude by about 42 percent (to 2.67E-6).

We conclude from this exercise that the full specification is inappropriate. In the following sub-section, we use the coefficients from our intermediate specification (in column 2 of Tables 1 and 2) to calculate the estimated value of justice.

4.1. Baseline estimates of the value of justice. The value of distributive justice is given by Equation (8). In addition to our estimates of the coefficient on income and the belief that market outcomes are fair, we need an estimate of t, the marginal tax rate of the linear redistributive system.

Our dependent variable asks whether the government should redistribute, without specifying the extent of redistribution. Since redistribution does occur in the United States, a natural interpretation of the survey question is whether the government should keep redistributing at its actual level. Under this interpretation, the t of our theoretical model corresponds to the actual marginal tax rate. Alternatively, the extent of redistribution conjectured by respondents might have been larger than the actual level. However, since we do not know what that conjecture could have possibly been, we stick to the first interpretation and set t equal to the actual marginal tax rate of the US redistributive system. We set $t = 25.56\%$, the marginal tax rate estimated by Saez (2004, Table A) for the US in 1998.[8] One might view this as leading to the estimation of a lower bound for the value of distributive justice in the US.

Range of estimates using WHYPOOR/WHYRICH measure. Table 1 gives us estimates of b_f and a_y for a household with strong general beliefs. Substi-

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[8]Roemer et al. (2003) estimate the US marginal tax rate at 24.3%. However, their estimate refers to 1991. Saez's (2004) estimate for 1991 is 23.11%.

tuting the estimates of b_f, a_y from column 2 of Table 1 and the Saez (2004) estimate of t into formula (8), one obtains an estimated value of distributive justice equal to $22,878.18 for a household with strong general beliefs. This means the following. On average, a US household with strong general beliefs about market fairness - which characterizes about half of US households - is willing to pay $22,878.18 a year to live in a just society.

Based on these estimates, the value of distributive justice for the United States easily obtains. In 1998 (the year the Gallup data were collected) there were 103,874,000 households in the United States (CPS march supplement). Assuming that everybody has the same willingness to pay for justice as that of respondents with strong and general beliefs, the value of justice for the United States is estimated to be $2,376,448,069,320 in 1998. This represents 28.87 percent of the US GDP.[9]

The above computations are based on the sub-sample containing respondents who had strong beliefs. According to our data, that sub-sample represents 48.26 percent of the households in the United States. The remaining 51.74 percent of the sample had weak and/or specific beliefs. Our theoretical model does not make predictions for these individuals. A priori, there seems to be nothing wrong in positing that these individuals have the same willingness to pay for justice as those in the other group. Preferences for justice have no evident relationship to beliefs about the fairness of market outcomes. These beliefs should be related to (indirect) preferences for governmental redistribution, not to (direct) preferences for justice.

The above reasoning notwithstanding, one might be interested in estimating the value of justice under different assumptions about the willingness to pay of those without strong and general beliefs about market outcomes. An extreme assumption would be to posit that those individuals put zero value upon distributive justice.

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[9]The U.S. GDP in 1998 was $8,230,397,000,000 (World Bank 2000).

In this case, the value of distributive justice for the United States is estimated at $1,146,873,838,253. Even according to this extremely conservative assumption, the population of the United States is willing to give up 13.94 percent of its GDP to achieve justice.

Estimate using ECONFAIR measure. Table 2 gives us estimates of b_f and a_y produced by using ECONFAIR and the whole nationally representative sample. Substituting the estimates of b_f and a_y from column 2 of Table 2, along with the Saez (2004) estimate of t into Equation (8) one obtains an estimated value of justice of $17,020.66 per household. Thus, the aggregate value of justice for the whole economy is $1,768,004,036,840 or 21.48 percent of GDP. Note that this estimate falls roughly in the middle of the range of estimates just presented for the WHYPOOR/WHYRICH measure.

5. ESTIMATING THE VALUE OF JUSTICE FOR DIFFERENT TYPES OF HOUSEHOLDS

So far, we have based our estimates on the assumption that individuals have the same utility function. However, one may wonder whether this assumption is appropriate or whether different types within the population value distributive justice differently.

To address this issue, we generalize the theoretical model of Sect. 2 in a straight-forward way. We denote household types by $k = 1, 2, ...K$. Variable $T_k \in \{0, 1\}$ takes value 1 if and only if the household has type k. Types are assumed to affect preferences according to

$$\psi = \beta = \left(1 + \sum_{k=1}^{K} \delta_k T_k\right) \Psi,$$

where Ψ is a constant and δ_k captures the type-specific preferences. The additional

willingness to pay for justice induced by having type k is thus given by

$$W_k = \frac{2\delta_k \Psi}{\alpha},$$

where

$$W = \frac{2\Psi}{\alpha} + \sum_{k=1}^{K} T_k W_k$$

is the total willingness to pay.

Following the same steps as in Sect. 2, we embed this theoretical framework in a random utility model. Now, we have

$$\Pr[d = 1|y, f, x] = \Pr[\alpha(z - ty) + \Psi(2 - 4f) + \Psi(2 - 4f)\sum_{k=1}^{K} \delta_k T_k + x'\gamma + \varepsilon > 0|y, f, x].$$

Let $\widehat{b}_{kf} = \sigma b_{kf}$ be the estimate of the coefficient on fT_k. From

$$-4\Psi = \sigma b_f$$

and

$$-4\Psi\delta_k = \sigma b_{kf},$$

one obtains

$$\delta_k = \frac{b_{kf}}{b_f}.$$

By

$$-\alpha t = \sigma a_y,$$

one then has

$$\frac{2\Psi}{\alpha} = \frac{tb_f}{2a_y}.$$

The additional willingness to pay for justice induced by having type k is thus given by

$$W_k = \frac{tb_{kf}}{2a_y}.$$

Hence, estimating the specific willingness to pay of a household type merely requires the use of appropriate interaction terms.

Table 3 presents estimates of our intermediate specification with additional interaction terms. We estimate the effects of interactions between beliefs and dummies for being white, Republican, politically independent, a rural dweller, and a suburban dweller. The reference category in this regression is a non-white, Democratic urban dweller. Column 1 presents the results using WHYRICH/WHYPOOR in the subsample of respondents with strong and general beliefs. Column 2 presents the results using ECONFAIR in the whole nationally representative sample.

As our findings show, there are no robust interaction effects. The interaction between beliefs and being white is statistically significant in the first column but not the second column. The interaction between beliefs and being Republican is marginally significant in the second column but not the first. No other interaction terms are significant. This suggests that the willingness to pay for justice is fairly constant across types of people. This supports the view that political differences across types of people are due to differences in the beliefs they hold about the fairness of market outcomes rather than the extent to which they care about justice.
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Table 3. Probit regressions predicting support for redistribution with WHY-POORRICH (column 1) and ECONFAIR (column 2). Equations include interactions between fairness beliefs and typ of households.

	(1)	(2)
Fairness belief	-0.390	-0.289
	(0.172)**	(0.125)**
Income/$10k	-0.037	-0.041
	(0.010)***	(0.007)***
White	0.219	0.050
	(0.142)	(0.104)
Male	-0.107	-0.130
	(0.141)	(0.104)
Republican	-0.620	-0.517
	(0.138)***	(0.113)***
Independent	-0.108	-0.177
	(0.116)	(0.092)*
Suburban	-0.131	0.047
	(0.119)	(0.094)
Rural	-0.060	0.131
	(0.142)	(0.112)
High school graduate	-0.079	-0.145
	(0.117)	(0.080)*
Technical, trade, or business degree after high school	0.073	-0.057
	(0.169)	(0.113)
Some college	-0.229	-0.373
	(0.120)*	(0.082)***
College degree	-0.332	-0.302
	(0.134)**	(0.092)***
Some post-graduate education or more	-0.281	-0.292
	(0.134)**	(0.092)***
Fairness belief*White	-0.350	-0.095
	(0.165)**	(0.122)
Fairness belief *Republican	-0.191	-0.248
	(0.175)	(0.132)*
Fairness belief *Independent	-0.179	-0.175
	(0.154)	(0.111)
Fairness belief *Rural	0.174	-0.061
	(0.181)	(0.133)
Fairness belief *Suburban	0.021	-0.088
	(0.154)	(0.114)
Observations	2190	4289
Wald χ^2	380.49	559.03

Numbers shown are coefficients (robust standard errors in parentheses). * significant at 10%; ** significant at 5%; *** significant at 1%. Both equations also include a constant, age, age squared, four age group dummies, a dummy for being married, a dummy for having a child under 18 living at home, and an interaction between white and male.

6. Conclusion

Most people agree that one should get what one deserves, and deserve what one gets. Being a common value, distributive justice can be seen as a collective good that increases the utility of all members of society. The current paper has developed a simple theoretical model that can be empirically implemented to estimate the monetary value of distributive justice.

Our estimates indicate that, in 1998, the value of distributive justice in the United States amounted to about one fifth of GDP. This is substantial and suggests that more research should be done in order to pin down ways in which society can manage to efficiently deliver that good - distributive justice - to its members.

The current paper may be seen as a first attempt to answer an important and complicated question. Needless to say, there are several respects in which the estimation results presented in this paper should be qualified. The theoretical model on which they are based is a very simplified one, which was developed with the kind of data in mind that were available for estimation. Crucially, it defines distributive justice as a dichotomous variable. While this is a reasonable first step into such a complex issue, in reality, perceptions of income justice are more like a continuous variable. Therefore, efforts should be made to develop a framework of analysis by which the willingness to pay for various degrees of distributive justice can be empirically estimated. Extending the current model so as to take into account a richer structure of preferences and a more realistic system of redistribution seems to be a promising avenue for future research. Also with respect to the empirical measures of attitudes and beliefs, those available were far from being ideal. It would be nice to have survey questions that are less vulnerable to multiple interpretations and allow for a finer grid of measurement.

With these caveats in mind, our estimations seem to provide a reasonable order

of magnitude for society's willingness to pay for income fairness. In support of this, results from experimental dictator games point to very similar orders of magnitude. In anonymous settings, dictators are willing to give up about 20 % of their monetary payoff to the other player. This may result from the desire to achieve a fair distribution in the mini-society of the laboratory. Our study suggests that a similar willingness to pay for fairness may be present in real society.

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Data Appendix

7. DATA APPENDIX

Table A1. Exact wording of and responses to measures of dependent variable and beliefs about fairness of market outcomes.

Dependent Variable: "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?"

"Should" (44.69%)

"Should not" (51.52%)

"Don't know "(2.93%)

Non-response (0.86%)

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?"

"Luck or circumstances beyond his/her control" (40.59%)

"Both" (13.95%)

"Lack of effort" (42.80%)

"Don't know" (1.84%)

Non-response (.82%)

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?"

"Luck or circumstances beyond his/her control" (31.88%)

"Both" (11.34%)

"Strong effort" (53.22%)

"Don't know" (2.61%)

Non-response (0.95%)

ECONFAIR: "Do you think the economic system in the United States is (read and rotate 1-2)?"

"1) Basically fair, since all Americans have an equal opportunity to succeed OR" (68.00%)

"2) Basically unfair, since all Americans do not have an equal opportunity to succeed" (29.41%)

"3) Don't know." (1.91%)

Non-response (0.68%)

Percentages shown are estimated nationally representative proportions using sample weights.

N = 5001 (including non-response).

Table A2. Summary statistics for selected regressors.[a]

	N	Est. Mean[b]	S.E.
Continuous Variables			
Income (Constructed by representing each of nine income categories by their estimated medians. Category medians are estimated with data from the concurrent CPS March Supplement.)	4571	46772.19	553.258
Age	4925	44.85	0.282
Age squared	4925	2311.82	28.437
Dummy Variables			
White	4899	0.809	0.006
Male	4998	0.476	0.008
Age group 2 (30-39 yrs.)	4925	0.222	0.006
Age group 3 (40-49 yrs.)	4925	0.204	0.006
Age group 4 (50-64 yrs.)	4925	0.189	0.006
Age group 5 (65-99 yrs.)	4925	0.165	0.006
High school graduate	4959	0.279	0.007
Technical, trade, or business degree after high school	4959	0.053	0.003
Some college	4959	0.269	0.007
College degree	4959	0.11	0.004
Some post-graduate education or more	4959	0.118	0.004
Child under 18 living at home	4967	0.388	0.007
Married	4961	0.541	0.008
Suburban	5001	0.477	0.008
Rural	5001	0.228	0.006
In last year, did not have enough money to buy clothing family needed	4988	0.174	0.006
In last year, did not have enough money to buy food family needed	4989	0.11	0.005
In last year, did not have enough money to pay for medical care	4980	0.218	0.006
Worries that income will not meet bills: most of the time	4971	0.444	0.008
Worries that income will not meet bills: some of the time	4971	0.119	0.005
Worries that income will not meet bills: almost never	4971	0.094	0.005
Union member	4966	0.108	0.005
Employed part-time	4961	0.129	0.005
Not employed	4961	0.307	0.007
Non-home assets >$0<$1000	4453	0.029	0.003
Non-home assets ≥$1000<$5000	4453	0.057	0.004
Non-home assets ≥$5000<$10,000	4453	0.067	0.004
Non-home assets ≥$10,000<$30,000	4453	0.162	0.006
Non-home assets ≥$30,000<$50,000	4453	0.109	0.005
Non-home assets ≥$50,000<$75,000	4453	0.068	0.004
Non-home assets ≥$75,000<$100,000	4453	0.047	0.003
Non-home assets ≥$100,000<$250,000	4453	0.079	0.004
Non-home assets ≥$250,000<$500,000	4453	0.032	0.003
Non-home assets >$500,000	4453	0.032	0.003

[a] The full specification includes 75 occupation dummies that are not summarized in this table.

[b] Means are estimated from the nationally representative weighted sample.