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Individual social welfare preferences: An experimental study ☆

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ABSTRACT

This paper studies individual social welfare preferences when facing a trade-off between equality and efficiency using a modified distribution game in which subjects decide the income of two other subjects under different budgets and different "prices of equality." We found that over half of the subjects made choices consistent with the generalized axiom of revealed preference. We then estimated individual social welfare preferences and found that the subjects had a wide range of preferences for equality and efficiency, although the majority weakly preferred efficiency over equality.

1. Introduction

Many real-world situations require individuals to make impartial decisions. A jury needs to come to a just verdict, an arbitrator needs to settle a dispute fairly, and a politician needs to act for the well-being of the people he or she serves. In each of these cases, it is socially expected that the decision-maker will base his or her decision on what is best for the welfare of society rather than self-interest. Indeed, although it is reasonable to assume that self-interest influences individuals' decisions to a degree, significant research suggests that concerns about social welfare likewise figure prominently in decisions made across a wide variety of situations. For example, researchers have found that voters' ideological dispositions, rather than self-interest, occupy the central role in their attitudes toward welfare assistance (Alesina and Glaeser, 2004; Funk and Garcia-Monet, 1997; Funk, 2000; Linos and West, 2003).[1]

Experimental economists have investigated social welfare preferences for individuals who make distribution decisions as uninvolved social planners (see Gaertner and Schokkaert, 2011, for a comprehensive review of the literature). In doing so, researchers' common practice is to assume homogenous preferences among the subjects and thereby estimate a uniform welfare function for all subjects rather than to estimate individual social welfare functions. Yet social welfare preferences can, of course, be heterogeneous. In this paper, we explore such individual preferences when facing the tradeoff between equality and efficiency. Okun (1975, p. 91) has captured this tradeoff vividly in his leaky-bucket thought experiment: "If the money must be carried from the rich to the poor in a leaky bucket… I want you to decide how much leakage you would accept and still support [this plan]." Much of modern democratic politics centers on this tradeoff, and individuals' preferences in this regard are fundamental inputs in the political process. Therefore, it is important to understand individual opinions on the tradeoff between equality and efficiency.

In order to examine this tradeoff, we designed and implemented a modified distribution game in which individuals decide the income of two other subjects under different budgets with different "prices of equality." This approach allowed us to study social welfare preferences at the individual level and test choice data for consistency. In our experiment, each subject was asked to distribute a budget between two other subjects as if he or she were a social planner (SP). The two other subjects were designated different abilities to convert the money transfers into income. The SP then faced a leaky-bucket type of tradeoff between equality and efficiency; a more equal distribution entailed a larger efficiency loss as the gap between the two other subjects' abilities increased. As a result, the ratio of ability between the high-ability subject and the low-ability subject can be interpreted as the price of equal distribution (or simply the

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[1] Researchers have also found that while changing macroeconomic conditions have a strong influence on individuals' voting decisions, individuals' personal financial evaluations have only a weak-to-nonexistent influence (Grafstein, 2009; Lewis-Beck and Stegmaier, 2000, 2007; Lewis-Beck, Norpoth, and Jacoby, 2008; Markus, 1988, 1992). This suggests that people may be more likely to vote in accordance with their impartial social preferences than their individual gains and losses.

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price of equality). We conducted twenty rounds of this experiment to allow the SP's budget and the price of equality to vary between rounds.

Among the 144 subjects, 56.9% made choices strictly consistent with the generalized axiom of revealed preference (GARP). In addition, 75% (108 subjects) made choices that almost satisfied GARP. As subjects' decisions did not affect their own monetary payoffs, this result implies that most subjects had coherent social welfare preferences regarding income distribution.

In addition, we found that the SPs tended to allocate a smaller share of the budget to the subject with a lower ability level when the price of equality increased. In particular, the ratio of income given by the median SP to the high-ability subject and the low-ability subject increased with price. This ratio was almost always smaller than the price when the latter was smaller than or equal to 5 and was larger than the price when the latter was larger than 5, thereby providing a pro-efficiency answer to Okun's leaky-bucket question.

We then estimated individual social welfare functions under the constant elasticity of substitution (CES) utility function. We found that the estimated values of the elasticity of substitution had a multimodal distribution, ranging from negative infinity (utilitarian preference) to zero (Rawlsian preference). However, a majority of the 108 subjects for whom we estimated preferences showed a weak preference for efficiency with the elasticity of substitution between -4 and -1. The median subject had an elasticity of substitution of -1.20, which indicates that he or she had a mild inclination towards increasing total payoffs rather than towards reducing inequality in payoffs.

In contrast to Konow (2009), we found that several individual and social characteristics affect subjects' approaches to the equality–efficiency tradeoff. Female students; older students; students who were majoring in the humanities, medical sciences, or engineering; and students from low-income families allocated more to the subject with a lower level of ability. Subjective political attitudes were only weakly correlated with subjects' allocations after controlling for other characteristics.

The remainder of the paper is organized as follows. Section 2 provides a short review of the related experimental literature in order to highlight our contribution to the literature. Section 3 describes the design of our experiment. Section 3 reports the main results. Section 4 concludes the paper and suggests directions for future research.

2. Literature review

Researchers have generally studied two types of decision-making regarding income distributions. In the first type of decision-making, individuals are considered to face a tradeoff between their own payoffs and others' payoffs. Substantial evidence has shown that large numbers of people are not just motivated by self-interest in this kind of decision-making. This discovery has led to a large body of literature on "other-regarding preferences" or "social preferences" that tries to incorporate altruism, inequality aversion, and efficiency concerns into its analysis of individuals' decision-making processes. Notable examples of this include the inequality aversion model by Fehr and Schmidt (1999), the equity—reciprocity–competition model by Bolton and Ockenfels (2000), and the reciprocity model by Charness and Rabin (2002).

The modified dictator game, designed by Andreoni and Miller (2002), has advanced the literature on decision-making by allowing them to test choice data for consistency and estimate individual preferences. This is made possible by an experimental design in which each subject chooses how much to give under different budgets with different prices of giving. Researchers have subsequently applied this "multiple-budgets" approach to recover individual preferences in a study of charity giving (Eckel and Grossman, 2003), risk aversion (Choi, Fisman, and Gale, 2007), bargainers' preferences (Andreoni, Castillo, and Petrie, 2003), and warm-glow preferences (Korenok, Millner, and Razzolini, 2013).

In the second type of decision-making, individuals act as social planners whose own incomes are not at stake. Studies of this type of decision-making are collectively referred to as the body of literature on "social welfare preferences." Traub et al. (2009) have shown that uninvolved social planners are generally less inequality-averse than self-interested social planners are, and the former are more likely to exhibit randomized preferences. However, Amiel, Cowell, and Gaertner (2009) have found that German and British subjects who imagine themselves as unaffected observers are more inequality-averse than peers who imagine themselves as affected by income distribution decisions. For Israeli subjects, however, the pattern is exactly the opposite.

Because it is difficult to observe distributional choices that do not affect one's own payoffs in real life, researchers have relied on both questionnaire and experimental approaches. In questionnaire studies, subjects rank or choose between different income distributions under certain social contexts (Amiel, Cowell, and Polovin, 2001; Amiel, Cowell, and Gaertner, 2009; Bernasconi, 2002; Bosmans and Schokkaert, 2004; Carlsson, Daruvala, and Johansson-Stenman, 2005; Faravelli, 2007). In experimental studies, subjects make choices that bear monetary consequences: the subjects choose between different distributions of monetary payoffs for other subjects (Michelbach and Scott, 2003; Engelmann and Strobel, 2004; Traub et al., 2005; Traub, Seidl, and Schmidt, 2009). All of these studies, however, analyze data at the aggregate level, by either pooling the subjects to test distributive principles or estimating a homogenous social welfare function for all subjects.

Our experiment adopts the modified dictator game to study social welfare preferences. The rich data generated by our experiment allow us to recover social welfare preferences for our subjects at the individual level. By testing the data for consistency, we avoid the potential problem of using the choices of inconsistent subjects to estimate social welfare functions. However, our game is also different from the modified dictator game. While the modified dictator game studies distribution between self and others,[2] our game studies the distribution among anonymous others. In the modified dictator game, self-interest, efficiency, and equality are all at stake for the decision-maker. Here, however, we focus on a situation in which subjects face a tradeoff between equality and efficiency alone. In most cases, one cannot simply expect that an individual will apply the same distributive principle to the two scenarios.

Our experiment is related to studies that implement the leaky-bucket experiment in the laboratory, such as those of Amiel, Creedy, and Hurn (1999), Beckman, Formby, and James Smith (2004), and Camacho-Cuena, Neugebauer, and Seidl (2007). The difference between our game and those of the others lies in the fact that our game generates a larger set of data regarding individual choices, thereby allowing us to test for consistency. Moreover, the leaky-bucket experiment measures the efficiency-equality tradeoff in the context of redistribution, while our experiment measures it in the context of distribution.

3. Experimental design

In our modified distribution game, each subject plays the role of SP and is asked to determine the payoffs of the other two subjects in

[2] Fisman, Kariv, and Markovits (2007) have estimated distributional preferences using a three-player modified dictator game in which each subject distributes money between him- or herself and two other subjects. The researchers' estimation of distributional preferences depends on the assumption that the choice of distribution (other versus other) is independent of the choice of giving (self versus others). To the best of our knowledge, there has been no such endeavor in the literature to test this assumption.