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Choice set, relative income, and inequity aversion: An experimental investigation

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ABSTRACT

Inequity aversion preference has been widely applied in interpretations of various economic behaviors. A rapidly growing literature has been attempting to measure the strength of inequity aversion preferences as accurately as possible. We vary two factors that might affect the accuracy of the measurement of inequity aversion preference, i.e., choice sets with different underlying inequity aversion strength ranges and with different relative income inequities while absolute income inequities remain fixed. We find that unidirectional changes in the choice sets for disadvantageous and advantageous inequity aversion preferences significantly bias the measured strength of both preferences in the same directions of the changes and that the variance in inequity aversion increases with the range of choice sets. Moreover, a decrease in relative income inequity raises the measured strength of advantageous inequity aversion but does not affect disadvantageous inequity aversion preference. Our results suggest controlling for choice sets and relative income inequity between players to improve the measurement accuracy of inequity aversion preference.

1. Introduction

A growing literature based on controlled experiments has provided solid evidence regarding the deviations from pure self-interested behaviors that result from fairness concerns (for a review, see Fehr & Gächter, 2000). These studies find that fairness is one of the key motivations in addition to self-regarding preference that drive people's behaviors. Studies in behavioral economics refer to people's concern for fairness as "inequity aversion preference", which indicates that people are willing to relinquish their self-interests to promote fairness (Bolton & Ockenfels, 2000). Some early studies employed empirical observations and experimental tests to find preliminary evidence for how inequity aversion preference influences people's economic behaviors (e.g., Bewley, 1999; Camerer & Thaler, 1995; Kahneman, Knetsch, & Thaler, 1986). Since then, inequity aversion has been gradually incorporated into traditional economic models and has made various seemingly irrational behaviors more understandable (e.g., Bolton & Ockenfels, 2000; Charness & Rabin, 2002; Dufwenberg & Kirchsteiger, 2004; Falk & Fischbacher, 2006; Fehr & Schmidt, 1999; Levine, 1998; Rabin, 1993). All of these theoretical works have attracted increasing attention and, importantly, laid the foundation for subsequent studies. Among all of these works,

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the F&S model, developed by Fehr and Schmidt (1999), has become increasingly influential and has been frequently cited as one of the most important contributions to the economics literature in recent decades.[1]

Given the success of the F&S model, it becomes important to accurately measure the strengths of the two types of inequity aversion preferences in the model, i.e., aversion to advantageous inequity (advantageous inequity aversion) and aversion to disadvantageous inequity (disadvantageous inequity aversion). Beginning with Fehr and Schmidt (1999)'s use of a public goods game to measure the strength of inequity aversion at the aggregate level, subsequent studies have used various games in attempting to measure inequity aversion at the individual level instead (Bartling, Fehr, Maréchal, & Schunk, 2009; Blanco, Engelmann, & Normann, 2011; Bolton & Ockenfels, 2006; Dannenberg, Riechmann, Sturm, & Vogt, 2007; Engelmann & Strobel, 2004; Güth, Levati, & Ploner, 2009; Kerschbamer, 2010; Yang, Onderstal, & Schram, 2016). Nevertheless, these studies find mixed evidence when they have attempted to use measured preferences to explain and predict subjects' economic behaviors using a within-subject design. Dannenberg et al. (2007) find that advantageous inequity aversion is able to explain people's behaviors in a social dilemma game. Yang et al. (2016) also show that the F&S model has fairly strong explanatory power with respect to subjects' behaviors in the production game, in terms of both the irrational phenomena and the strength of the irrationality. However, using a simple distribution experiment, Engelmann and Strobel (2004) find that the models proposed by Fehr and Schmidt (1999) and Bolton and Ockenfels (2000)[2] are not able to interpret people's distributive behaviors. Blanco et al. (2011) conclude that the F&S model's predictive power is limited at the individual level, although they demonstrate that inequity aversion motivates decision makers' behavior.

Methodological differences in measuring inequity aversion preferences might be an important contributing factor for the inconsistent explanatory power of these preferences across studies. Moreover, different measurement methodologies can also lead to variations in the strengths of inequity aversion preferences as measured individually across laboratory experiments based on the F&S model. For instance, both the α and β parameters measured by Dannenberg et al. (2007) and Blanco et al. (2011) are larger than those in Yang et al. (2016). The discrepancies in the values of the parameters may be partially driven by the difference in the choice range in the menus used in the two former papers, which imply an upward-skewed distribution range for both parameters, and by the underlying differences in relative income inequities associated with their choice menus. The first factor refers to the restrictions on the available choice set that might affect behavior, and the second factor is linked to the essence of decision makers' perception with respect to fairness, which might partially be driven by the proportion of one's income compared to others' income.

In this study, we investigate the possible influences of these two factors on inequity aversion preference measurement by conducting an experiment with students from Spare-Time College who should be more representative of the general working population. Specifically, we unidirectionally extend the choice menus designed by Yang et al. (2016) with choices implying more extreme underlying values of inequity aversion strength. Furthermore, we manipulate the relative income inequities in the choice menus while keeping absolute income inequities fixed. Our results show that the measured strengths of the disadvantageous and advantageous inequity aversion preferences are significantly biased by the unidirectional changes in the choice sets in the same directions of the changes and that the measured variance in inequity aversion increases with the range of choice sets. A decrease in relative income inequity raises the measured strength of advantageous inequity aversion but does not affect that for disadvantageous inequity aversion.

The remainder of this paper is organized as follows: Section 2 briefly reviews related studies. Next, our experimental design and results are presented in Sections 3 and 4, respectively. We conclude in Section 5.

2. Previous literature and hypotheses

Our study is built on the theory of Fehr and Schmidt (1999). There are two main assumptions made in the F&S model: (i) in addition to completely selfish people, there is another group of people whose utilities are affected by other people's income; and (ii) in general, humans do not like "unequal" income distributions, i.e., they gain lower utility when there are gaps between others' income and their own income compared to when incomes are equally distributed. Moreover, people generally suffer more from inequity that is to their material disadvantage than they suffer from inequity that is to their material advantage (Loewenstein, Thompson, & Bazerman, 1989). Based on these assumptions, the F&S model is presented formally as:

$$U_i(x) = x_i - \alpha_i \frac{1}{n-1}\sum_{j\neq 1}\max\{x_j - x_i, 0\} - \beta_i \frac{1}{n-1}\sum_{j\neq 1}\max\{x_i - x_j, 0\}, \quad (1)$$

where n denotes the total number of participants in the game. Each player is denoted as i ($i = 1, 2, \ldots, n$). $x_i = x_1, \ldots, x_n$ refers to each player's material payoff. In that utility function, α is called the envy parameter, which captures the strength of utility loss from disadvantageous inequity, whereas β is called the guilt parameter, which captures the strength of utility loss from

[1] Fig. A1 and Table A1 in Appendix A, respectively, present the total number of citations of Fehr and Schmidt (1999) across years and compare the citations of this paper to those of other influential papers by Nobel laureates in related fields.

[2] Bolton and Ockenfels (2000) propose an inequity aversion model that takes relative inequity aversion into account compared to the F&S model concerning absolute inequity aversion. This work has also been highly cited since its publication.