RESEARCH ON ECONOMIC INEQUALITY

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RESEARCH ON ECONOMIC INEQUALITY, VOLUME 29

RESEARCH ON ECONOMIC INEQUALITY: POVERTY, INEQUALITY AND SHOCKS

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INTRODUCTION

Sanghamitra Bandyopadhyay

Research on Economic Inequality, Volume 29, Poverty, Inequality and Shocks contains 11 chapters that present novel methods and empirics about measuring poverty, inequality and wellbeing, with particular reference to the impact of economic shocks. The volume was conceived when the Covid-19 pandemic had an already unprecedented impact on poverty and wellbeing in developed and developing countries alike and presented formidable challenges for policy makers. The chapters presented in this volume bring together thinking that has occupied the recent inequality and poverty measurement literature in light of this current unprecedented global shock.

The volume opens by addressing some theoretical questions that are at the frontier of the literature on the measurement of poverty and welfare. In Chapter 1, Gordon Anderson and Rui Fu provide a thoughtful contribution on using scale independent instruments to measure levels of wellbeing and inequalities between groups in multidimensional ordered categorical environments. Wellbeing evaluation using ordered categorical response data is usually difficult due to the scale dependent nature of most measures of wellbeing and inequality. As a solution to this problem, they propose scale independent instruments to study health and consumption wellbeing in light of the aging process in China. Crucially, they consider factors such as age, gender and location as circumstances beyond an individual's control that impacts upon their ability to consume and achieve health status. Using multidimensional indices which deal with the lack of cardinality, they compare aggregate wellbeing across groups defined by gender, age and location. They thereafter employ multilateral, multidimensional distributional comparison techniques to examine the extent to which there is equality of opportunity for wellbeing among those groups. The chapter concludes with an illustration examining the health and consumption wellbeing relationship in light of the impact of Dibao, China's social assistance program, introduced in the early twenty-first century.

Chapter 2 touches upon long-discussed measurement issues involving the Ravallion and Chen growth incidence curve, which measures pro-poor growth

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at each percentile of the distribution (ranked by income or consumption per person). Highly popular in use, however, its distribution-free estimator is prone to mismeasurement at the tails of the distribution. Edwin Fourrier-Nicolaï and Michel Lubrano propose a series of parametric models based on quantile functions in a Bayesian framework to tackle this problem. As a solution, they model the underlying income distribution using densities whose quantile function has a closed analytical form. They also extend their analysis with a mixture model for the underlying income distribution, where the quantile function is evaluated numerically. As a further solution, they work directly with the Lorenz curve to obtain a corresponding quantile function. With a special focus on the analysis of subgroups, they compare the relative performance of these models with Monte Carlo simulations, and illustrate their proposed models using the UK Family Expenditure Survey for the period of 1979 and 1996.

In the following two chapters novel solutions are introduced for the measurement of poverty under different circumstances. In Chapter 3, Maria Grazia Pittau, Roberto Zelli and Saida Ismailakhunova provide innovative solutions for measuring the probability of being poor in a dynamic setting with particular regard to the identification of factors that cause impoverishment. Their contribution follows from the current approach in poverty measurement of identifying both macroeconomic factors and socio-economic factors that impact upon impoverishment. They separate idiosyncratic shocks from aggregate shocks that impact upon poverty to estimate a dynamic logistic hierarchical model within a Bayesian framework, by employing Markov chain Monte Carlo techniques. On examining the Kyrgyz Republic's case for years 2013–2017, they find that household poverty risk varies significantly across regions and that this variation is explained by both regional and national predictors over time.

In Chapter 4, Pundarik Mukhopadhaya and Jacques Silber provide a thoughtful consideration for measuring poverty when presented with ordinal variables, such as self-assessed health, by introducing innovations to the Bennett and Hatzimasoura index. They bring together several methodological contributions in the recent literature such that their proposed index is particularly useful for policy makers. In particular, they propose how the Bennett and Hatzimasoura index may be broken down to account for the effects of changes in the headcount ratio, the average rank-gap ratio and the coefficient of variation of the ranks among the healthy poor. Using Eurostat data on self-assessed health in 29 European countries they also undertake comparisons between countries for first and second order stochastic dominance.

In Chapter 5, Frank A. Cowell and Emmanuel Flachaire offer a careful reflection on a problem faced by empirical researchers when measuring inequality with ordered categorical data. For analyzing inequality using cardinal entities, such as income or wealth, the concepts of minimum and maximum inequality are easily derived using a standard tool (like the Lorenz curve). However, researchers encounter a crucial problem when dealing with ordered categorical data, namely that the minimum and maximum inequality concepts are not easily derived. To resolve this problem, they show that for ordered categorical data the concepts of minimum and maximum inequality are dependent on preliminary choices made

about the status and the sensitivity parameter. They conclude that maximum inequality can be given by the distribution which is the most concentrated in the top or bottom category, or alternatively by the uniform distribution.

The following two chapters propose some empirical innovations in measuring the inclusiveness of economic growth. In Chapter 6, Suman Seth and Sabina Alkire employ novel methods to measure the inclusiveness of growth using the multidimensional poverty index (MPI) for Indian states. They use a battery of elasticity measures of inclusive growth using the Alkire and Foster multidimensional poverty methodology where each of these measures describe different forms and components of inclusivity. In order to measure the impact of inclusiveness, they estimate growth elasticities for the MPI to assess the speed at which the Indian states experienced a drop in poverty due to economic growth between 2006 and 2017. They use auxiliary measures to identify factors such as population subgroups that contribute toward the inclusiveness of growth. Strikingly, the growth elasticity of the MPI in India is estimated to take a value of 1.34, though there is significant variation observed around this value for the Indian states. The measures are specifically tailored to assist policy makers in measuring inclusive growth and to inform policy.

In Chapter 7, Osnat Peled and Jacques Silber propose a new approach to measure pro-middle class growth using recent innovations in the literature of intermediate polarization. They obtain a sufficient condition that for growth to be pro-middle class, growth of the "intermediate median income" of the population should be higher than the weighted average of the growth rates of the rich and smaller than the weighted average of the growth rates of the poor. Employing their method they find that absolute growth was not pro-middle class for any income type for Israel between 1997 and 2018. However, growth was found to be pro-middle class in relative terms for economic incomes and net equivalized income. Remarkably, growth was not found to be pro-middle class for net incomes, even in relative terms. They deduce this finding to be a result of the combined effect of developments in labor force participation, welfare policy changes and major changes in income tax rates.

In Chapter 8, Joaquín Prieto-Suarez provides some empirical innovations in analyzing the dynamics of mobility in Chile. He uses dynamic panel ordered probit models to separate the specific effects of state dependence and heterogeneity to explain a variety of measures of income position persistence, such as poverty persistence and affluence persistence. Upon using longitudinal data from the Chilean dataset P-CASEN 2006–2009 for years from 2006 to 2009, he finds significant income position mobility at the bottom and the top of the income distribution. The results of mobility are, however, revealed to be associated with economic insecurity rather than "upward mobility." In addition, he also finds that individual socio-economic factors are a stronger determinant of individuals' current income position in the income distribution.

Finally, the following three chapters are empirical investigations on the impact of Covid-19 on households in three different scenarios. In Chapter 9, Giorgia Menta undertakes a thorough examination of the dynamics of income distributions and poverty rates under the influence of Covid-19 restrictions in

five European countries, namely, France, Germany, Italy, Spain and Sweden. Using real-time data from the University of Luxembourg's "COME-HERE" nationally representative panel survey of over 8,000 individuals, the chapter reveals that poverty rates rose significantly in all five countries between January and May 2020, with a drop in September 2020. Of these countries, Italy experienced the greatest rise in poverty and France the least. She also finds that, within these countries, Covid-19 contributed to exacerbating differences in poverty across regions for Italy and Spain. Using poverty measures from the Foster–Greer–Thorbecke family, poverty increased disproportionately more for young individuals, women and for respondents who had a job in January 2020.

In Chapter 10, Romina Gambacorta, Alfonso Rosolia and Francesca Zanichelli focus on the impact of the Covid-19 pandemic on wealth poverty in a set of European countries. Using a unique harmonized survey, namely the Household Wealth and Finance Consumption Survey with household balance sheets, the authors distinguish between wealth poverty and income poverty and find some stark differences experienced by the households and across countries. Remarkably, they find that the incidence of wealth poverty has varied significantly between countries and households (between 20 and 90 percent of the population) compared with income poverty (between 15 and 30 percent of the population). They also find that the countries' household incomes widely differ in their responsiveness to the shock depending upon the relative share of their incomes drawing from high-risk sources. Most strikingly, they deduce that even after factoring in household wealth as a mitigating factor, the percentage of households who would fall below threshold poverty levels is as high as 39 percent in Greece and below 20 percent for only two countries, namely, Austria and Malta.

Finally, in Chapter 11, Maria Emma Santos, Martin José Napal and Gimena Ramos examine the impact of the Covid-19 crisis and lockdown measures on several dimensions of poverty in a slum area of the Argentinean city Bahia Blanca by evaluating primary data collected after four months of the first lockdown. They find overwhelming evidence of a disproportionate impact of the lockdown on the impoverished slum compared to the city as a whole. In particular, they find that the proportion of jobless households more than doubled and the ratio of the slum's unemployment rate to the city's unemployment rate increased from threefold to fourfold. Critically, they find that the cash transfer policies implemented by the Argentinian government over the lockdown were not sufficient to mitigate the impact of the loss in income, and that in-kind food aid provided by the municipal government, schools, the Catholic Church and social organizations were crucial for households in the slum. In spite of these transfers, they document significant food insecurity, both in terms of food insufficiency as well as in terms of the variety and nutritional content of the diet.

CHAPTER 1

MULTILATERAL WELLBEING AND INEQUALITY MEASUREMENT WITH ORDERED CATEGORICAL DATA: HEALTH, CONSUMPTION AND THE AGING PROCESS IN CHINA

Gordon Anderson and Rui Fu

ABSTRACT

Wellbeing evaluation using ordered categorical response data is hazardous given the scale dependent nature of most measures of wellbeing and inequality. Here, scale independent instruments for measuring levels of wellbeing and inequalities between groups in multidimensional ordered categorical environments are introduced and applied in a study of health and consumption wellbeing and the aging process in twenty-first century China. Urban/rural location, gender, age and the availability of welfare support were considered circumstances in what is in essence a study of equality of opportunity in the acquisition of health and consumption wellbeing in Chinas' aging population. Older populations are found to experience diminished and increasingly diverse wellbeing outcomes that are, to some extent, ameliorated by welfare support.

Keywords: Wellbeing measurement; ordering distributions; ordinal data; China; aging process; inequality

JEL classifications: C14; I14; I30; I31

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INTRODUCTION

The emergence of aging populations in many societies across the globe has stimulated interest in the aging process and its connection with wellbeing. Health, in contributing to an individual's functioning capability (Sen, 1985), is an important component in the process, especially for vulnerable populations such as the elderly, indeed, some argue that it should have primacy over consumption in their wellbeing calculus (Anand, 2004). Welfare programs, in providing support for the elderly and the poor especially in terms of their health outcomes, are also integral to the process. Given its aging population (a consequence of the one child policy), its unprecedented economic growth and its recently developed welfare program (Dibao), China is of particular interest in this respect. While Gao (2017) has provided an extensive analysis of the impact of Dibao on work and welfare, little has been done to examine the health–consumption–aging wellbeing nexus and the impact that Dibao may have had in those dimensions.

Unquestionably health and consumption are interrelated with respect to the aging process (Pritchett & Sommers, 1996; Wagstaff et al., 1989) and should be considered jointly in developing measures of wellbeing. Herein lays a difficulty since, unlike income and consumption measures, self-reported health or happiness (SRH) measures are ordinal, categorical variables, bereft of cardinal content, yet they need to be accommodated in the wellbeing calculus which tends to be inherently cardinal in nature. Frequently in the literature this is achieved by attaching a Cantril-type scale (Cantril, 1965) to ordinal categories; however, Kahneman and Krueger (2006), Schroder and Yitzhaki (2017) and Bond and Lang (2019) all warn of the dangers of such an approach because of the scale dependency induced by such a practice. The problem is that results are not robust to the use of alternative, equally valid, scale choices and the conditions necessary for coherency of results across alternative scales rarely hold in practice (Bond & Lang, 2019 confirm the lack of robustness in an empirical study). A related and contentious issue in multidimensional wellbeing measurement is the weighting of the dimensions (Klugman, Rodríguez, & Choi, 2011), since it usually involves arbitrarily assigned dimension weights for aggregation purposes and attaching cardinal weight to something that does not have cardinal measure is equally problematic.

An important component of the societal wellbeing calculus is an accommodation of the negative effects of inequality in that society. There will always be variations or differences in health outcomes within a group of individuals, some are purely a matter of chance, others, a matter of personal choice (e.g. lifestyle) and others (like age, gender, location and genetics) are beyond individual control. It is the latter group of inequalities that need to be accommodated in an ethically based wellbeing measure (Fleurbaey & Schokkaert, 2009).

Here, in order to examine the impact of aging on wellbeing, age, along with gender and location are considered circumstances beyond individuals control which affect their ability to consume and achieve health status. In essence the issue is been couched in an equality of opportunity context. The designation of location as a circumstance beyond individual control is a departure from the usual

practice of considering it a matter of choice in the equal opportunity literature, and needs some defending. Location is a matter of choice, usually made early on in a persons' life, once made, it is not easily renounceable. The point is that some choices made at a given life stage are not easily revoked and become more like a circumstance the individual has to confront after that point in time, here urban/rural location is considered such a choice, made by the respondent prior to the survey and not easily reversed thereafter.

Multidimensional indices based upon the joint distribution of consumption and health which deal with the lack of cardinality in the SRH status variate (Anderson & Leo, 2020) are employed for comparing aggregate wellbeing across groups defined by gender, age and location. Then multilateral, multidimensional distributional comparison techniques (Anderson, Linton, Pittau, Whang, & Zelli, 2021) are employed to examine the extent to which there is equality of opportunity for wellbeing among those groups. An attraction of these techniques is that they do not require an arbitrarily specified weighting or aggregation scheme and, given a reasonable degree of discriminatory power, they are robust to such choices. These measures are then applied in a study of the health and consumption wellbeing relationship with respect to the aging process in twenty-first century China which examines the impact of Dibao, China's social assistance program (which was fully introduced in China in the first decade of the century). In the following, Section 2 discusses the development of the indices, some background to the Chinese situation and the data employed is developed in Section 3, Section 4 reports the empirical analysis and some conclusions are drawn in Section 5.

2. THEORETICAL BACKGROUND

Aging is a fact of life, a circumstance beyond individual control which, in influencing opportunities to be and do, affects wellbeing and raises questions as to the nature of the aging–wellbeing relationship and its concomitant inequities. Posed this way the questions require an analysis which compares and contrasts the wellbeing chances of different age groups, exploring the degree to which they can be ordered and examining the extent of their differences. The latter is really a question of whether or not there is equality of opportunity for wellbeing across age groups. At its simplest, the equal opportunity imperative seeks commonality between the outcome distributions of different groups organized by circumstance type. Very often this is examined through exploration of the relative differences of group means (Ferreira & Peragine, 2015, 2016, chapter 25) which, in the context of a treatment effects interpretation of group membership, explores relative differences in groups. However, this falls foul of a critique which argues that simple comparison of means masks other substantive distributional differences, casting a "veil of ignorance" over other important aspects of the analysis (Carneiro, Hansen, & Heckman 2003). Furthermore, as a test of more general distributional differences, difference in means tests could well prove to be inconsistent in having zero power even as the sample size grows without bound.

To illustrate the point, Fig. 1.1 records fictitious outcome probability density functions of an untreated and two treated groups, where treatments are designed to elevate outcome x. Group outcomes are normally distributed with a respective mean and variance of 0.5 and 0.01 for the untreated group and corresponding values for treated group 1 of 0.6 and 0.04 and 0.55 and 0.01 for treatment group 2. Given sufficiently large samples, simple difference in means tests would record significant improvement for both treated groups over the untreated group with treatment 1 being preferred to treatment 2 on that basis.

What such comparisons ignore is the fact that, in spite of being preferred over treatment 2, a portion of the treatment 1 group would suffer a deterioration in their outcome relative to being untreated (essentially 4.45% of the group[1]). Indeed 9.18% of group 2 would have suffered a decline in outcomes relative to having been given treatment 1. Note that no portion of the treatment 2 population suffers a deterioration in outcome relative to being untreated since, for every value of x, the area under the gray curve up to the value x is always less than or equal to that of the blue curve. Essentially treatment 1 carries a "small" downside risk of patient deterioration whereas treatment 2 does not, a risk that is not revealed or accounted for by simply comparing differences in means.

The problem lays in the different shapes of the outcome distributions and a lack of clarity as to what the desired shape of the outcome distribution of the treated groups should be. What is required is some notion of the properties of an outcome or wellbeing value function (OVF) which summarizes the value of the treatment outcomes to the treated population in aggregate. In its most general form, where the n members of the group are indexed $j = 1,.,n$, OVF may be written as

$$OVF = U\left(U_j\left(x_j\right), j = 1,.,n\right) \text{ with } \frac{\partial U}{\partial U_j} > 0 \text{ and } \frac{\partial U_j}{\partial x_j} > 0.$$

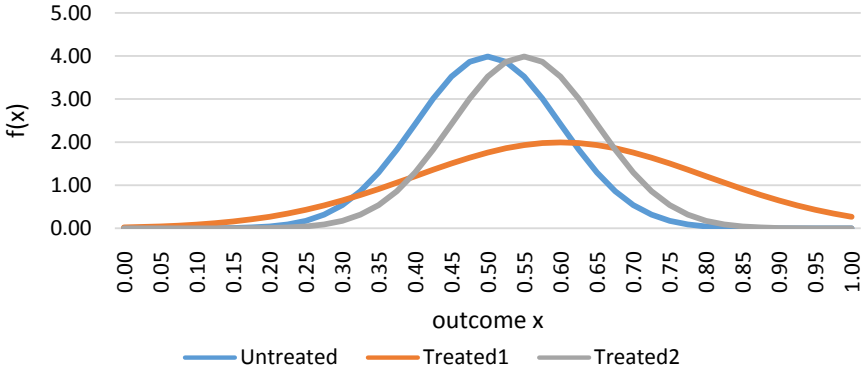

Fig. 1.1. Treatment Outcome Distributions.