World Records: Footnote 108 on pp. 72–4 marks nearly 3 full pages of fine print, containing some 30 quotes in that single footnote.)

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Moyes, P., Seidl, C., and Shorrocks, A. (Eds.): *Inequalities: Theory, Experiments and Applications.* Journal of Economics/Zeitschrift für Nationalökonomie, Supplement 9, XI, 363 pp. Springer, Wien New York, 2002. Softcover € 118.00.

The supplement to this journal contains thirteen contributions that were presented at the First Annual Meeting of *Living Standards, Inequality and Taxation* (LivinTaX), and a preface written by the editors of the issue Patrick Moyes, Christian Seidl and Tony Shorrocks. The conference, which took place in Bordeaux in January 2000, was organized to investigate distributional issues with particular focus on welfare, inequality, poverty, and taxation.

The present volume contains contributions on theoretical, experimental, statistical, and empirical issues. It is a useful collection for scholars who are interested in getting an idea of the recent developments of the literature. The most attractive feature of the book is the interaction between analytical methods and their practical applications.

The material is organized in three parts. The first part, *Inequality Measurement, Decomposition and Redistribution,* includes five theoretical oriented contributions, four of which investigate inequality comparisons or inequality reduction, and are related to the Lorenz ordering, while the remaining one is on the decomposition of inequality by income sources. The contributions of the second part, *Experimental Investigation of Distributional*

Issues, use questionnaire techniques in order to elicit people's attitudes with respect to a number of distributional issues concerning the perception of inequality and fairness in pure distribution problems, and in the taxation of households of different compositions. The last part, *Statistical Inference and Empirical Applications,* focuses on empirical analyses based on panel surveys and the design of statistical techniques in order to obtain robust conclusions.

It is intrinsically difficult to review a collection of papers tackling very different issues on the social evaluation of income distribution. The reader might find that we do not devote the same attention to different papers, but this is not at all an indication of the quality of the papers.

Before discussing the contributions of the authors, we wish to highlight the connections between the income inequality literature and other fields of economics: classical expected utility theory is linked to stochastic dominance; Yaari's theory generates classes of stochastic orderings termed inverse stochastic dominance; concepts from co-operative game theory are useful tools for inequality measurement.

In Yaari's theory attitudes toward risks are characterized by a distortion applied to probability distribution functions, in contrast to expected utility theory where attitudes toward risks are characterized by a utility function of income. A theory which combines the expected utility and distorted expected utility theory is the rank-dependent expected utility model, where a decision maker is characterized by a nonnegative utility function in conjunction with a distortion function. Even in the framework of inequality measurement such rank-dependent measures can be defined, and turn out to be useful tools when Lorenz curves intersect.

These connections are evident by looking at the papers of the first part. Four of them are related to the Lorenz ordering, and hence to stochastic dominance, while the remaining one discusses the decomposition of inequality by factor components using a new technique inspired by the Shapley value of co-operative games.

We find it instructive for reviewing the first part of the book to contrast direct and inverse stochastic dominance. The former is linked to the concept of welfare dominance according to utilitarian functions, while the latter is linked to welfare dominance in terms of the linear rank-dependent Yaari dual social welfare function. The two concepts are equivalent only up to the second order of dominance. From third order dominance on, the equivalence does not hold, and direct and inverse stochastic dominance highlight different aspects of inequality.

Zoli investigates the relationship between third degree inverse stochastic dominance and inequality dominance when Lorenz curves intersect. Inter-

section is the case in many practical situations, as shown by Shorrocks and Slottje, among many others, using data from 80 countries. When intersection occurs, it is always possible to find two relative inequality indices, consistent with the Lorenz ordering, that rank the distributions in opposite ways. Moving to third degree stochastic dominance, both direct and inverse, permits unambiguous ranking of distributions in this case. The class of indices coherent with third degree direct stochastic dominance is composed of the indices showing sensitivity to downward inequality, for example all members of the Atkinson family and of the Generalized Entropy family (with the value of the parameter being smaller than two). A notable exclusion is the Gini coefficient. On the other hand, the Gini coefficient, and more in general, the single parameter generalized Gini indices, are coherent with third degree inverse stochastic dominance.

The Lorenz criterion assumes that a transfer from richer (poorer) to poorer (richer), i.e., a progressive (regressive) transfer, reduces (increases) inequality. If Lorenz curves intersect, then neither distribution can be obtained from the other through a series of progressive or regressive transfers. In this situation a combination of both is needed. The characterization of third degree stochastic dominance is given through a finite sequence of progressive transfers and/or favorable composite transfers, where the latter is a combination of a progressive and a regressive transfer with the following properties:

(i) The progressive transfer occurs at lower income levels than the regressive transfer does.
(ii) The overall effect is to leave the variance unchanged.

For characterizing third inverse stochastic dominance a finite sequence of progressive transfers and/or favorable composite positional transfers is needed, which is a combination of a progressive transfer and a regressive transfer satisfying the following properties:

(i) The progressive transfer occurs at lower income levels than the regressive transfer does.
(ii) The overall effect is to leave the Gini index unchanged.

The interesting aspect of Zoli's paper is that in order to prove the equivalence between third inverse stochastic dominance and the sequence of progressive transfers and/or favorable composite positional transfers, he exploits the equivalence between third inverse stochastic dominance and welfare dominance, instead of investigating the effects of transfers directly.

Intersections of Lorenz curves also composes the bulk of Shorrocks and Slottje's paper, as mentioned above. The authors use data of 80 countries in order to examine the performance of quantile shares, of the Atkinson and the Generalized Entropy classes, of single parameter generalized Gini indices, and conclude that Lorenz dominance can be predicted with 99% accuracy using just 3 or 4 inequality measures, as long as two of them focus on the extreme upper and lower tails of the distribution.

Data sets usually provide lists of weighted observation, since weights are required to make the sample representative of the population of interest. Moyes and Ebert reformulate, in their paper, the notion of a progressive transfer incorporating the weights attached to the incomes of the donor and the recipient. They even pay attention to the transformations that preserve or convert a given quasi ordering into another quasi ordering. In general, the introduction of distinct weights complicates the analysis, but all the results derived in the traditional framework still hold.

The last two papers of the theoretical section, by Cubel and Lambert, and by Sastre and Trannoy, have direct implications for economic policy. The first paper examines how the acceptance of horizontal inequity can be second-best when government has limited amounts of information and must operate with a limited bundle of income tax parameters. The second paper applies the Shapley value allocation method in the income distribution framework. In particular, it shows how the Shapley value can be an appropriate inequality decomposition method by factor components, and it suggests some answers to common dilemmas faced when implementing this method.

The well-known Pigou-Dalton principle is the traditional principle of transfers. However, different notions of transfers model other important aspects of equalization. There is also empirical evidence that questions it. Bernasconi's paper uses a questionnaire technique and discovers a significant violation of the principle of transfers. This and other empirical studies suggest that weaker versions of the Pigou-Dalton principle of transfers should be considered. Several weak versions that restrict the class of admissible transfers are proposed in the literature. They are related to threshold incomes which separate classes of rich and poor. Bernasconi also found that several of the violations of expected utility in pure risk experiments, like the famous Allais paradox, reappear when one compares income distributions. Obviously, these violations ask for modification of the classical measures of welfare and disparity, which are based on utilitarianism, according to the generalized theory of choice under risk. An example of the latter are measures with weights attached to each household depending on their income.

The analysis carried out by Decoster and Schokkaert is based on data from a representative sample of the Flemish working population. An important component in the policy debate is, indeed, the attitude of different social groups toward income distribution and redistribution. Decoster and Schokkaert focus on the productive group to verify their concept of distributive justice. Inequality measures differ in the weight given to the information about the incomes attached to different positions. This paper shows that for many of the traditional empirical exercises, the choice of the inequality measure makes almost no difference. The ranking of individuals on the basis of their perceived and fair inequality is hardly affected. The results, as highlighted by the authors, might change if different social groups were to be considered.

The next two papers of the experimental investigation part (Traub's and Seidl's contributions) analyze the public's attitude toward income taxation, in conjunction with household composition, focusing on the German income tax schedule. Major inconsistencies with the standard economic theory of choice are found in both papers.

In the empirical part of the book, two papers (Trede and Van Kerm) investigate the usefulness of the bootstrap in order to make inference on inequality measures. In particular, both papers focus on common inequality measures that can be expressed as a function of weighted moments of the distribution. Bootstrap constitutes a valid alternative to the more classical analytical asymptotic approximations. These papers are in line with the huge statistical literature on the distribution of certain functionals (U-statistics, t-statistics, quantiles, etc.). The paper by Trede shows that the bootstrap method can be more reliable than the normal approximation in a small sample. Van Kerm, on the other hand, points out that in these methods the observations are assumed to be independent and identically distributed, while this is hardly the case in real data. According to Van Kerm, the asymptotic distribution of moment-based inequality measures with cluster data is easily determined. Results of a Monte Carlo experiment and an application to Belgian data show that neither basic bootstrap nor asymptotic approximations significantly outperform their competitors.

Longitudinal data are used in the last two papers (Devicienti and Van Kerm) for studying poverty persistence both in the UK and in Belgium. It is important to know whether poverty is a transitory status that a large proportion of individuals in the population experience at some time in their lifetime, or rather is a persistent curse that sticks to groups with particular socio-economic characteristics. For the UK Devicienti reports that in the 1990s only a tiny minority of individuals were poor for the whole period, while those touched by poverty at some time comprize a much higher

proportion of the population. The amount of low income turnover is relatively high. This, however, is not the case for Belgium from the end of the 1980s onwards. As Van Kerm highlights, the picture obtained crucially depends on the poverty threshold considered, with the turnover being much higher at the very bottom of the income distribution.

In conclusion, the book constitutes a good reference for researchers interested in linking theoretical and empirical aspects of inequalities.

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Gollier, C.: *The Economics of Risk and Time.* XX, 445 pp. MIT Press, Cambridge, Mass. 2001. Hardcover £ 34.50.

It is a quite pleasant task to write a review on Christian Gollier's book.

First of all because it is a delight to read it: Gollier yields a broad, clear and unifying perspective on macro-finance economics, with extremely deep and complete microeconomic foundations. Moreover he has a style. This book is not a standard manual gathering the current "state-of-the-art" under a mechanical pedagogical form, rather it is a genuine and original creation, which conveys a deep and rigorous vision of the economic questions at stake.

Second, it is a delight to review *The Economics of Risk and Time*, because the reviewer is in the comfortable situation of having to choose only among positive comments. Gollier's task was not easy: to write a graduate book on financial economics that remains within reach of practitioners, while going far beyond the simplistic mean-variance world. Gollier's compromise between realism and tractability is, in my opinion, perfect.

Further, I would like to discuss two assets of the book. First, on the coherence of its construction and the unified framework through which the arguments are developed. This goes far beyond the clean stylistic homogeneity, the sound modeling choices and the mastery in organizing the book. Coherence is conveyed though an integrated analysis, rooted on the most elementary and fundamental aspects of the expected utility model (e.g., its linear structure in the space of probabilities and the ubiquitous use of the *diffidence theorem*), and is always introduced through compelling intuitive illustrations. The integration of the analysis also underlines the clear links between various questions at stake (e.g., the isomorphism between the consumption/saving problem and the classic Arrow-Debreu portfolio choice problem of, respectively, chaps. 15 and 13).