

EDITORIAL OF THE SPECIAL ISSUE ON DISTRIBUTIONS AND INEQUALITY MEASURES IN ECONOMICS

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1. INTRODUCTION

The University of Milano-Bicocca (Department of Statistics and Quantitative Methods, Department of Economics and Statistics) and the Scientific Committee of the journal *Statistica & Applicazioni* organized the International Conference on Distributions and Inequality Measures in Economics, DIME 2020 (Milano, February 20-21, 2020).

The Scientific and Organizing Committee of the Conference suggested the following themes:

- Inequality (Concentration) Curves
- Inequality (Concentration) Measures
- Decomposition of Inequality (Concentration) Measures
- Distribution Models for Incomes Representations
- Empirical Analysis of Incomes Data
- Applications of Methodologies for Inequality Analysis.

A special session was also organized in memory of Paolo Radaelli, in the occurrence of the tenth anniversary of his departure.

The Journal *Statistica & Applicazioni* has received many papers (for publication) from the Authors of the oral contributions at the DIME 2020 Conference.

The present first issue dedicated to DIME 2020 is composed by the following six papers:

1. Agostino Tarsitano and Ilaria Amerise, Density-weighted quantile regression;
2. Barry Arnold, Flexible bivariate generalized Pareto model;
3. Elena Barcena-Martin and Jacques Silber, Deprivation, Satisfaction and Dual Expressions of Gini Related Measures of Inequality Mobility and Convergence;
4. Francesca De Battisti and Francesco Porro, Joint decomposition by sources and by subpopulations of the Zenga-84 inequality index;
5. Francesco Porro and Mariangela Zenga, The joint decomposition of the Pietra index;

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6. Michele Zenga and Igor Valli, Decomposition by subpopulations of Gini, Bonferroni and Zenga inequality measures.

2. DISCUSSION

The paper written by Agostino Tarsitano and Ilaria Amerise proposes a new weighted quantile regression method through the introduction of weights based on a recursive estimation of the sparsity function of the residuals. The new estimators are strictly related to the quantity quantile method introduced by Radaelli and Zenga in 2006. The new method has been applied to an empirical regression setting (Banca d'Italia, 2006) to demonstrate its usefulness in analysing household non-durable consumption expenditure.

The paper by Barry Arnold informs that the hierarchy of Pareto models described in Arnold (2015) admits representations in terms of independent gamma variables. Utilizing general Bivariate Beta (2) models introduced in Arnold and Ng (2011), which also involve independent gamma components, it is possible to identify flexible bivariate generalized Pareto models which can exhibit a wide range of correlation values. Multivariate extensions of the models are described. Simplified submodels of these are amenable to standard inference strategies.

The paper by Elena Barcena-Martin and Jaques Silber presents, first of all, many different ways of computing the synthetic Gini index. The paper also illustrates the dual ways of defining the Gini index and the possibility of expressing this index in terms of deprivation and satisfaction. These additional interpretations are then extended to the measurement of distributional change and convergence.

The paper by Francesca De Battisti and Francesco Porro provides the joint decomposition by subpopulations and sources of the Zenga-1984 inequality index based on the ratio between population quantiles and income quantiles. To show the usefulness of the described multi-decomposition, an application about the household consumption is provided. The real considered data set comes from the household consumption expenditure Survey (NCES) provided by ISTAT.

The paper by Francesco Porro and Mariangela Zenga obtains the additive decomposition: by k subpopulations, by c sources, and the $k \times c$ joint decomposition of the Pietra (1915) index. Beyond the methodological details, an application based on the Survey Household Income and Wealth 2018 (SHIW 2018) – carried out by Bank of Italy – is provided to clarify the advantages of the procedures.

The paper by Michele Zenga and Igor Valli discusses the results of decomposing the Bonferroni index, the Gini index and the Zenga (2007) index by using the two step approach to the decomposition of an inequality index by k subpopulations.

These decompositions decompose, first of all, the point measures in the sum of k terms, one for each subpopulation. In addition, each of these terms can be split into a within and a between component. In the second step these decompositions are extended to the corresponding synthetic measures. The decompositions obtained can be utilized in the case of non-overlapping subpopulations as well as in the overlapping case. The decompositions of three indexes are illustrated by a numerical example of a population of $N = 20$ units partitioned into $k = 5$ non overlapping subpopulations and by a numerical example of a population of $N = 7$ units partitioned into $k = 3$ overlapping subpopulations.

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REFERENCES

- Arnold B.C. (2015). *Pareto Distributions, 2nd edition*. Chapman and Hall/CRC, Boca Raton, FL.
- Arnold B.C., Ng H.K.T. (2011). Flexible bivariate beta distributions. *Journal of Multivariate Analysis*, **102**, 1194-1202.
- Banca d'Italia (2006). I bilanci delle famiglie italiane nell'anno 2004. *Supplementi al Bollettino Statistico*, Nuova serie, Anno XVI, Numero 7.
- Pietra G. (1915). Delle relazioni tra gli indici di variabilit. *Atti del Reale Istituto Veneto di Scienze, Lettere ed Arti*, **74**(2).
- Radaelli P., Zenga M. (2006). Linear regression for quantity quantiles. In *Atti della XLIII Riunione Scientifica della Societ Italiana di Statistica* (pp.605-608). Cleup, Padova,
- Zenga M. (2007). Inequality curve and inequality index based on the ratios between lower and upper means. *Statistica & Applicazioni*, **V**(1), 3-27.