From the Editor

CELEBRATING THE 80th BIRTHDAY OF PROFESSOR MICHELE ZENGA

Professor Michele Zenga, the member of the Scientific Committee of our Journal celebrates in the year his 80th Birthday, on this opportunity the whole Editorial Board along with the gratitude for a friendly and fruitful collaboration wishes you,

dear Professor ZENGA Happy Birthday!
And all the best, and may every wish you have come true!

Short biography of Professor Zenga

Professor Michele Zenga was born on July 1, 1939 in S. Agata in Puglia (province of Foggia). In Foggia he attended the elementary and secondary school. As an excellent student he was offered to work at Alfa Romeo. Concurrently with this work , he studied at the Faculty of Economics and Commerce (Economia e Commercio) at the Catholic University of Milan. After graduation in 1963, M. Zenga started to work at Milan Chamber of Commerce (Camera di Commercio di Milano). And again, without leving up his position at that Chamber, he continued the study in Rome. In 1967 he graduated at the University of Rome specializing in Demography and Actuarial Sciences.

Since 1975 Zenga was appointed as an extraordinary professor of Statistics, and in 1978 he received the title of ordinary professor Statistics in the Free Univesity of Trient. In 1992 Prof. M. Zenga moved to Milan. In the University Milano Bicocca he was the Dean of the Faculty of Economics, and established the Department of Quantitative Methods, of which he was the Director till 2009, when he retired.

Has published 20 original papers on inequality, five text books, about 20 papers on statistical inference and more than 20 works on various problems.

Basic achievements

The range of scientific interests of Professor Zenga is enormous. It covers virtually all statistical problems including classical topics, such as probability distributions, statistical inferences, both parametric and nonparametric. Professor Zenga is attributed very interesting original proposals concerning confidence interval for probability of multinomial variables, bivariate mean value for ordinal variables, quartile regression, and many other.

Below there are presented, very shortly, the most important achievements of Professor Michele Zenga which gave him the worldwide fame. Professor Michele Zenga's invention of inequality coefficients is so fundamental in statistics as it was of Corrado Gini.

The first significant publication concerning the index of inequality appeared in 1984. Since then the term ***l'indice di Zenga*** was becoming more and more popular around the world. This (first) index has the following form:

$$\boldsymbol{\zeta = \int_0^1 Z(p)dp}$$

where $Z(p)$ is the *Zenga curve*, which is defined as follows:

$$Z(p) = 1 - \frac{x_p}{x_p^*} = \frac{F^{-1}(p)}{G^{-1}(p)}$$

with usual definitions: $F(x) = \int_0^x f(t)dt$, $G(x) = \frac{1}{\mu}\int_0^x tf(t)dt$, standing for the cumulative proportion of the population with income x, and for cumulative share in total income. The inverses of these functions are called the quantiles of population, and of income respectively.

In 2007 Professor Zenga published the other important paper, in which it was presented the new measure, known also as **the Zenga index**. It causes certain confusion for some authors. Many scholars are not aware that these two indices are different.

New index has, formally, very similar form:

$$\boldsymbol{Z = \int_0^1 Z(p)dp}$$

but in this new case, the *Zenga curve* is defined differently:

$$Z(\alpha) = 1 - \frac{\begin{matrix} mean\ income \\ of\ the\ poorest\ 100\alpha\% \end{matrix}}{\begin{matrix} mean\ income \\ of\ the\ richest\ (1-\alpha)100\% \end{matrix}}.$$

More formally:

$$Z(\alpha) = 1 - \frac{\frac{1}{\alpha}\int_0^\alpha F^{-1}(s)ds}{\frac{1}{1-\alpha}\int_\alpha^1 F^{-1}(s)ds}, 0 < \alpha < 1.$$

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Adapting Kolms terminology, we can say that Zenga index belongs to the family of "rightist" indices, i.e. it satisfies the property:

$$Y = c \cdot X \Longrightarrow Z_Y(\alpha) = Z_X(\alpha),\ c > 0.$$

The properties of the curve $Z_Y(\alpha)$ when each individual income will be changed by the same quantity (negative or positive) are probably not investigated as to this day. Although the relation between $Z_Y(\alpha)$ and $Z_X(\alpha)$is known:

$$Y = X + c \ \Longrightarrow Z_Y(\alpha) = \left[1 + \frac{c(1-pZ_X(\alpha))}{\mu}\right]^{-1} Z_X(\alpha).$$

About the third significant invention is a new probability distribution, which is considered to be suitable to model wealth, financial, actuarial, and, especially, income distributions. The density for this distribution has a formidable form:

$$f(x;\mu,\alpha,\theta) = \int_0^1 v(x;\alpha,k)g(k;\alpha,\theta)dk$$

$$f(x;\mu,\alpha,\theta) = \begin{cases} \frac{1}{2\mu B(\alpha,\theta)}\left(\frac{x}{\mu}\right)^{-1.5} \int_0^{\frac{x}{\mu}} k^{\alpha-0.5}(1-k)^{\theta-2}dk, 0 < x < \mu \\ \frac{1}{2\mu B(\alpha,\theta)}\left(\frac{x}{\mu}\right)^{1.5} \int_0^{\frac{x}{\mu}} k^{\alpha-0.5}(1-k)^{\theta-2}dk, \mu < x \end{cases}.$$

Selected publications

Zenga M., Brunazzo A. (1981), *Sui maggioranti della distribuzione asintotica di un indice di concentrazione fra le classi di Gini*, Quaderni di Statistica e Matematica Applicata alle Scienze Economico-Sociali, vol. IV, no. 1-2, pp. 33-57.

Zenga M., Fedrizzi M. (1983), *The asymptotic distribution of the maximum absolute standardized frequencies of the multinomial distribution*, Metron, vol. XLI, no. 3-4, pp. 31-48.

Zenga M. (1984), *Proposta per un indice di concentrazione basato sui rapporti fra quantili di popolazione e quantili di reddito*, Giornale degli Economisti e Annali di Economia, no. 5-6, pp. 301-326.

Zenga M. (1985), *Un secondo indice di concentrazione basato sui rapporti fra quantili di reddito e quantili di popolazione*, Rivista di Statistica Applicata, vol. 18, no. 3, pp. 143-154.

Zenga M. (1989), *On a theorem by Kakwani*, Università degli Studi di Firenze, Quaderni del Dipartimento Statistico, no. 32, pp. 1-14.

Zenga M. (2001), *A multiplicative decomposition of Herfindahl concentration measure*, Metron, vol. 59, no. 1-2, pp. 3-10.

Zenga M., Zini A. (2001), *A modification of the right tail for heavy-tailed income distributions*, Metron, pp. 17-25.

Maffenini W., Zenga M. (2005), *Bipolar mean for ordinal variables*, Statistica & Applicazioni, vol. III, no. 1, pp. 1-16.

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Zenga M. (2007), *Inequality curve and inequality index based on the ratios between lower and upper arithmetic means*, Statistica & Applicazioni, pp. 1-38.

Radaelli P., Zenga M. (2008), *Quantity quantiles linear regression*, Statistical Methods & Applications, Springer, pp. 1-33.

Zenga M. (2010), *More on a new three-parameter distribution for non-negative variables*, Rapporto di, homes.stat.unipd.it, pp. 1-5.

Zenga M. (2010), *Mixture of Polisicchio's truncated Pareto distributions with beta weights*, Statistica & Applicazioni, vol. VIII, no. 1, pp. 3-25.

Zenga M., Pasquazzi L., Polisicchio M., Zenga M. (2011), *More on M.M. Zenga's new three-parameter distribution for non-negative variables*, Statistica & Applicazioni, vol. IX, no. 1, pp. 5-33.

Pasquazzi L., Zenga M. (2018), *Components of Gini, Bonferroni, and Zenga inequality indexes for EU income Data*, Journal of Official Statistics, 34(1), pp. 149-180.

Polskie Towarzystwo Statystyczne
Oddział we Wrocławiu

Zaprasza na seminarium naukowe pt.
INEQUALITY MEASUREMENT

Plan seminarium:

10:30 Prof. Michele Zenga (University of Milano-Bicocca, Italy)
Inequality Curve and Inequality Index Based on the Ratios Between Lower and Upper Means

11:15 Prof. Jacques Silber (Bar-Ilan University, Israel)
On the Generalization and Decomposition of the Bonferroni Index

12:15 Przerwa obiadowa

13:15 Prof. Michele Zenga (University of Milano-Bicocca, Italy)
Decomposition of Zenga's Inequality Index by Sources

14:15 Dyskusja

Seminarium odbędzie się w dniu 26 października br. w sali W3
(budynek Dolnośląskiego Centrum Informacji Naukowej i Ekonomicznej)