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How to Detect Linear Dependence on the Copula Level?

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Abstract

In many practical situations, the dependence between the quantities is linear or approximately linear. Knowing that the dependence is linear simplifies computations; so, is is desirable to detect linear dependencies. If we know the joint probability distribution, we can detect linear dependence by computing Pearson's correlation coefficient. In practice, we often have a copula instead of a full distribution; in this case, we face a problem of detecting linear dependence based on the copula. Also, distributions are often heavy-tailed, with infinite variances, in which case Pearson's formulas cannot be applied. In this paper, we show how to modify Pearson's formula so that it can be applied to copulas and to heavy-tailed distributions.

ABSTRACT

THE 7TH INTERNATIONAL CONFERENCE OF THE THAILAND ECONOMETRIC SOCIETY

(TES 2014)

'Modeling Dependence in Econometrics'

8th - 10th January, 2014

at Faculty of Economics,
Chiang Mai University
THAILAND

BANPU ptt Group

The Seventh International Conference of the Thailand Econometric Society

TES2014

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Organized by

The Thailand Econometric Society
Chiang Mai School of Economics
Department of Agricultural Economics, CMU
School of Economics and Public Policy, Srinakharinwirot University
School of Development Economics, National Institute of Development Administration
Department of Economics, Khon Kaen University
Faculty of Economics, Kasetsart University

8th – 10th January, 2014

At Chiang Mai School of Economics
Chiang Mai University, Chiang Mai, Thailand