



Universität  
Basel

## Research Project

### Statistical distributions and the moment problem

#### Project funded by own resources

**Project title** Statistical distributions and the moment problem

**Principal Investigator(s)** Kleiber, Christian ;

**Organisation / Research unit**

Departement Wirtschaftswissenschaften / Ökonometrie und Statistik (Kleiber)

**Project start** 01.10.2010

**Probable end** 31.12.2025

**Status** Active

The moment problem asks whether or not a given probability distribution is uniquely determined by its moments. The existence of moment-indeterminate distributions has been known since the late 19th century; however, first examples were often considered as mere mathematical curiosities. Recent research has shown that the problem is more widespread than previously thought and also that it is relevant in more practical contexts. Specifically, distributions that are not determined by their moments arise in applied economics, notably the modelling of economic size distributions, and also in mathematical finance. The project investigates determinacy issues for selected distributions from these fields. It will also consider the multivariate case, for which current knowledge is much more fragmentary than in the classical univariate setting.

The moment problem asks, for a given distribution with distribution function (d.f.)  $F$  with finite moments  $m_k(F) = E[X^k] = \int x^k F(dx)$ ,  $k = 1, 2, \dots$ , of all orders, whether or not  $F$  is uniquely determined by the sequence  $\{m_k(F), k \geq 1\}$ . For a given distribution with distribution function (d.f.)  $F$  with finite moments  $m_k(F) = E[X^k] = \int x^k F(dx)$ ,  $k = 1, 2, \dots$ , of all orders, whether or not  $F$  is uniquely determined by the sequence  $\{m_k(F), k \geq 1\}$ .

**Keywords** moment problem, statistical distributions

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#### Add publication

#### Published results

929269, Kleiber, Christian; Stoyanov, Jordan, Multivariate distributions and the moment problem, 0047-259X, Journal of multivariate analysis, Publication: JournalArticle (Originalarbeit in einer wissenschaftlichen Zeitschrift)

1473749, Kleiber, Christian, The generalized lognormal distribution and the Stieltjes moment problem, Publication: Discussion paper / Internet publication

1544544, Kleiber, Christian, On moment indeterminacy of the Benini income distribution, 0932-5026, Statistical Papers, Publication: JournalArticle (Originalarbeit in einer wissenschaftlichen Zeitschrift)

1544545, Kleiber, Christian, On moment indeterminacy of the Benini income distribution, Publication: Discussion paper / Internet publication

1473747, Kleiber, Christian, The generalized lognormal distribution and the Stieltjes moment problem, 0894-9840 ; 1572-9230, Journal of Theoretical Probability, Publication: JournalArticle (Originalarbeit in einer wissenschaftlichen Zeitschrift)

**Add documents**

**Specify cooperation partners**

ID	Kreditinhaber	Kooperationspartner	Institution	Laufzeit - von	Laufzeit - bis
462470	Kleiber, Chris- tian	Stoyanov, Jordan	Bulgarian Academy of Sci- ences	01.10.2010	31.12.2025