IDENTIFIABILITY OF MIXTURES OF POWER-SERIES DISTRIBUTIONS AND RELATED CHARACTERIZATIONS

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Abstract. The concept of the identifiability of mixtures of distributions is discussed and a sufficient condition for the identifiability of the mixture of a large class of discrete distributions, namely that of the power-series distributions, is given. Specifically, by using probabilistic arguments, an elementary and shorter proof of the Lüxmann-Ellinghaus's (1987, *Statist. Probab. Lett.*, **5**, 375–378) result is obtained. Moreover, it is shown that this result is a special case of a stronger result connected with the Stieltjes moment problem. Some recent observations due to Singh and Vasudeva (1984, *J. Indian Statist. Assoc.*, **22**, 93–96) and Johnson and Kotz (1989, *Ann. Inst. Statist. Math.*, **41**, 13–17) concerning characterizations based on conditional distributions are also revealed as special cases of this latter result. Exploiting the notion of the identifiability of power-series mixtures, characterizations based on regression functions (posterior expectations) are obtained. Finally, multivariate generalizations of the preceding results have also been addressed.

Key words and phrases: Univariate and multivariate power-series distributions, mixtures of distributions, the moment problem, infinite divisibility, posterior expectations.