

ASYMMETRICALLY TEMPERED STABLE DISTRIBUTIONS WITH  
APPLICATIONS TO FINANCE

A. Arefi  
R. Pourtaheri

*Abstract:* In this paper, we introduce a technique to produce a new family of tempered stable distributions. We call this family *asymmetrically tempered stable distributions*. We provide two examples of this family named asymmetrically classical modified tempered stable (ACMTS) and asymmetrically modified classical tempered stable (AMCTS) distributions. Since the tempered stable distributions are infinitely divisible, Lévy processes can be induced by the ACMTS and AMCTS distributions. The properties of these distributions will be discussed along with the advantages in applying them to financial modeling. Furthermore, we develop exponential Lévy models for them. To demonstrate the advantages of the exponential Lévy ACMTS and AMCTS models, we estimate parameters for the S&P 500 Index.

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