

A study of generalized normal distributions

Wen-Jang Huang¹ (黃文璋) and Nan-Cheng Su^{2*} (蘇南誠)

¹Department of Applied Mathematics, National University of Kaohsiung

²Department of Statistics, National Taipei University

Abstract

Recently, there are intense investigations about generalizing normal distributions. Among them, skew normal distributions and extended two-piece skew normal distributions are two classes of distributions, which both include standard normal distribution as special case. The later one is a class of skew distributions depending on two shape parameters. In this work, first some distributional properties of extended two-piece skew normal distributions will be presented. Next we revisit the special case, that is two-piece skew normal distributions. Then two distributions related to two-piece skew normal distributions will be studied. More precisely, we give some properties about generalized half normal distributions as well as a generalized Cauchy distribution. Finally, we discuss the distributions of linear combinations of two independent skew normal random variables.

Keywords: skew-normal, two-piece skew normal, half-normal, skew-Cauchy, uni/bimodal distribution