



University of
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A New Measure of Volatility of Volatility

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Abstract

Risk factors in stock markets are of great interest in investments. Baltussen *et al.* (2018) proposed that the uncertainty about risk also determines stock returns. They measured the uncertainty about risk of stocks as the volatility of implied volatility (vol of vol). The vol of vol has been proved to be a distinct risk characteristic of stocks, but not a significant risk factor. We propose a new measure of vol of vol. Our measure is quantified as the length of the confidence interval of the expected shortfall (LBCI). We show that the LBCI is a sensitive risk characteristic of stocks. The portfolio of stocks with the largest LBCI outperforms the portfolio of stocks with the smallest LBCI by 10.47% per year among 30 stock choices and by 47% per year among 501 stock choices. The portfolio of stocks with the largest LBCI has larger system risk, a larger abnormal return, and larger total volatility than the portfolio of stocks with the smallest LBCI. After running an asset pricing model with panel data, we find that the LBCI is a priced risk factor with statistical significance.

Keywords: Confidence interval, expected shortfall, bootstrap, APARCH, non-central student's t , CAPM, panel regression