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PhD Thesis Presentation

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Estimation of Leverage Effect

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ABSTRACT

The leverage effect has become an extensively studied phenomenon that describes the (usually) negative correlation between stock returns and volatility. All the previous studies have focused on the origin and properties of the leverage effect. Even though most studies of the leverage effect are based on cross-sectional calibration with parametric models, few of them have carefully studied its estimators. However, estimation of the leverage effect is important because sensible inference is possible only when the leverage effect is estimated reliably. In this thesis, we provide the first nonparametric estimation for a class of stochastic measures of the leverage effect. Unlike most previous work conducted over daily or longer return horizons, we seek to study the estimation of the leverage effect with high frequency data. In order to construct estimators with good statistical properties, we introduce a new stochastic the leverage effect parameter, which is usually not specified by other studies. The estimators and their statistical properties are studied in cases both with and without microstructure noise, under the stochastic volatility model. In asymptotics, the consistency and limiting distribution of the estimators are derived and corroborated by simulation results. For consistency, a previously unknown bias correction factor is added to the estimators. Infinite samples, we provide two modifications of the estimator to improve its performance. In addition, we explore several applications of the estimators. In one application, we apply the estimators in high frequency regression and discover a novel predictor of volatility that depends on an estimator of the leverage effect. A related study reveals the use of the leverage effect to improve estimation of volatility. In another application, we discover the first theoretical connection between skewness and the leverage effect, which further yields a new predictor of skewness.

Information about building access for persons with disabilities may be obtained in advance by calling Matt Johnston at 773.702-0541 or by email (mhj@galton.uchicago.edu).