



## Principal Component Analysis of High Frequency Data

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We develop a methodology to conduct principal component analysis of high frequency financial data. The procedure involves estimation of realized eigenvalues, realized eigenvectors, and realized principal components and we provide the asymptotic distribution of these estimators. Empirically, we study the components of the constituents of Dow Jones Industrial Average Index, in a high frequency version, with jumps, of the Fama-French analysis. Our findings show that, excluding jump variation, three Brownian factors explain between 50 and 60% of continuous variation of the stock returns. Their explanatory power varies over time. During crises, the first principal component becomes increasingly dominant, explaining up to 70% of the variation on its own, a clear sign of systemic risk.

**Keywords:** Principal components, high frequency, financial data, factor models.