A Factor Model for Cryptocurrency Returns[*]

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Abstract

We investigate the dynamics of daily realised returns and risk premiums for a large cross-section of cryptocurrency pairs through the lens of an Instrumented Principal Component Analysis (IPCA) (see Kelly et al., 2019). We show that a model with three latent factors and time-varying factor loadings significantly outperforms a benchmark model with observable risk factors: the total (predictive) R^2 from the IPCA is 17.2% (2.9%) for individual returns, against a benchmark 9.6% (-0.02%) obtained from a model with six observable risk factors explored in previous literature. By looking at the characteristics that significantly matter for the dynamics of risk premiums, we provide robust evidence that liquidity, size, reversal, and both market and downside risks represent the main driving factors behind expected returns. These results hold for both individual assets and characteristic-based portfolios, pre and post the Covid-19 outbreak, and for weekly individual and portfolio returns.

Keywords: Cryptocurrency markets, Instrumented PCA, asset pricing, factor models, risk premiums

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