

# Functional Capital Asset Pricing Model

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## Abstract

The capital asset pricing model (CAPM) is a well-celebrated model to capture a linear relationship between the daily returns of an asset and a market index. We extend this model to the high-frequency setting by proposing a functional CAPM. The functional CAPM is a stylized example of function-on-function linear regression. The bivariate functional regression coefficient measures a linear relationship between intraday cumulative returns of an asset and a market index. Using the Dow-Jones Industrial Average index and its constituent stocks, we investigate the goodness-of-fit of the functional CAPM for the intraday return of an asset.

## Keywords

Cumulative intraday returns, Dow-Jones Industrial Average index, Function-on-function linear regression, Regression coefficient function.