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Computational Investing, Part I

072: Capital Assets Pricing Model

Find out how modern electronic markets work, why stock prices change in the ways they do, and how computation can help our understanding of them. Learn to build algorithms and visualizations to inform investing practice.

Recap of CAPM

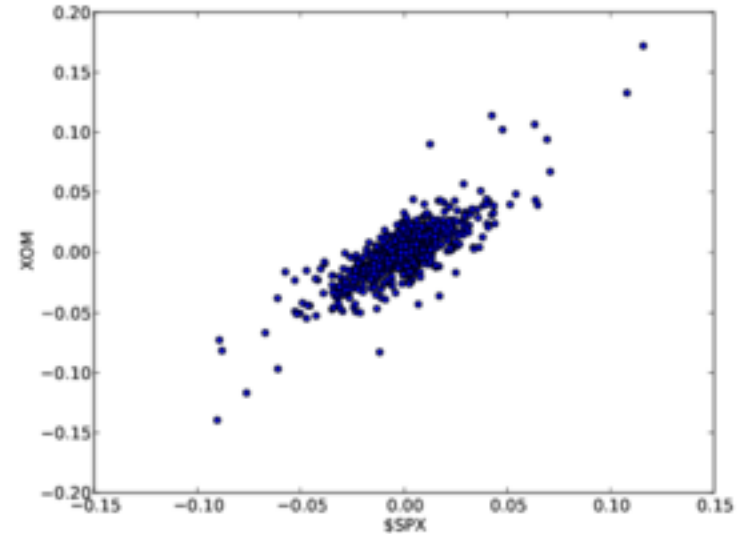
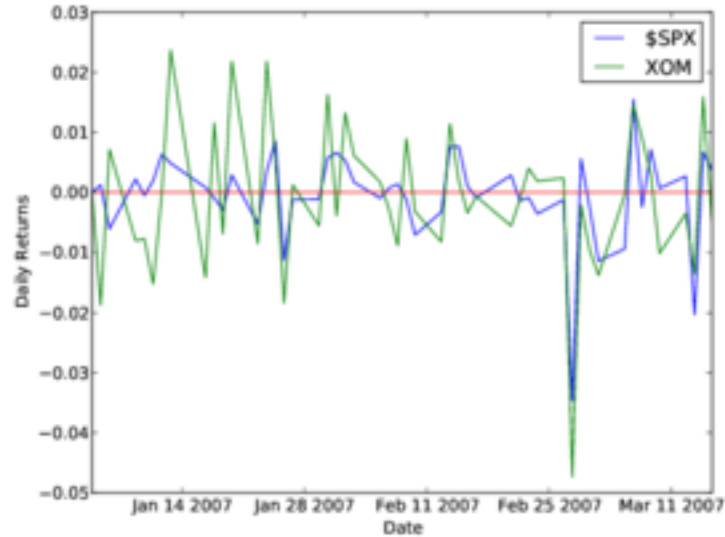
CAPM: Definition of Beta

- ⊙ Assume:

- $r_i(t) = \text{beta}_i * r_m(t) + \text{alpha}_i$

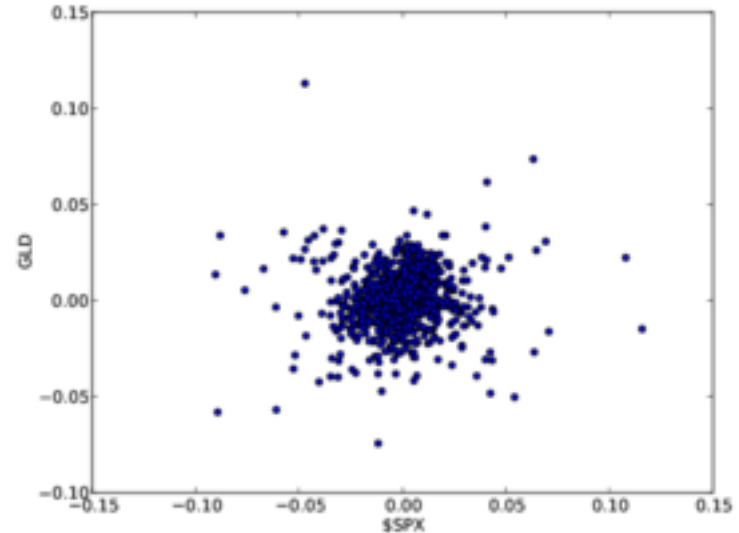
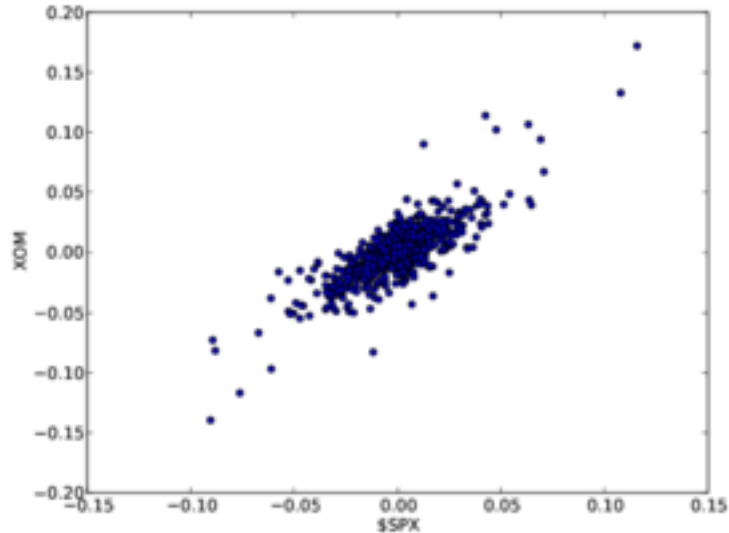
- ⊙ Use linear regression (line fitting) to find beta and alpha.

Beta & Correlation with the Market



Beta and Correlation are Different!

Beta & Correlation with Market



CAPM: Expected Residual = 0

⊙ CAPM:

- $r_i(t) = \text{beta}_i * r_m(t) + \text{alpha}_i$
- $r_i(t) = \text{beta}_i * r_m(t) + \text{random}$

⊙ Active Portfolio Management View

- $r_i(t) = \text{beta}_i * r_m(t) + \text{alpha}_i$

CAPM: Implications

- Expected excess returns are proportional to beta.
- Beta of a portfolio = weighted sum of betas of components.