Financial Anomalies

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2024-08-24

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Preface

The article is desiged to study financial anomalies

1 Introduction

Fama and MacBeth (1973) show two-parameter regression model estimates average risk-return relationships based on efficient market porfolio (m), that is, the market prices fully reflect the available information. The asset are constructed based on Equation ?? for an asset (i) proposed by @Black (1972).

$$x_{im} \equiv \frac{\text{total market value of all units of assets } i}{\text{total market value of all assets}}$$
 where $\text{asset}(i)$ in the $\text{portfolio}(m)$

Excepted return of a security (i) is $E(\tilde{R_0})$, the expected return on a security that is riskless in the portfolio m, plus a risk premium that is β_i times the difference between expected return of the portfolio $(E(\tilde{R_m}))$ and riskless portfolio $(E(\tilde{R_0}))$. is calculated by Equation $\ref{eq:condition}$, β_i is the risk of the asset i of the portfolio m, measured relative to $\sigma^2(\tilde{R_m})$

$$\begin{split} E(\tilde{R}_i) &= \left[E(\tilde{R_m}) - S_m \sum \tilde{R_m}\right] + S_m \sigma(\tilde{R_m}) \beta_i, \\ \text{where,} \\ \beta_i &\equiv \frac{cov(\tilde{R}_i, \tilde{R_m})}{\sigma^2(\tilde{R_m})} = \frac{\sigma_{j=1}^N x_{jm} \sigma_{ij}}{\sigma^2(\tilde{R_m})} = \frac{cov(\tilde{R}_i, \tilde{R_m})/\sigma(\tilde{R_m})}{\sigma(\tilde{R_m})} \\ S_m &= \frac{E(\tilde{R_m}) - E(\tilde{R_0})}{\sigma(\tilde{R_m})} \end{split}$$

hence

$$E(\tilde{R_i}) = E(\tilde{R_0}) + \left[E(\tilde{R_m}) - E(\tilde{R_0})\right]\beta_i \tag{1.2}$$

For each period of t, the cross sectional regression is given by

$$\begin{split} R_{pt} &= \tilde{\gamma}_{0t} + \tilde{\gamma}_{1t} \tilde{\beta}_{p,t-1} + \tilde{\gamma}_{2t} \tilde{\beta}_{p,t-1}^2 + \tilde{\gamma}_{3t} \bar{s}_{p,t-1} \tilde{\epsilon}_i + \tilde{\eta}_{pt}, \\ p &= 1, 2, ... t \end{split} \tag{1.3}$$