

# Financial Anomalies

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# Preface

The article is designed to study financial anomalies

# 1 Introduction

Fama and MacBeth (1973) show two-parameter regression model estimates average risk-return relationships based on efficient market portfolio ( $m$ ), that is, the market prices fully reflect the available information. The asset are constructed based on Equation 1 for an asset ( $i$ ) proposed by @Black (1972).

$$x_{im} \equiv \frac{\text{total market value of all units of assets } i}{\text{total market value of all assets}} \quad (1.1)$$

where asset( $i$ )in the 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  $\beta_i$  times the difference between expected return of the portfolio ( $E(\tilde{R}_m)$ ) and riskless portfolio ( $E(\tilde{R}_0)$ ). is calculated by Equation 1,  $\beta_i$  is the risk of the asset  $i$  of the portfolio  $m$ , measured relative to  $\sigma^2(\tilde{R}_m)$

$$E(\tilde{R}_i) = [E(\tilde{R}_m) - S_m \sum \tilde{R}_m] + S_m \sigma(\tilde{R}_m) \beta_i,$$

where,

$$\beta_i \equiv \frac{\text{cov}(\tilde{R}_i, \tilde{R}_m)}{\sigma^2(\tilde{R}_m)} = \frac{\sigma_{j=1}^N x_{jm} \sigma_{ij}}{\sigma^2(\tilde{R}_m)} = \frac{\text{cov}(\tilde{R}_i, \tilde{R}_m) / \sigma(\tilde{R}_m)}{\sigma(\tilde{R}_m)}$$

$$S_m = \frac{E(\tilde{R}_m) - E(\tilde{R}_0)}{\sigma(\tilde{R}_m)}$$

hence

$$E(\tilde{R}_i) = E(\tilde{R}_0) + [E(\tilde{R}_m) - E(\tilde{R}_0)] \beta_i \quad (1.2)$$

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

$$R_{pt} = \tilde{\gamma}_{0t} + \tilde{\gamma}_{1t} \tilde{\beta}_{p,t-1} + \tilde{\gamma}_{2t} \tilde{\beta}_{p,t-1}^2 + \tilde{\gamma}_{3t} \bar{s}_{p,t-1} \tilde{\epsilon}_i + \tilde{\eta}_{pt}, \quad (1.3)$$

$p = 1, 2, \dots, t$

Equation 1 the independent variable  $\tilde{\beta}_{p,t-1}$  is the average of the  $\tilde{\beta}_i$  for securities in portfolio  $p$ ,  $\tilde{\beta}_{p,t-1}^2$  is the average of the squared values of these  $\tilde{\beta}_i$ ,  $\bar{s}_{p,t-1}\tilde{\epsilon}_i$  is the average of  $s\tilde{\epsilon}_i$  for portfolio  $p_i$

Gupta and Ofer (1975) examines investors growth expectations reflected in the stock prices. A change in the expectation is reflected in the price movement. The study defines the earnings price ratio is a function of risk characteristics of the security and the expected growth in the earnings in Equation 1. The risk component are measured by: - the beta coefficient - the firm asset size (natural logarithm of total asset) - dividend payout ratio - leverage ratio of liabilities and preferred stocks to the common stock outstanding - earnings variability (standard deviation of earnings to price ratio calculated over period of seven years)

$$EP = f(RS, EG) \quad (1.4)$$

where:

$EP$  = earnings price ratio- ,

$RS$  = risk characteristics of the security

$EG$  = the expected growth rate in the earnings

$$(1.5)$$

$$\Delta P_i^t = \frac{P_{it} - P_{it-1}}{P_{it-1}} \times 100 \quad (1.6)$$

where:

$\Delta P_i^t$  is the percent change of the security  $i$  during the period  $t - 1$  to  $t$

The average yearly percentage of the prices change for portfolio  $j$  ( $\Delta P_j$ ) is given by

$$\Delta P_j = \frac{\sum_{t=1}^{14} \frac{\sum_{r_t=10j-9}^{10j} \Delta P_{rt}^t}{14}}{14}, r_t = 1, \dots, 190$$

where:

$r_t$  = the relative ranking of a security at time  $t$  according to its prediction error at that year. (1.7)

$\Delta P_t^{rt}$  = percentage price change during the period  $t - 1$  to  $t$  for a security that has the rank of  $r_t$  at time  $t$  (1.8)

Basu (1977): to determine empirically whether the investment performance of the common stocks is related to the  $P/E$  ratios.  $P/E$  is the ratio of market value of the common stock

(market price times the number of shares outstanding) as of December 31 to reporting annual earnings (before extraordinary items) available for common stockholders. According to the paper, due the exaggerated investor expectations,  $P/E$  ratio may be the indicator of future investment performance. The paper shows that  $P/E$  is not fully reflected in security prices in as rapid a manner as postulated by the semi-strong form of the efficient market hypothesis. Instead, it seems that disequilibrium persisted in the capital market during the period studied. The results suggests that market efficiency does not exist due to lags and frictions in the price adjustment process.

Litzenberger and Ramaswamy (1979):

## 2 Summary

In summary, this book has no content whatsoever.

## References

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