Financial Anomalies

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Table of contents

Preface	**3**
1 Introduction	**4**
2 Summary	**7**
References	**8**

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 1 for an asset (i) proposed by @Black (1972).

$$
\begin{aligned}
&x_{im} \equiv \frac{\text{total market value of all units of assets } i}{\text{total market value of all assets}} \\
&\text{where asset}(i)\text{in the portfolio}(m)
\end{aligned}
\tag{1.1}
$$

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 1, β_i is the risk of the asset i of the portfolio m, measured relative to $\sigma^2(\tilde{R_m})$

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

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

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

Equation 1 the indepenent variable $\tilde{\beta}_{p,t-1}$ is the average of the $\tilde{\beta}_i$ for securities in portfolio p, $\tilde{\beta}^2_{p,t-1}$ 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 liabilties and preferred stocks to the common stock outstanding - earnings variablity (standard deviation of earnings to price ratio calcuated over period of seven years)

$$EP = f(RS, EG) \tag{1.4}$$

where:

$EP =$ earnings price ratio- ,

$RS =$ risk characteristics of the security

$EG =$ the expected growth rate in the earnings

$$\tag{1.5}$$

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

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

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

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 peroformance. 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 adjustmnet process.

Litzenberger and Ramaswamy (1979):

$$\tilde{R} - r_{ft} = \gamma_0 + \gamma_1\beta_{it} + \gamma_2(d_{it} - r_{ft}) + \tilde{\epsilon}_{it}, i = 1, 2, \cdots, N, t = 1, 2, \cdots, T \tag{1.9}$$

where :

$\tilde{R}_{it}$Return of the security i in period t, β_{it} and d_{it} are the systemic risk and the dividend yield of security i in

$\tilde{\epsilon}_{it}, adisturbancetermis\tilde{R} - E(\tilde{R}_{it}), thedeviationoftherealizedreturnfromtheexpectedvalue.$

coeffiecients $\gamma_0, \gamma_1, \gamma_2$ (1.10)

Banz (1981): studies "size effect" by using market indices - Market Index, CRSP value weighted, CRSP equal weighted indexes, US Bond Index, Corporate Bond Index to estimate the relationship between the return and market value.

$$R_{it} = \gamma_{0t} + \gamma_{1t}\beta_{1t} + \gamma_{2t}\left[(\phi_{1t} - \phi_{mt})\right] + \epsilon_{it}, i = 1, \cdots, N \tag{1.11}$$

where:

R_i = return on security i

γ_0 = return on a zero-beta portfolio

γ_1 = return on market risk premium

ϕ_i = market value security i

ϕ_m = average market value

$\gamma_2$constant measuring the contribution of$\phi_i$to the expected return of a security

(1.12)

2 Summary

In summary, this book has no content whatsoever.

References

Banz, Rolf W. 1981. "The Relationship Between Return and Market Value of Common Stocks." *Journal of Financial Economics* 9 (1): 3–18.

Basu, Sanjoy. 1977. "Investment Performance of Common Stocks in Relation to Their Price-Earnings Ratios: A Test of the Efficient Market Hypothesis." *The Journal of Finance* 32 (3): 663–82.

Black, Fischer. 1972. "Capital Market Equilibrium with Restricted Borrowing." *The Journal of Business* 45 (3): 444–55.

Fama, Eugene F, and James D MacBeth. 1973. "Risk, Return, and Equilibrium: Empirical Tests." *Journal of Political Economy* 81 (3): 607–36.

Gupta, Manak C, and Aharon R Ofer. 1975. "INVESTORS'EXPECTATIONS OF EARNINGS GROWTH, THEIR ACCURACY AND EFFECTS ON THE STRUCTURE OF REALIZED RATES OF RETURN." *The Journal of Finance* 30 (2): 509–23.

Litzenberger, Robert H, and Krishna Ramaswamy. 1979. "The Effect of Personal Taxes and Dividends on Capital Asset Prices: Theory and Empirical Evidence." *Journal of Financial Economics* 7 (2): 163–95.