CHAPTER 6

AN EMPIRICAL INVESTIGATION OF THE PROFITABILITY ANOMALY IN THE INDIAN STOCK MARKET

6.1 INTRODUCTION

Asset pricing anomalies primarily momentum, accruals and net stock issues have been heavily researched for the developed capital markets. It is the profitability anomaly which is comparatively less explored. Haugen and Baker (1996) and Cohen, Gompers and Vuolteenaho (2002) find more profitable firms have greater expected returns. Fama and French (2006) conclude that given BM and expected investment, higher expected profitability implies higher expected returns. Fama and French (2008) report that the profitability anomaly exits only in the case of small stocks. In this case they find a positive relation between profitability and returns and presence of significant hedge returns although the hedge portfolio returns are nonexistent in the case of big stocks, tiny stocks and market as a whole. Fitzpatrick and Ogden (2009) find that the lowest future returns are associated with the lowest profit quintile and vice versa. Artmann, Finter and Kempf (2011) find average returns increase as one moves from low profitability portfolios to high profitability portfolios.

A possible explanation for the positive relation obtained by the above studies could be that they visualize profits as the reward for growth and innovation, which exposes entrepreneurs to greater risk thus resulting in higher returns. This explanation is justified if relationship between returns and profitability and returns is examined from the firm’s point of view. The firm might have borne higher operating or financial risk in managing its operations and profits could be regarded as the reward for risk bearing. Nevertheless the entire analysis of stock market anomalies has to be carried out from the perspective of the investor who is in pursuit of trading strategies which can generate positive alphas. This study thus purports to explain the existence of the profitability anomaly from the latter’s point of view as follows. If a firm is relatively more profitable then investors perceive it to be relatively less risky and are hence are
willing to accept low returns. This would be a counter argument to the existing explanation of profits as compensation for bearing higher risks.

To elucidate this point the study hypothesizes that risk (measured by beta) and share values are linked to payouts in form of dividends. Corporate profits earned by firms may be either retained and reinvested by the firm or paid out to shareholders as dividends. According to Amidu and Abor (2006) “Profits have been regarded as the primary indicator of a firm’s capacity to pay dividends”. Pruitt and Gitman (1991) show that current and past year’s profits are important in influencing dividends payments. Yiadom and Agyei (2011) show significant positive association between dividend policy and profitability. Aivazian, Booth and Cleary (2003) find that for emerging markets (including India) high profits tend to mean high dividend payments. Given that higher profitable firms pay higher dividends the influence of corporate dividend policies on stock prices is next explored. The bird in the hand theory (Gordon, 1963) argues that investors prefer a dividend today to a highly uncertain capital gain from future investments tomorrow. Hence investors value high payout firms more highly. Shefrin and Statman (1984) develop a behavioral theory in which they show that investors want dividends because of self control and due to choices made under uncertainty. Their theory suggests that some investors would be willing to pay a premium for dividends due to self control reasons or wish to avoid regret. Investors finance consumption out of dividends and do not want to dip into capital. Also there is empirical evidence to support the signaling function of dividends. Since managers have more information about the health of the company, dividend increases signal a healthy growing firm. An increase in dividend payout may be interpreted as the firm having good future profitability and therefore its share news will react positively. Asqiuth and Mullins (1983) find that the initiation of dividend has significant positive impact on the firm’s stock price. The positive relation between dividend policy and stock prices was also shown by John and Williams (1985). Consequently if a more profitable firm pays a higher dividend, investors would buy that stock and drive its price high.
Dividend payouts\(^1\) not only enhance firm values owing to their information content but if investors perceive high dividend paying companies as less risky it will also result in lower cost of equity/required returns. This will positively impact firm values as one can see from the valuation equation

\[
V = \frac{\bar{X}}{k}
\]

(6.1)

where \(\bar{X}\) is the expected stream of dividends/cash flows to infinity, \(k\) is the cost of equity required returns of investors and \(V\) is the equity value.

That investors perceive high dividend paying companies as less risky is reconfirmed by evidence in the literature on relationship between dividend payments and market beta. Several studies have explored the relationship of dividends payouts with market beta. Logue and Merville (1972) document that investors are assured of the flow of returns from dividend payouts than the flow of returns obtained from higher stock prices. This leads to the inverse relationship between payouts and beta. Beaver, Kettler and Scholes (1970) assert that ceteris paribus firms with lower payout ratios are more risky. This is because payout ratio shows the management’s perception of uncertainty with respect to firm’s earnings. Breen and Lerner (1973) and Gu and Kim (2002) purport an inverse relationship between systematic risk and high dividend payout. This would mean that lower (higher) dividend paying firms are more(less) risky and hence investors demand a higher (lower) premium. Thus there is a counter argument which states that high profitable firms pay higher dividends which are viewed as less risky by the investors and hence they are willing to accept lower returns.

This chapter has been motivated by the following research gaps. Firstly a study of the profitability anomaly in the Indian stock market thus far has not been conducted. Secondly the anomaly for the mature markets has been analysed from the point of view of the firm and not the investor. To fill this void in the literature the study examines the profitability anomaly in the Indian stock market, investigates the reasons for its existence and explores possible explanations. This chapter specifically examines the following propositions.
• What is the relationship between firm profitability and stock returns?

• Do more profitable firms pay higher dividends?

• Can profitability anomaly be explained by CAPM based market factor and therefore does the slope of the market factor bear a relation with dividend payouts?

• Can the Fama French multi factor model explain returns that are possibly missed by CAPM?

• Are there any links between Fama French size and value factors and firm payouts?

The objectives of the study are

• Is the profitability anomaly in returns empirically validated in Indian context?

• Does the relationship between profitability and returns reflect firm or investor perspective?

• Can the profitability anomaly be captured by standard asset pricing models such as CAPM and Fama French?

• Do the risk factors bear a fundamental relation with corporate payouts?

The chapter is organised as follows. Section 6.2 describes the data and their sources. Section 6.3 explains the methodology followed. Section 6.4 gives the empirical results. The last section contains summary and concluding remarks.

6.2 DATA

The sample used consists of 493 companies that form part of BSE-500 equity index. The study uses month end closing adjusted share prices (adjusted for capitalisation such as bonus, rights and stock splits) from Jan 1996 to Dec 2010 (180 monthly observations). BSE-500 index represents nearly 93% of the total market capitalization
on BSE, accounts for 95% of trading activity, and covers all 20 major industries of the economy. Hence the sample is fairly representative of market performance. The Bombay Stock Exchange (BSE) -200 index is used as the market proxy. It is a broad based value weighted index which is constructed on the lines of S&P500 (USA). The month end share price series have been converted into percentage return series for further estimation.

Market capitalisation is used as the size proxy. It is calculated as the natural log of price times shares outstanding. Price to book (inverse of BE/ME) is used as the value proxy. Price to book value per share represents the security price over a company’s book value. The study uses two alternative measures for profits viz return on equity and return on assets. Return on equity is calculated as the income available to common stockholders divided by the common equity. Return on assets is calculated as net income scaled by average total assets.

Data on share prices, market index all company characteristics has been obtained from the Thomson One database of Thomson Reuters. The firm’s dividend payout ratio has been used to represent the dividend decision. Dividends payout ratio is calculated as equity dividend that is paid to equity share owners as a percentage of total profit after tax. Data on this has been obtained from CMIE-Prowess. The implicit yields on 91-day treasury bills have been used as risk-free proxy as is the standard practice in finance literature. The data for this has been obtained from the RBI monthly handbook of statistics.

6.3 METHODOLOGY

6.3.1 Test the Relationship between Profitability and Returns

Single sorted portfolios based on each measure of profitability are formed. In December of year t-1, the securities are ranked on the basis of the profitability definition under consideration. The ranked securities are then classified into five portfolios P1 to P5 and equally-weighted monthly excess returns are estimated for these portfolios for the next 12 months (t). P1 is the portfolio consisting of 20% of companies with lowest attribute while P5 consists of top 20% companies with highest
attribute under consideration. P1 and P5 are referred henceforth as corner portfolios in the study. The portfolios are re-balanced at the end of December of year t. A year is defined as calendar year from January to December. Sample securities are sorted in December of each year beginning in December 1995 and portfolio formation process repeated till December 2009.

In the first step of the methodology the unadjusted mean excess returns across the portfolios created are observed, and the relationship between profitability and returns is ascertained.

6.3.2 Test the Relationship between Profitability and Payouts

To estimate relationship between dividend payouts and profitability a panel OLS regression is estimated where the dividend payout is the dependent variable and the explanatory variable is profits. The following equation is estimated

\[ \text{Payout}_{i,t} = \lambda_0 + \lambda_1 \text{profits}_{i,t} + \epsilon_t \]  

(6.2)

where \(\lambda_0\) is a constant. A significant positive value of \(\lambda_1\) would indicate that more profitable firms pay higher dividends and vice versa. To confirm these results the study constructed profitability sorted portfolios and calculated the average payout ratios of the corner portfolios.

6.3.3 Asset Pricing Test - CAPM

CAPM regressions are run on each of the five portfolios using the familiar “excess return” version of the market model equation.

\[ R_{pt} - R_{ft} = a + b (R_{mt} - R_{ft}) + \epsilon_t \]  

(6.3)

where \(R_{pt} - R_{ft}\) is the monthly excess return on the portfolio i.e. return on portfolio P minus risk free return \(R_{ft}\).

\(R_{mt} - R_{ft}\) is the excess market return i.e return on market factor minus risk free return,

\(\epsilon_t\) is the error term,
a (intercept) is a measure of abnormal profits and

b is the sensitivity coefficient of market factor.

The CAPM implies that excess returns on a portfolio should be fully explained by excess market returns. Hence, the expected value of a (the intercept term) should be 0. A significantly positive (negative) value of ‘a’ (intercept) implies extra-normal profits (losses). If there is a significant positive or negative intercept in the CAPM specification, then a CAPM anomaly exists.

6.3.4 Test the Relationship between Beta and Payouts

The purpose of estimating the relation between beta and payouts is to evaluate if high payout firms are perceived to be less risky by investors. This involves first estimating stock beta for each individual firm by regressing a firm’s excess monthly stock return against the excess market return. The variable beta measures the co movement of security return with the market return and is called the systematic risk of the equity security of firm i. The value of $\beta_i$ is obtained from the following time series regression for each firm $i$ in the sample as follows

$$Y_i = \alpha + \beta_i X$$

(6.4)

where $Y_i$ is the excess monthly return of a firm $i$,

$X$ is the excess market return,

$\alpha$ the intercept and $\beta_i$ (beta) is the stock beta for firm $i$.

Once the value of beta is available for each firm over the entire sample period, the relation between beta and payouts is estimated using panel OLS in the following equation

$$\text{beta}_{i,t} = \gamma_0 + \gamma_1 \text{payouts}_{i,t} + \epsilon_{i,t}$$

(6.5)

where beta is the estimated yearly beta from equation 6.4 and $\gamma_0$ is the intercept. The value of $\gamma_1$ in this equation shows the relationship between beta and payouts.
6.3.5 Asset Pricing Test-Fama French (FF) Model

If a CAPM anomaly exists then it is evaluated if the excess returns of the stylized portfolios that are missed by CAPM can be explained using the three factor model of Fama and French (1993) specified as follows.

The FF Model is given by:

\[ R_{pt} - R_{ft} = a + b (R_{mt} - R_{ft}) + s(SMB_t) + h(LMH_t) + e_t \]  \hspace{1cm} (6.6)

where SMB\(_t\) is the monthly return on the size mimicking portfolio,

LMH\(_t\) is the monthly return on the price-to-book mimicking portfolio,

s and h are the sensitivity coefficients of SMB\(_t\) and LMH\(_t\)

The other two terms are same as defined in equation (6.3).

SMB and LMH are estimated as follows. In each year of the sample period t-1, the stocks are split into two groups- big (B) and small (S) - based on whether their market capitalization at the end of December of every year in the sample period is above or below the median for the stocks of the companies included. The price to book equity ratio is calculated in this month for all the companies. The stocks are now split into two equal P/B groups. Then four portfolios viz. S/L, S/H, B/L, B/H are constructed from the intersection of the two size and two P/B groups. Monthly equally weighted return series are calculated for all portfolios from Jan of year t to December of year t.

The Fama and French model uses three explanatory variables for explaining the cross section of stock returns\(^2\). The first factor is the excess market return which is the market index return minus the risk-free return. The second is the risk factor in returns relating to size – small minus big (SMB). To calculate the monthly return of the SMB factor the simple average of the monthly returns of the two big size portfolios (B/L, B/H) is subtracted from the average of the two small size portfolios (S/L, S/H) as this factor has about the same weighted-average price to book it is free from value effects.

\[ SMB = (S/L + S/H)/2 - (B/L + B/H)/2 \]  \hspace{1cm} (6.7)
The third factor is $LMH$, which is related to value. It is constructed as follows such that it is independent of size factor.

$$LMH = (S/L + B/L)/2 - (S/H + B/H)/2 \quad (6.8)$$

If the intercepts from the FF regressions are insignificant and the intercepts from the CAPM regressions are significant, then this implies that the FF specification is able to capture cross sectional patterns in average stock returns that are missed by CAPM. Greater sensitivity of sample portfolio returns to the size and value risk factors is shown by higher factor loadings i.e. $s$ and $h$ for these factors. It is then verified if the corner portfolios (P1 and P5) comprise of stocks with particular attributes i.e. small (big) size, low (high) P/B ratio. Such stock characteristic patterns in the sample portfolios shall support the strong performance if any of the FF model.

### 6.3.6 Test the relationship between dividend payouts, size and value factors

The study next evaluates if FF size and value factors have their tracks in firm payout ratios i.e. do small and low P/B firms tend to pay lower dividends and hence are perceived by investors to be more risky vis-a-vis big and high P/B firms. To estimate the relationship of size and value factors with dividend payouts respectively two panel OLS equations are estimated as follows

$$Size_{i,t} = \gamma_0 + \gamma_1 \text{payouts}_{i,t} + \epsilon_{i,t} \quad (6.9)$$

$$P/B_{i,t} = \gamma_3 + \gamma_4 \text{payouts}_{i,t} + \epsilon_{i,t} \quad (6.10)$$

where $\gamma_0$ and $\gamma_3$ are intercepts and $\gamma_1$ and $\gamma_4$ would indicate the relationship of size and value factors with dividends if any. To confirm these results, portfolios are constructed based on size, P/B and the average values of dividend payouts for corner portfolios are obtained.
6.4 EMPIRICAL RESULTS

The relationship between profitability and unadjusted returns is shown in Table 6.1. Results show that the unadjusted returns on ROE sorted portfolios are larger for less profitable stocks as compared to more profitable stocks. The return differential between less profitable and more profitable stocks is approximately 1% per month (t-stat=2.01) which is about 12% p.a. and hence is robust. Panel b shows that sorting on ROA the average returns are again significantly higher for low profitability stocks as compared to that of high profitability stocks. The lowest profitability portfolio produces an abnormal return of 2.6 % per month whereas the highest profitability portfolio produces an abnormal return of 1.5 % per month. Thus a negative relation between profitability and returns is established which is in contrast to the results obtained for mature markets.

Is it possible that the Indian investor finds high profitable stocks to be less risky due to which he is willing to accept lower returns? To answer this question the study explores the information contained in profits which could contribute to the risk argument. The study visualises one risk factor which could be linked to dividend payouts. Hence the relation between profitability and payouts is next estimated.

Results of panel OLS regression\(^3\) (Table 6.2) show that firm with larger profits (both ROE and ROA) are more likely to pay higher dividends while companies that have comparatively lower profits would adopt lower payouts. The results appear to be consistent with the findings of other empirical studies (Baker, Farrelly & Edelman, 1985; Pruitt & Gitman, 1991). The average values of dividend payouts calculated for corner portfolios sorted on profitability (both ROE and ROA) strengthen these results. Results show that average dividend payouts for low ROE (ROA) sorted portfolio is 20.12% (18.01%) and for high ROE (ROA) sorted portfolio is 29.67% (31.14%). Corporate dividend policy tends to vary directly with current profits. Current profits may contain information about future profits and hence large payouts may send a positive signal leading to stock price appreciation.
CAPM results (Table 6.3) show that the extra normal returns (after adjusting for market risk) on ROE sorted portfolios is 1.2% per month for less profitable stocks and 0.6% per month for more profitable stocks. The significant intercepts of corner portfolios confirm the presence of a profitability anomaly within the CAPM framework. However it is observed that the market beta for less profitable stocks (P1) is higher as compared to more profitable stocks (P5), showing that less profitable firms are more risky. The beta coefficient of both portfolios is also statistically significant which means that the market return factor is important in capturing a large amount of variation in common stock returns. It is seen that the alphas of P1 and P5 have sobered down due to the contribution of beta. Results on ROA sorted portfolios are in line with that obtained for ROE. The extra normal return (after adjusting for market risk) is 1.4% per month for less profitable stocks and 0.4% per month for more profitable stocks. The intercept of the lower profitability portfolio (P1) is statistically significant confirming the presence of a profitability anomaly within the CAPM framework. The results reconfirm that market factor is able to explain part of the profitability anomaly.

These results are in line with Logue and Merville (1972) who find negative relation between profitability and beta. They reason that investors perceive profitability as an “inverse surrogate” of business risk. Previous findings of Scherrer and Mathison (1996), Gu and Kim (2002) and Lee and Jang (2006) indicate a negative relationship between profitability and systematic risk. From an investors perspective who is developing a trading strategy a highly profitable firm is less risky and hence should provide less returns.

The results of panel OLS\(^4\) show that market beta is significantly negatively related to dividend payouts (Table 6.4). Firms with high payouts (profitability) are perceived to be less risky investments while firms with persistently low payouts (profitability) are perceived to be more risky. This is expected as firms which are less profitable and hence do not have adequate funds resulting in low/no dividends are typically more risky (higher beta). It is seen that since beta shows a negative link with payouts, it absorbs a portion of returns in CAPM.
The FF results (Table 6.5) show insignificant intercepts for lowest profitability portfolios (both ROE and ROA) owing to contribution of both size and value factors. FF regressions show that both SMB and LMH coefficients are higher for P1 as compared to P5 confirming role of size and value factors in explaining profitability based returns. Hence the three factor model absorbs the profitability sorted returns that are missed by CAPM. Further FF results are robust to choice of profitability proxy i.e. ROE and ROA.

When the average size and P/B for the profitability sorted portfolios (both ROE and ROA) are investigated, it is found that P1 is actually small size and low P/B vis-a-vis P5 i.e. less profitable firms are relatively distressed and smaller in size (for use of P/B as a measure of relative distress see Chan & Chen, 1991). Since less profitable firms are relatively distressed and small in size, it is found that small sized companies and low P/B companies give lower dividend payouts and hence are perceived to be more risky by investors.

Next the study tries to develop a risk story for size and value factors. The panel OLS results (Table 6.6) show weak positive relationship between firm size and payouts and a weak positive relationship between P/B and payouts. Examining the corner portfolios formed on the basis of size and P/B it is observed that small and low P/B firms do exhibit lower payouts vis-a-vis big and high P/B firms (average payouts for small firms is 19.17% and for big firms is 30.15%. Average payouts for low P/B firms is 20.26% and for high P/B firms is 30.64%). However in the absence of any statistically significant relationship one might infer that there could be other reasons for the risk story leading to these factors for instance small firms are exposed to high operational, financial risks owing to the nature of their business and more liquidity risk owing to investor neglect. Low P/B stocks on the other hand represent relatively distressed firms as show by weaker track record of their past sales and earnings growth rates (see Fama and French, 1995).

6.5 CONCLUDING REMARKS

Prior research has confirmed a positive relation between profitability and returns for mature markets (see Fama & French, 2008). These results can be explained if
relationship between returns and profitability is examined from entrepreneur’s perspective thus treating profits as a reward for risk bearing.

The above results however confirm a negative relation between profitability and returns which is robust to choice of profitability measure. This could possibly be explained by examining the problem from investor’s perspective. More profitable firms tend to pay higher dividends and therefore are perceived to be less risky by investors. Thus a negative relation is postulated between dividend payouts and firm betas. In other words more profitable (and higher payout) firms should provide lower returns. It is equally important to know whether profitability based anomalous pattern in returns could be explained by standard asset pricing models. One factor CAPM is partially able to explain the alphas on profitability sorted portfolios. Dividend payouts confirm the risk argument for the market factor as a negative relationship between payouts and beta is empirically confirmed.

It is further found that the FF size and value based factors absorb the profitability based returns that are missed by CAPM. Hence the profitability anomaly does not pose an empirical challenge to multifactor asset pricing framework in Indian context. These risk factors however do not bear significant relationship with payout ratios, thus suggesting that alternative explanations might be needed to justify their risk premiums.

The study has strong implications for academicians who are searching for a rational asset pricing theory that can explain prominent equity market anomalies and has a universal appeal. There are also implications for investment managers who are continuously in pursuit of profitable style based trading strategies.
NOTES

1. In this study the terms dividend payouts and payouts have the same meaning.

2. Construction methodology for size and value factors has been adopted from Chapter 4 of this study.

3. The equations have been estimated using fixed effects panel OLS method, which has been chosen over the random effects method based on Wu-Hausman statistic (Chi-sq (1) = 26.23, p-value = 0 for equation 6.2 when the explanatory variable is ROE and Chi-sq (1) = 16.07, p-value = 0.0001 when ROA is the explanatory variable)

4. The equation has been estimated using random effects panel OLS method, which has been chosen over the fixed effects method based on Wu-Hausman statistic (Chi-sq(1) = 0.063, p-value = 0.800).

5. For ROE (ROA) sorted portfolios the average values of market cap (size) for P1 is 22.42 (22.53) and for P5 is 23.70 (23.92). For ROE (ROA) sorted portfolios the average values of P/B for P1 is -0.87 (-0.88) and for P5 is 8.09 (8.81).

6. The equations have been estimated using random effects panel OLS method, which has been chosen over the fixed effects method based on Wu-Hausman statistic (Chi-sq (1)= 2.139, p-value = 0.143 for equation 6.9 and Chi-sq(1) = 1.388, p-value = 0.238 for equation 6.10).
TABLES

Table 6.1  Unadjusted average monthly excess returns on profitability sorted portfolios

<table>
<thead>
<tr>
<th>ROE sorted portfolios</th>
<th>ROA sorted portfolios</th>
</tr>
</thead>
<tbody>
<tr>
<td>P1</td>
<td>P5</td>
</tr>
<tr>
<td>Mean</td>
<td>t-stat</td>
</tr>
<tr>
<td>0.023</td>
<td>2.461</td>
</tr>
</tbody>
</table>

The table shows unadjusted average monthly excess returns for portfolios formed on the basis of profitability viz. ROE and ROA. P1 is the portfolio consisting of 20% of companies with lowest attribute while P5 consists of top 20% companies with highest attribute under consideration.

Table 6.2  Empirical results of the panel OLS regression of payouts on profitability

<table>
<thead>
<tr>
<th>ROE</th>
<th>ROA</th>
</tr>
</thead>
<tbody>
<tr>
<td>β₀</td>
<td>β₁</td>
</tr>
<tr>
<td>t(β₀)</td>
<td>t(β₁)</td>
</tr>
<tr>
<td>0.250*</td>
<td>0.036*</td>
</tr>
<tr>
<td>47.888</td>
<td>3.956</td>
</tr>
<tr>
<td>0.239*</td>
<td>17.686</td>
</tr>
</tbody>
</table>

*Denotes significance at the 5% level using a two tailed t-test

The table reports results of panel OLS regression of payouts on profitability (ROE and ROA) using the following equation

\[ \text{Payout}_{i,t} = \beta_0 + \beta_1 \text{profitability}_{i,t} + \epsilon_{i,t} \]
Table 6.3 Empirical results based on one factor CAPM

Panel a. ROE sorted portfolios

<table>
<thead>
<tr>
<th>Portfolio</th>
<th>a</th>
<th>b</th>
<th>t(a)</th>
<th>t(b)</th>
<th>Adj. R²</th>
</tr>
</thead>
<tbody>
<tr>
<td>P1</td>
<td>0.012</td>
<td>1.166</td>
<td>2.078</td>
<td>17.810</td>
<td>0.638</td>
</tr>
<tr>
<td>P5</td>
<td>0.006</td>
<td>0.988</td>
<td>2.008</td>
<td>30.003</td>
<td>0.833</td>
</tr>
</tbody>
</table>

Panel b. ROA sorted portfolios

<table>
<thead>
<tr>
<th>Portfolio</th>
<th>a</th>
<th>b</th>
<th>t(a)</th>
<th>t(b)</th>
<th>Adj. R²</th>
</tr>
</thead>
<tbody>
<tr>
<td>P1</td>
<td>0.014</td>
<td>1.177</td>
<td>2.485</td>
<td>18.223</td>
<td>0.664</td>
</tr>
<tr>
<td>P5</td>
<td>0.004</td>
<td>0.930</td>
<td>1.69</td>
<td>27.33</td>
<td>0.816</td>
</tr>
</tbody>
</table>

The table reports the regression estimates from time series regressions of excess portfolio returns on profitability sorted portfolios (ROA and ROE) on the returns for the market factor. The CAPM has been operationalised using the excess return version of the market model as stated below:

\[ R_{pt} - R_{ft} = a + b (R_{mt} - R_{ft}) + \epsilon_t \]

Table 6.4 Empirical results of the panel OLS regression of beta on dividend payouts

<table>
<thead>
<tr>
<th></th>
<th>( \gamma_0 )</th>
<th>( t(\gamma_0) )</th>
<th>( \gamma_1 )</th>
<th>( t(\gamma_1) )</th>
<th>Adj. R²</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>0.967*</td>
<td>20.949</td>
<td>-0.074*</td>
<td>-3.235</td>
<td>0.002</td>
</tr>
</tbody>
</table>

*Denotes significance at the 5% level using a two tailed t-test

The table reports the results of the panel OLS regression of beta on dividend payouts using the following equation

\[ \text{beta}_{i,t} = \gamma_0 + \gamma_1 \text{payouts}_{i,t} + \epsilon_{i,t} \]
Table 6.5 Empirical Results for the three factor Fama French Model based on market, size and value factors.

Panel a. ROE sorted portfolios

<table>
<thead>
<tr>
<th>Portfolio</th>
<th>a</th>
<th>b</th>
<th>s</th>
<th>h</th>
<th>t(a)</th>
<th>t(b)</th>
<th>t(s)</th>
<th>t(h)</th>
<th>Adj.R²</th>
</tr>
</thead>
<tbody>
<tr>
<td>P1</td>
<td>-0.005</td>
<td>1.066</td>
<td>0.686</td>
<td>0.522</td>
<td>-0.120</td>
<td>20.983</td>
<td>7.794</td>
<td>5.759</td>
<td>0.791</td>
</tr>
<tr>
<td>P5</td>
<td>0.001</td>
<td>0.997</td>
<td>0.420</td>
<td>-0.269</td>
<td>0.609</td>
<td>35.901</td>
<td>8.748</td>
<td>-5.433</td>
<td>0.886</td>
</tr>
</tbody>
</table>

Panel b. ROA sorted portfolios

<table>
<thead>
<tr>
<th>Port.</th>
<th>a</th>
<th>b</th>
<th>s</th>
<th>h</th>
<th>t(a)</th>
<th>t(b)</th>
<th>t(s)</th>
<th>t(h)</th>
<th>Adj.R²</th>
</tr>
</thead>
<tbody>
<tr>
<td>P1</td>
<td>0.002</td>
<td>1.084</td>
<td>0.523</td>
<td>0.554</td>
<td>0.367</td>
<td>20.776</td>
<td>5.821</td>
<td>5.931</td>
<td>0.789</td>
</tr>
<tr>
<td>P5</td>
<td>0</td>
<td>0.927</td>
<td>0.429</td>
<td>-0.224</td>
<td>0.120</td>
<td>32.142</td>
<td>8.626</td>
<td>-4.341</td>
<td>0.873</td>
</tr>
</tbody>
</table>

The table shows the results of excess returns on profitability (ROE and ROA) sorted portfolios regressed on the returns for the market \( R_{mt} - R_{ft} \) factor and the two proxy portfolios that mimic for size (SMB) and price to book equity (LMH) factors.

\[
R_{pt} - R_{ft} = a + b \left( R_{mt} - R_{ft} \right) + s \left( SMB_t \right) + h \left( LMH_t \right) + e_t
\]

Table 6.6 Empirical results of panel OLS regression of size on dividend payouts and value on dividend payouts

<table>
<thead>
<tr>
<th>( \gamma_0 )</th>
<th>t(( \gamma_0 ))</th>
<th>( \gamma_1 )</th>
<th>t(( \gamma_1 ))</th>
<th>Adj R²</th>
<th>( \gamma_3 )</th>
<th>t(( \gamma_3 ))</th>
<th>( \gamma_4 )</th>
<th>t(( \gamma_4 ))</th>
<th>Adj.R²</th>
</tr>
</thead>
<tbody>
<tr>
<td>22.817</td>
<td>609.45</td>
<td>0.125</td>
<td>1.96</td>
<td>0.001</td>
<td>3.13</td>
<td>3.904</td>
<td>0.989</td>
<td>0.782</td>
<td>0</td>
</tr>
</tbody>
</table>

The table reports the results of panel OLS regression of size on dividend payouts and value on dividend payouts using the following equations

\[
\text{Size}_{i,t} = \gamma_0 + \gamma_1 \text{payouts}_{i,t} + \epsilon_{i,t}
\]

\[
\text{P/B}_{i,t} = \gamma_3 + \gamma_4 \text{payouts}_{i,t} + \epsilon_{i,t}
\]