

Valuation, Profitability, and Subsequent Stock Returns: Firm Fixed-Effects Evidence from Taiwan

Szu-Hsien Lin¹, Chien-Chung Tu², Huei-Hwa Lai^{3*}, Shao-Chun Chiu⁴

¹Department of Accounting and Information Systems, Asia University, Taichung, Taiwan

²Taiwan Instrument Research Institute, National Applied Research Laboratories, Hsinchu, Taiwan

^{3*}Department of Business Administration, Chaoyang University of Technology, Taichung, Taiwan

⁴Department of Accounting and Information Systems, Asia University, Taichung, Taiwan

ABSTRACT: This study examines whether valuation ratios and profitability are associated with subsequent-quarter stock returns in Taiwan. The analysis applies firm fixed-effects regressions with quarter fixed effects and firm-clustered standard errors. The results show that ROE is positively related to returns in the following quarter, whereas P/B and P/S are negatively related to subsequent performance. P/E is not statistically significant. Overall, profitability and valuation provide complementary information about short-term stock returns.

KEYWORDS: stock returns, valuation ratios, profitability, fixed effects, Taiwan stock market

INTRODUCTION

Market prices reflect both firm fundamentals and the expectations embedded in valuation multiples. Profitability indicates a firm's operating strength, whereas valuation ratios show how strongly the market prices that performance. Whether these two dimensions contain distinct information about subsequent stock returns remains an important empirical question.

Previous studies document that value and profitability are related to expected returns. Fama and French (1992) show that book-to-market equity helps explain cross-sectional return differences, while Lakonishok, Shleifer, and Vishny (1994) argue that highly valued firms may underperform when optimistic expectations are revised. Profitability has also been recognized as an important return-related characteristic. Novy-Marx (2013) identifies a profitability premium, and Fama and French (2015) incorporate profitability into their five-factor model.

Despite this evidence, valuation and profitability are often examined separately or through broad cross-sectional comparisons. Such estimates may reflect persistent differences across firms, including industry structure, business models, and long-term risk characteristics. Existing evidence largely emphasizes cross-sectional differences across firms, leaving the role of within-firm variation in valuation and profitability less clearly understood.

This study examines the relationships of P/E, P/B, P/S, and ROE with subsequent-quarter stock returns in Taiwan. Firm fixed effects are used to control for time-invariant company characteristics, while quarter fixed effects capture common market conditions. Standard errors are clustered at the firm level to account for dependence across observations from the same company.

The study contributes by examining both valuation and profitability in a broad market sample and by estimating their relationships using within-firm variation. The findings provide

evidence that profitability and valuation capture distinct dimensions of subsequent stock performance.

LITERATURE REVIEW

Valuation ratios and profitability are widely used to assess expected stock performance. Valuation measures such as P/E, P/B, and P/S indicate how strongly the market prices a firm relative to its earnings, book value, or sales. Higher valuation multiples may reflect favorable growth expectations, but they may also indicate that optimistic information has already been incorporated into current prices.

Fama and French (1992) show that book-to-market equity helps explain differences in stock returns, while Lakonishok, Shleifer, and Vishny (1994) argue that highly valued firms may subsequently underperform when optimistic expectations are revised. Because P/B is the inverse of book-to-market, these findings imply that firms with higher P/B ratios may earn lower subsequent returns.

Novy-Marx (2013) documents a positive relationship between gross profitability and expected returns, while Fama and French (2015) incorporate operating profitability into their five-factor model. Although these measures differ from ROE, together these studies establish profitability as an important dimension in the analysis of expected stock returns. ROE captures earnings generated relative to shareholders' equity and therefore provides an alternative measure of firm profitability. Firms with higher ROE may experience stronger subsequent performance if profitability information is not fully incorporated into prices immediately.

Examining valuation and profitability in the same model helps distinguish the information conveyed by market pricing from that conveyed by operating performance. This study therefore evaluates the joint associations of P/E, P/B, P/S, and ROE with subsequent-quarter stock returns using firm fixed effects. The approach distinguishes within-firm variation from persistent differences across companies and controls for common quarterly market conditions.

DATA AND METHODOLOGY

This study uses quarterly data for firms listed on the Taiwan Stock Exchange and Taipei Exchange from 2019Q1 to 2024Q2.

Financial ratios and stock returns were obtained from the Taiwan Economic Journal database. After excluding observations with missing values, the final sample contains 20,647 firm-quarter observations from 1,184 firms over 22 quarters.

The dependent variable is the stock return in the subsequent quarter, denoted as $Return_{i,t+1}$. The explanatory variables, measured in quarter t , are the price-to-earnings ratio (P/E), price-to-book ratio (P/B), price-to-sales ratio (P/S), and return on equity (ROE). Stock returns and ROE are expressed in percentage points. All continuous variables were winsorized at the 1st and 99th percentiles using the full estimation sample.

The empirical model is:

$$Return_{i,t+1} = \beta_0 + \beta_1 PE_{i,t} + \beta_2 PB_{i,t} + \beta_3 PS_{i,t} + \beta_4 ROE_{i,t} + \alpha_i + \gamma_t + \varepsilon_{i,t+1}$$

where α_i and γ_t denote firm and quarter fixed effects, respectively.

Three specifications are estimated. Model 1 includes firm fixed effects. Model 2 adds quarter fixed effects. Model 3 uses the same specification as Model 2 but reports standard errors clustered at the firm level to account for within-firm dependence over time (Petersen, 2009). Model 3 is treated as the preferred specification.

The Hausman test (Hausman, 1978) rejects the random-effects specification:

$$\chi^2(4) = 719.19, p < 0.001$$

This result supports the use of fixed effects. Statistical significance is evaluated at the 1%, 5%, and 10% levels.

EMPIRICAL RESULTS

Table 1 presents the descriptive statistics for the final sample of 20,647 firm-quarter observations. The mean subsequent-quarter stock return is 5.06%, with a standard deviation of 19.20%. The average P/E, P/B, and P/S ratios are 30.45, 2.13, and 2.36, respectively, while the mean ROE is 4.36%. Observations with missing values were excluded, and all continuous variables were winsorized at the 1st and 99th percentiles.

Table 2 reports the fixed-effects regression results. Model 1 includes firm fixed effects, Model 2 adds quarter fixed effects,

and Model 3 retains the specification of Model 2 but reports standard errors clustered at the firm level. The discussion focuses on Model 3, which is the preferred specification.

The coefficient on P/E is negative but statistically insignificant. This indicates that P/E is not reliably associated with subsequent-quarter stock returns after controlling for the other explanatory variables, firm fixed effects, and quarter fixed effects.

P/B is negatively and significantly associated with subsequent-quarter returns. The coefficient of -4.0569 is statistically significant at the 1% level. Holding other variables constant, a one-unit increase in P/B is associated with an approximately 4.06-percentage-point decrease in the return realized in the following quarter.

P/S is also negatively and significantly associated with subsequent-quarter returns. Its coefficient is -0.5179 and is statistically significant at the 1% level. The result remains significant after controlling for P/E, P/B, and ROE.

ROE is positively and significantly associated with subsequent-quarter returns. The coefficient of 0.4640 is statistically significant at the 1% level, indicating that a one-percentage-point increase in ROE is associated with an approximately 0.46-percentage-point increase in the return realized in the following quarter.

The coefficient signs remain unchanged across Models 1–3. P/B and P/S are consistently negative, ROE is consistently positive, and P/E remains statistically insignificant. The within R^2 increases from 0.0407 in Model 1 to 0.0423 in Models 2 and 3.

Overall, the results indicate that profitability and valuation relate to subsequent stock performance in different ways. ROE is positively associated with subsequent returns, whereas P/B and P/S are negatively related to subsequent performance. P/E does not exhibit a statistically reliable relationship.

DISCUSSION AND CONCLUSION

This study examines whether valuation ratios and profitability are associated with subsequent-quarter stock returns in Taiwan. Using firm fixed-effects regressions with quarter fixed effects

and firm-clustered standard errors, the analysis focuses on within-firm variation while controlling for common market conditions.

The results indicate that higher ROE is linked to stronger returns in the following quarter. This finding suggests that stronger profitability contains useful information about subsequent stock performance. One possible explanation is that changes in profitability are not fully reflected in market prices immediately, although the present analysis does not directly test this mechanism.

In contrast, higher P/B and P/S ratios are linked to weaker subsequent-quarter performance. These valuation measures may indicate that favorable expectations are already embedded in current prices, leaving less room for further short-term appreciation. The negative coefficients therefore support a valuation-based interpretation in which relatively expensive firms tend to experience weaker subsequent performance.

P/E is not statistically significant after the other valuation measures, ROE, firm effects, and quarter effects are controlled for. One possible explanation is that P/E is particularly sensitive to temporary earnings fluctuations and small earnings denominators. Compared with P/B and P/S, P/E appears to provide less stable information in the present setting.

Overall, the findings show that profitability and valuation capture different dimensions of subsequent stock performance. ROE shows the clearest positive relationship with subsequent performance, whereas higher P/B and P/S ratios are linked to lower returns. These relationships remain stable across the three model specifications, and the Hausman test supports the fixed-effects approach.

The study nevertheless has several limitations. It focuses on the Taiwan equity market and a single quarterly horizon. The fixed-effects design identifies within-firm associations but does not establish causality. In addition, the timing of publicly available accounting information may affect the interpretation of the results. Future research may examine alternative return horizons, align accounting variables with announcement dates, and evaluate out-of-sample portfolio performance.

Table 1. Descriptive Statistics

Variable	N	Mean	Std. Dev.	Minimum	Median	Maximum
Return _{t+1}	20,647	5.0638	19.2007	−34.9023	1.9319	88.0468
P/E	20,647	30.4525	60.8593	3.8600	14.1500	473.7754
P/B	20,647	2.1310	1.5982	0.5500	1.6500	9.7354
P/S	20,647	2.3563	3.2071	0.1400	1.4100	23.0708
ROE	20,647	4.3552	5.3596	−5.6508	3.1400	28.1562

Note: Observations with missing values were excluded. Continuous variables were winsorized at the 1st and 99th percentiles. Stock returns and ROE are expressed in percentage points.

Table 2. Fixed-Effects Panel Regression Results

Dependent variable: Subsequent-quarter stock return

Variable	Model 1	Model 2	Model 3
P/E	−0.0017 (0.0017)	−0.0039 (0.0018)	−0.0039 (0.0026)
P/B	−4.4862*** (0.1746)	−4.0569*** (0.1641)	−4.0569*** (0.3238)
P/S	−0.5724*** (0.0907)	−0.5179*** (0.0842)	−0.5179*** (0.1614)
ROE	0.3008*** (0.0308)	0.4640*** (0.0294)	0.4640*** (0.0392)
Firm fixed effects	Yes	Yes	Yes
Quarter fixed effects	No	Yes	Yes
Firm-clustered SE	No	No	Yes
Within R ²	0.0407	0.0423	0.0423
Observations	20,647	20,647	20,647
Firms	1,184	1,184	1,184
Quarters	22	22	22

Note: Standard errors are reported in parentheses. Model 3 retains the specification of Model 2 but reports standard errors clustered at the firm level. Continuous variables were winsorized at the 1st and 99th percentiles. ***, **, and * denote significance at the 1%, 5%, and 10% levels, respectively.

Table 3. Hausman Specification Test

Test statistic	Value
Hausman χ^2	719.1907
Degrees of freedom	4
p-value	< 0.001
Preferred model	Fixed effects

Note: The null hypothesis is that the random-effects estimator is consistent and efficient. The significant test statistic rejects the null hypothesis and supports the fixed-effects specification.

REFERENCES

1. Fama, E. F., & French, K. R. (1992). The cross-section of expected stock returns. *The Journal of Finance*, 47(2), 427–465. <https://doi.org/10.1111/j.1540-6261.1992.tb04398.x>
2. Fama, E. F., & French, K. R. (2015). A five-factor asset pricing model. *Journal of Financial Economics*, 116(1), 1–22. <https://doi.org/10.1016/j.jfineco.2014.10.010>
3. Hausman, J. A. (1978). Specification tests in econometrics. *Econometrica*, 46(6), 1251–1271. <https://doi.org/10.2307/1913827>
4. Lakonishok, J., Shleifer, A., & Vishny, R. W. (1994). Contrarian investment, extrapolation, and risk. *The Journal of Finance*, 49(5), 1541–1578. <https://doi.org/10.1111/j.1540-6261.1994.tb04772.x>
5. Novy-Marx, R. (2013). The other side of value: The gross profitability premium. *Journal of Financial Economics*, 108(1), 1–28. <https://doi.org/10.1016/j.jfineco.2013.01.003>
6. Petersen, M. A. (2009). Estimating standard errors in finance panel data sets: Comparing approaches. *The Review of Financial Studies*, 22(1), 435–480. <https://doi.org/10.1093/rfs/hhn053>