
Profitability, Investment and Average Returns

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In this article, the authors develop empirical models to explain the effects of companies' profitability and investment on stock returns. Evidence from cross-sectional regressions shows that lagged profitability, asset growth, and accruals used as proxies for expected profitability and investment can predict stock returns well. More complicated proxies—fitted values from regressions to forecast profitability and asset growth—do not perform as well as the simple proxies. Robust checks confirm the persistence of the model's predictive power among different size and B/M (book-to-market ratio) groups.

Several researchers, most notably Fama and French, have shown that stocks with higher book-to-market ratios provide higher returns. Studies also have found that stock returns are positively related to the company's profitability and company strength (expected net cash flows) and negatively related to accruals. What is different in this paper is that the authors test for the effects of profitability and investment (asset growth) on expected returns by estimating the valuation equation in three steps: (1) first-stage regressions to develop proxies for expected profitability and investment, (2) second-stage cross-section return regressions with simple proxies (lagged profitability and asset growth variables) and more complicated proxies (fitted values of profitability and asset growth variables from first-stage regressions), and (3) portfolio and model specification tests comparing predicted with actual returns. More specifically, proxies for the expected values of profitability and investment are developed based on accounting fundamentals, the company's stock return, analysts' earnings forecasts, and a composite measure of company strength as explanatory variables.

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Tests to explain stock returns are based on multiple regression models starting with the base model and then adding the other relevant explanatory variables in a progressive manner. This approach enables the authors to discern the marginal effects of the new variables and the changes in the overall explanatory power of the model.

The base model consists of just two variables—company size and B/M (book-to-market ratio)—to explain their effects on stock returns, and only the coefficient for B/M is significant, showing a positive relation to the stock returns. Next, lagged profitability and lagged asset growth (simple proxies for expected profitability and investment) are added to the model. The data show that the stock returns are positively associated with profitability and negatively associated with asset growth. The coefficient for B/M remains about the same and is statistically significant. Next, accruals are added and the coefficient for positive accruals is found to be negatively related to stock returns. Finally, two variables reflecting company strength (probability of default on debt and a composite index of company strength developed by Piotroski [*Journal of Accounting Research*, 2000]) are included in the model. The coefficient for the probability of default variable is negative and that for company strength is positive.

In the second set of regressions, the authors repeat the same format—progressive addition of explanatory variables—but this time they use the fitted values of profitability and asset growth (more complicated proxies for expected profitability and investment) to explain their effects on stock returns. The regression coefficients reveal that the fitted values (as opposed to lagged values in previous regressions) produce weaker evidence of profitability effects in stock returns and a lack of relationship with respect to asset growth. The question that came next is, Why do simple lagged profitability and asset growth variables produce better descriptions of average returns than the more complicated proxies do? The authors explain that it could be caused by two sources of measurement error when the regression-fitted values are used as explanatory variables for returns.

Next, the authors conduct robust checks comparing predicted returns with actual returns on portfolios. For this analysis, they allocate individual stocks to one of the two portfolios formed according to high or low expected returns relative to the median returns for the

year and by two weighting schemes—equally weighted and value weighted. The findings generally reveal that the predicted average spreads of returns between high and low portfolios are fairly similar for both equally weighted and value-weighted portfolios. Interestingly, for equally weighted portfolios, the average actual return spread (between low and high portfolios) is larger than the corresponding prediction spread. For value-weighted portfolios, the average actual return spread (between low and high portfolios) is smaller than the corresponding prediction spread. From this, the authors infer that the average return effects are stronger among smaller companies. Addition of lagged profitability and asset growth to the base model (with the company size and book-to-market ratio already in the model) increases the average predicted spreads and actual spreads, but only modestly. Adding positive and negative accruals increases those values further. The measures of company strength do not seem to have any economically meaningful information about expected returns beyond what is conveyed by profitability, asset growth, and accruals.

The authors then check for pervasiveness of return predictions and specification of the model. For this analysis, the authors allocate individual stocks to different portfolios formed according to two size groups—small and big—and three book-to-market groups—from low to high.

In baseline regressions (with only company size and B/M as explanatory variables), the variation in average spreads (between predicted high-minus-low returns) is rather large among the six size–B/M portfolios. The average actual spreads in returns replicate the predicted spreads reasonably well, with the exception of the small-growth portfolio. All six size–B/M portfolios show improvement in average predicted and actual return spreads with the addition of lagged profitability and growth to the base model. Adding lagged accruals to the model increases the high-minus-low spreads modestly in all six size–B/M groups for both predicted and actual returns (again with the exception of the small-growth group).

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