

The UMO (Undervalued Minus Overvalued) Factor

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This document provides an overview of the UMO factor. It describes its motivation, construction, and how to obtain it and use it. Behavioral theories suggest that investor misperceptions and market mispricing will be correlated across firms. The UMO factor uses equity and debt financing to identify common misvaluation across firms. UMO is a zero-investment portfolio that goes long on firms that issue securities and short on firms that repurchase. UMO captures comovement in returns beyond that in standard multifactor models, substantially improves the Sharpe ratio of the tangency portfolio, and carries heavy weight in the tangency portfolio. Loadings on UMO strongly predict the cross-section of returns on both portfolios and individual stocks, even among firms not recently involved in external financing activities, and even after controlling for other standard predictors. UMO was proposed by Hirshleifer and Jiang (2010), who provide further evidence suggesting that UMO loadings proxy for the common component of a stock's misvaluation. For further details, see Hirshleifer, David, and Danling Jiang, "A Financing-Based Misvaluation Factor and the Cross-Section of Expected Returns," *Review of Financial Studies* (2010), 23(9), 3401-3436.

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Behavioral theories suggest that investor misperceptions and market mispricing will be correlated across firms. We use equity and debt financing to identify common misvaluation across firms, or what we call factor mispricing. We define a misvaluation factor (or mispricing factor) as any statistical common factor in stock returns that is substantially correlated with the common mispricing of individual stocks.

Commonality in misvaluation can occur when investors misinterpret signals about a fundamental economic factor, or when there are shifts in investor sentiment about firm characteristics or ‘styles’. If firms undertake new issues or repurchases to exploit mispricing, such events should reflect information possessed by managers about stock mispricing (above and beyond other observable characteristics such as book-to-market equity). Therefore, issue and repurchase firms should have extreme sensitivities to mispricing factors. We can therefore construct a misvaluation factor by going long on repurchase stocks and short on the new issue stocks. This misvaluation factor is predicted to have a nonnegligible positive variance, even after controlling for the market or other well-known factors. We call this misvaluation factor UMO (Undervalued Minus Overvalued). Hirshleifer and Jiang (2010) test the hypothesis that a stock’s sensitivity to the UMO factor (its loading) is a measure of its misvaluation, and therefore that UMO loadings are positive predictors of future abnormal returns.

1. The Construction of UMO

UMO is a zero-investment portfolio that is long on underpriced (repurchase) firms (U) and short on overpriced (new issue) firms (O). At the end of each June, the portfolio O contains firms with Initial Public Offerings (IPOs), Seasoned Equity Offerings (SEOs), debt offerings (including both straight and convertible debt) in the past 24 months. All equity and debt issuers are identified based on Professor Jay Ritter’s new issue database and the SDC Global New Issues dataset. The portfolio U contains firms that have annual equity or debt reduction exceeding 1% of average total assets in either of the two most recent fiscal years with the

fiscal year end as of December of year $t - 1$. The equity and debt reductions are computed using Compustat data.¹ Firms that satisfy both the criteria for O and U are excluded from both O and U. UMO return is the difference between the equal-weighted return of U and that of O from July of year t through June of year $t + 1$. Then, UMO is rebalanced. Our results are qualitatively similar if we form UMO only based on equity, not debt, repurchases and issuances.

2. Characteristics of UMO

Over the sample period July 1992 through December 2008, UMO delivers an average monthly return of 0.93% per month, or over 11% per year. UMO has an significant abnormal return of 6%–9% per annum relative to the Fama-French three factor model, or those augmented by the momentum factor and the investment factor.

UMO produces a Sharpe ratio of 0.30, significantly higher than those of the market factor (0.08), the SMB factor (0.05), the HML factor (0.16), and the momentum factor (0.21), and comparable to the investment factor (0.30). Adding UMO to the Fama-French three factors increases the maximum Sharpe ratio by nearly 75%. The tangency portfolio generally places a substantial weight on UMO and tends to eliminate the weight on HML after UMO is included. This probably occurs as UMO is highly correlated with HML (0.65), but delivers much higher expected returns with similar volatility. Thus, UMO is a better proxy than HML for misvaluation or for priced factors.

Adding UMO to the Fama-French three factor model visibly reduces the pricing errors on the 25 size and book-to-market portfolios in time series regressions. In particular, the substantial pricing errors present among the four corner portfolios are significantly reduced

¹Total repurchase of common stocks is the purchase of common and preferred stocks (Compustat variable *PRSTKC*) less any decrease in preferred stocks. Total issuance of common stocks is the sale of common and preferred stocks (*SSTK*) less any increase in preferred stocks. We measure preferred stocks as, in order of preference, the redemption value (*PSTKRV*), the liquidating value (*PSTKL*), or the carrying value (*PSTK*). Long-term debt reduction is defined as long-term debt reduction (*DLTR*) minus long-term debt issuance (*DLTIS*) from the cash flow statement.

and become insignificant for all but the extreme small-growth portfolio. After adding UMO to the 3 factors, the F -statistic that tests whether the alphas are jointly equal to zero no longer rejects that null.

3. The Ability of UMO Loading to Predict the Cross Section of Stock Returns

UMO loadings help to forecast the cross section of returns both at the portfolio and the firm levels. At the portfolio level, we estimate UMO loadings from previous five-year monthly returns. We show that UMO loadings predict the cross-section of portfolio returns after controlling for the loadings on the the Fama-French three and other factors, with an estimated UMO premium of about 6%–9% per annum. This finding applies to the 25 size and book-to-market portfolios as well as various other portfolios.

At the firm level, we obtain UMO loadings from two approaches that account for the transitory nature of firm-level mispricing. In one, we estimate UMO loadings from daily returns of individual stocks over a shorter period, 12 months. The hedge portfolio that is long the highest and short the lowest loading decile yields an annual abnormal return of 7%–10% per year.

In the other, we assign stocks the loadings of portfolios that are matched by relevant firm characteristics that are potentially related to mispricing, including size, book-to-market, and the external financing variable of Bradshaw, Richardson, and Sloan (2006). UMO loadings have incremental power to predict returns after controlling for various firm characteristics, including firm size, book-to-market equity, short-, intermediate, and long-horizon returns, industry dummies, the external financing variable of Bradshaw, Richardson, and Sloan (2006), the net composite issuance variable of Daniel and Titman (2006), the asset growth variable of Cooper, Gulen, and Schill (2008), the investment-asset ratio of Lyandres, Sun, and Zhang (2008), the net operating asset variable of Hirshleifer, Hou, Teoh, and Zhang (2004), the

operating accruals of Sloan (1996), and the abnormal capital investment variable of Titman, Wei, and Xie (2004). The regression estimates imply an abnormal return from UMO loadings of over 15% per year.

4. Conclusion

Existing research has documented that new equity issues and repurchases predict future returns, and has proposed that firms undertake equity issues in response to overpricing and repurchases in response to underpricing. This suggests that such financing events seem to reflect stock mispricing perceived by managers that is not fully captured by firm characteristics such as book-to-market equity. Hirshleifer and Jiang (2010) find that there is comovement in returns associated with financing events. Firms that engage in issuance or repurchase subsequently move together more, but such comovement is not limited to firms that are involved with these transactions. General firms load upon the misvaluation factor, UMO, which is therefore a general factor influencing stock returns. Furthermore, the sensitivity of a stock's return to the misvaluation factor is a strong predictor of its future returns in the cross-section. We therefore suggest that UMO can be useful for empirical research to capture commonality in misvaluation, and to generate measures of the misvaluation of stocks and portfolios.

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