# THE IDIOSYNCRATIC MOMENTUM ANOMALY: A STUDY OF VIETNAM STOCK MARKET

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(Received: September 26, 2022; Accepted: December 05, 2022)

**Abstract** - This paper examines the relationship between idiosyncratic momentum and future returns in the Vietnam stock market. This study utilizes the Vietnam Stock market from the DataStream database, containing listed and delisted stocks from July 2010 to June 2021. Based on the portfolio-level analysis and Fama-Macbeth regressions results, we find that there is a positive and significant relationship between idiosyncratic momentum and future returns. Moreover, these results are robust after controlling for several well-known variables, such as market beta, firm size, book-to-market, and momentum. We also find that the predicted power of idiosyncratic momentum cannot be explained by crash risk, however, idiosyncratic momentum is driven by market states.

**Key words** - Idiosyncratic momentum; Price momentum; Anomaly; Crash risk; Vietnam stock market

## 1. Introduction

Among anomalies, price momentum effect is widely document in the asset pricing study. According to Jegadeesh & Titman [4], the effect of price momentum can be defined as the stocks that have performed well in the past and are likely to outperform in the future. Many studies confirm the positive relationship between price momentum and future return in the international market, as well as in different asset classes [5, 6]. Recently, Blitz, Hanauer, & Vidojevic [1, 2] have introduced the idiosyncratic momentum (IMOM) as the same former principle of price momentum as in Jegadeesh & Titman [4]. According to Blitz, Hanauer and Vidojevic [1, 2], idiosyncratic momentum is estimated using the last 12-month residual returns relative to Fama and French three-factors model. Especially, this anomaly is priced in the cross-sectional of stock returns in the market where the effect of price momentum does not exist such as Japanese stock market [7], Chinese stock market [8], and the Asian markets such as Hong Kong, Singapore, Taiwan and Thailand [9].

Motivates by previous study, in this research, we investigate the predicted power of idiosyncratic momentum effect in the Vietnam stock market. In the other words, this research paper aims to provide out-of-sample evidence about the idiosyncratic momentum effect from the emerging stock market, such as Vietnam stock market. To the best of our knowledge, there are no relevant studies on Vietnam stock market. Following Blitz, Hanauer and Vidojevic [1, 2], Qi Lin [8], the core objectives of this research are that: (i) Whether IMOM is priced in the Vietnam stock market; (ii) Whether IMOM subsumes by other common variables, as well as price momentum; (iii) Whether IMOM can be driven by crash risk [10], and market states [11]. To test these hypotheses, we perform univariate portfolio analysis and Fama-MacBeth [3] cross-sectional regressions by using a sample of non-financial firms listed on the Hochiminh Stock Exchange (HOSE) and Hanoi Stock Exchange (HNX) from July 2010 to June 2021.

To achieve our research goals, we first use the portfolio analysis method, which is employed to investigate the cross-sectional relations between IMOM and future return. This method is useful for us to understand variations in the characteristics of stock across different portfolios. However, portfolio analysis is a difficult setting in which to control for multiple effects or factors simultaneously. Therefore, we next evaluate the relationship between IMOM and future returns by using Fama and Macbeth [3] cross-sectional regressions. Unlike portfolio analysis, FM regression analysis allows us to control for a large set of other variables when examining the relationship of IMOM and future return.

We find that the idiosyncratic momentum effect is positively and statistically significant related to predicting future return in Vietnam stock market. Specifically, this study investigates the relationship between IMOM and future return based on the monthly return in Table 1. The IMOM effect is statistically and economically significant, with a hedge portfolio taking long (short) positions in high (low) IMOM stocks generating excess returns over 0.79% per month (9.48% annually). The difference between two portfolios is about 5.17% per year. Comparing to the average risk premium of international the stock markets of 5.9% based on Dimson, Marsh and Staunton [12], the 5.17% IMOM effect is economically significant.

Furthermore, we find that this IMOM anomaly cannot be explained by the crash risk as in [10]. However, our result shows that IMOM can be driven by market states. Particularly, IMOM return associated with Up market can predict positively and significantly at 1% future return. Thus, our study contributes to the literature is threefold. First, we are the first study to determine the magnitude of IMOM anomaly that was recently discovered in the international market such as US, Japan, China but hasn't yet been documented in the Vietnam stock market. Second, we analyze the incremental predicted power for IMOM after controlling for Fama & French's [13] three-factor model, and Fama and French's [14] five-factor model. Third, we also find that the IMOM effect is driven by market status. Our finding is in line with previous studies on other in Japanese [7], China [8], Hong Kong, Singapore, Taiwan, and Thailand [9].

The finding of this study provides the following practical implications. First, this research topic has attracted special attention from domestic and international investors due to the rapid internationalization of Vietnam's stock market and the attractive characteristics of the idiosyncratic momentum profitability, which could create interesting opportunities for investors. Second, with the economic significance of the IMOM anomalies, the mean-variance optimizing investors should employ the idiosyncratic momentum factor in their investment strategy, next to traditional factors such as the market, size, and value in the Vietnam stock market.

## 2. Data and variable constructions

### *2.1. Data*

The data was primarily obtained from the DataStream database including the daily, monthly data, and accounting data. Following Jegadeesh & Titman [4], in order to maximize the economic and practical significance of our results, we include the following filters on our sample of stocks. First, we exclude all stocks with an (unadjusted) priceless than 5000 VND, firms with a negative book value of equity, and firms in the financial sector. In addition, we exclude all stocks that traded fewer than 15 trading days during month t-1. Finally, we exclude any stock in our sample for less than 12 months at the time of portfolio formation. Our sample includes all listed and delisted stocks from July 2010 to June 2021. The typical stock in our sample has an approximately 139-month long time series.

### *2.2. Variable Constructions*

We estimate idiosyncratic momentum (IMOM) variable in three steps following Blitz, Hanauer and Vidojevic [1, 2]. First, the monthly residual returns ($\varepsilon_{i,t}$) is estimated relative to Fama & French's [13] three-factor over the period of 36 months from t-36 to t-1, as in Equation (1).

$$R_{i,t} - R_{f,t} = \alpha_i + \beta_1 RMRF_t + \beta_2 SMB_t + \beta_3 HML_t + \varepsilon_{i,t} \quad (1)$$

where $R_{i,t}$ is stock i's return on month t, $R_{f,t}$ is the risk-free rate on month t by using the one-month interbank offer rate. RMRF, SMB, HML are the market, size, value factors following Fama & French [13]. We require at least 36-month window to estimate the monthly IMOM.

Secondly, we estimate the monthly residual returns as in Equation (2):

$$e_{i,t} = R_{i,t} - R_{f,t} - \hat{\alpha}_{i,t} + \hat{\beta}_1 RMRF_t - \hat{\beta}_2 SMB_t + \hat{\beta}_3 HML_t \quad (2)$$

Finally, IMOM is defined as the monthly prior (2-12) residual-adjusted mean residual return as in Equation (3)

$$IMOM_{i,t} = \frac{\sum_{t-12}^{t-2} e_{i,t}}{\sqrt{\sum_{t-12}^{t-2} (e_{i,t} - \bar{e_i})}} \quad (3)$$

For other controlling variables, we include a set of standard controls variables: market beta, size and book-to-market ratio following Fama & French [13], momentum returns (the cumulative return over months t-12 to t-2), Following Fama & French [14], Operating profitability (OP) is annual revenues minus cost of goods sold, interest expense, and selling, general, and administrative expenses divided by book equity for the last fiscal year end in t-1; Investment (INV) is the percentage change in firm's total assets from year t-2 and t-1 divided by t-2 total assets; These twos variables are calculated in December of each year and assigned to all months in the calendar year starting the following July through June. To ensure that we only use the information available to the investor at the time of trading, we match accounting data from year-end T − 1 with monthly returns from July of year T to June of year T + 1 as in Fama & French [14].

## 3. Result

### *3.1. Univariate analysis of anomalies and stock returns*

In this part, we examine the predicted power of IMOM using a portfolio analysis and a cross-sectional test. Based on these tests, we can examine that whether IMOM is subsumed by other common factors [1, 2, 13]. We first present the portfolio analysis results in Table 1, and then the Fama and Macbeth [3] cross-sectional test in Table 2.

Table 1 shows average monthly excess returns relative to risk-free rate (EXRET), volatility (VOL), Sharpe ratio (SHA), risk-adjusted return of market model (CAPM alpha), risk-adjusted return of Fama-French's three-factor model (FF3 alpha), risk-adjusted return of Fama-French's five-factor model (FF5 alpha) for quintile portfolio using equal-weighted. The performance of zero-cost portfolio, which is the difference between the highest portfolio (H) and the lowest portfolio (L), is presented in the H-L row of the table along with associated t-statistics, adjusted following Newey & West [14] using five lags. We also provide the GRS test which represents the F-test statistic of Gibbons [15] and p(GRS) is the p-value for GRS F-test.

***Table 1.*** *Performance of portfolios sorted on idiosyncratic momentum*

| | EXRET | VOL | SHA | Alpha CAPM | Alpha 3FM | Alpha 5FM |
|---|---|---|---|---|---|---|
| **L** | 0.0013<br>(0.35) | 0.1046 | 0.3989 | 0.0009<br>(0.24) | -0.0006<br>(-0.18) | 0.0020<br>(0.61) |
| **2** | 0.0075**<br>(2.21) | 0.1029 | 0.4090 | 0.0072**<br>(2.07) | 0.0060*<br>(1.75) | 0.0057**<br>(2.46) |
| **3** | 0.0079**<br>(2.46) | 0.1023 | 0.5578 | 0.0074**<br>(2.28) | 0.0060*<br>(1.84) | 0.0068**<br>(2.56) |
| **4** | 0.0086<br>(1.24) | 0.0995 | 0.6062 | 0.0074<br>(1.13) | 0.0065<br>(0.74) | 0.0070*<br>(1.70) |
| **H** | 0.0092**<br>(2.20) | 0.0987 | 0.7164 | 0.0086**<br>(2.04) | 0.0072*<br>(1.76) | 0.0093**<br>(2.38) |
| **H-L** | 0.0079***<br>(2.99) | 0.0633 | 0.3175 | 0.0077***<br>(3.00) | 0.0078***<br>(2.92) | 0.0073***<br>(2.62) |
| **GRS**<br>**(*p*-val)** | | | | 6.7321<br>(0) | 7.6952<br>(0) | 6.4812<br>(0) |

*We show the equal-weighted (EW) excess returns of decile portfolios sorted on idiosyncratic momentum (IMOM). We also present the excess return, volatility, Sharpe ratio, CAPM alpha, FF3 alpha, FF5 alpha. * Significant at the 10% level; ** Significant at the 5% level; *** Significant at the 1% level.*

In Table 1, we can see that excess returns (EXRET), Sharpe ratios (SHA) increases from the lowest portfolio to the highest portfolio. For example, the average EXRET (SHA) value of IMOM increases monotonically from 0.0013 for the lowest of IMOM to 0.0092 for stocks in the highest IMOM. We also observe this phenomenon in the CAPM alpha, FF3 alpha, and FF5 alpha portfolios.

Focusing on the relation between IMOM and future stock returns, the results indicate a strong positive and statistical significantly relation between IMOM and expected stock returns in the Vietnam stock market. Particularly, the average H-L EXRET difference between the return of the high-IMOM (quintile 5) and low-IMOM (quintile 1) portfolios is 0.0079 with a t-statistic of 2.99. The difference portfolio's abnormal returns of 0.0077 per month (t-statistic = 3.00), 0.0078 per month (t-statistic = 2.92), and 0.0073 per month (t-statistic = 2.62) relative to the CAPM, FF3, and FF5 risk models, respectively, are positive and statistically significant.

With the GRS test results in the last row of Table 1, it can be seen that all GRS test of the CAPM, FF3, and FF5 factor model are 6.7321, 7.6952, and 6.4812, respectively. These results indicate that CAPM, FF3, FF5 factor model cannot explain the IMOM. In sum, the result of the relation between momentum and future stock returns with univariate portfolio analyses is positive and significant at the conventional level.

So far, we have already observed the pricing of idiosyncratic momentum in the Vietnam stock market by using the single portfolio sort method. However, as Fama & French [17] point out, portfolio tests are limited by the number of control variables at one time. Therefore, as a robustness test, we next perform Fama-Macbeth's cross-sectional regressions which are necessary to control the large set of potential covariates. In fact, by doing this test we can examine the IMOM effect after controlling several common variables such as price momentum (MOM) following Jegadeesh & Titman [4]; market beta (BETA), firm size (SIZE), and Book to market ratio (BM) following Fama & French [13]; Operation profit (OP), and Investment (INV) following Blitz, Hanauer and Vidojevic [2].

In Table 2, we show the results in the cross-sectional regressions that are similar to Fama & Macbeth [3]. In particular, each month, we perform the following Fama - MacBeth regressions with different firm characteristics included as control variables following Equation (4):

$$R_{i,t+1} = \alpha_0 + \beta_1 IMOM_{i,t} + \beta_{X_n} X_{i,n,t} + \epsilon_{i,t+1} \quad (4)$$

where $R_{i,t+1}$ is the realized return on stock i in month t+1. $X_{i,n,t}$ is the set of control variables, including: Momentum (MOM), market beta (BETA), firm size (SIZE), book-to-market (BM), Operation profit (OP), and Investment (INV). We report the average coefficients for each anomaly and the Newey-West t-statistics (with a lag of 5) from the Fama-MacBeth regressions in Table 2.

***Table 2.*** *Fama-Macbeth cross-sectional regressions*

| | Model 1 | Model 2 | Model 3 | Model 4 |
|---|---|---|---|---|
| **IMOM** | 0.0022***<br>(2.59) | 0.0028***<br>(3.16) | | 0.0029***<br>(3.26) |
| **MOM** | | -0.0027<br>(-0.85) | -0.0002<br>(-0.07) | -0.0030<br>(-0.83) |
| **BETA** | | -0.0042<br>(-1.26) | -0.0041<br>(-1.23) | -0.0040<br>(-1.23) |
| **SIZE** | | 0.0012<br>(0.75) | 0.0014<br>(0.93) | 0.0012<br>(0.81) |
| **BM** | | 0.0038<br>(0.92) | 0.0047<br>(1.17) | 0.0040<br>(0.98) |
| **OP** | | | 0.0506<br>(0.37) | 0.0504<br>(0.37) |
| **INV** | | | 0.0019<br>(0.64) | 0.0023<br>(0.79) |
| **Adj-$R^2$** | 0.0028 | 0.0323 | 0.0371 | 0.0392 |

*We provide the estimated coefficient and t-statistics from the cross-sectional regressions of individual stock excess returns, are presented in the following table. We use the Fama & MacBeth [3] procedure to estimate the cross-sectional models and average the time-series of estimated regression coefficients. The penny stocks (price ≤ 5000 VND) are excluded from our sample data. We report the Newey and West [14] adjust t-statistic (with a lag of 5) are reported in parentheses. * Significant at the 10% level; ** Significant at the 5% level; *** Significant at the 1% level.*

In Table 2, we report the time-series averages of the cross-sectional regression coefficients, along with t-statistics (in parentheses), adjusted following Newey & West [14] using five lags. All independent variables are winsorized at the 0.5% level on a monthly basis. The results in all of the Model indicate a strongly positive relationship between IMOM and future stock returns after controlling for the effects of MOM, BETA, ME, BM, OP, and INV since, regardless of the specification, the average coefficient on IMOM is positive and statistically significant.

Specifically, in Model 1, when IMOM is the only independent variable in the regression, the average coefficient is 0.0022 with a t-statistic value of 2.59. In Model 4, when we add all the control variables, the average coefficient of IMOM is 0.0029 with a t-statistic value of 3.26. Thus, controlling for the effects of the other predictors of stock returns appears to have very little effect on the relation between IMOM and future stock returns.

In sum, from Table 1 and Table 2, we can conclude that there is an evidence of the relationship between IMOM and future return in the Vietnam stock market. This result is consistent with the finding of Blitz, Hanauer and Vidojevic [2] in the international stock market.

### *3.2. Momentum crashes*

Following Daniel & Moskowitz [10], Blitz, Hanauer and Vidojevic [2], we conduct the regression as in Equation (5):

$$R_{i,t} = \alpha_0 + \alpha_B I_{B,t} + [\beta_0 + I_{B,t}(\beta_B + I_{U,t}\beta_{B,U})] \cdot (R_{mkt} - R_{f,t}) + \epsilon_{i,t} \quad (5)$$

where $I_{B,t}$ and $I_{U,t}$ are dummies indicating whether the past cumulative twelve-month return of the market is negative $I_{B,t}$ and whether the subsequent month is non-negative $I_{U,t}$. $\beta_B$ indicates whether the market beta differs after past bear markets, while $\beta_{B,U}$ indicates the extent to which the subsequent up- and down-market betas differ after such market. The results are presented in Table 3.

***Table 3.*** *Momentum crashes*

| | L | 2 | 3 | 4 | H | H-L |
|---|---|---|---|---|---|---|
| $\alpha_0$ | -0.0234*** | -0.0105** | -0.0071 | -0.0474** | -0.0259*** | 0.0025*** |
| | (-4.44) | (-2.46) | (-1.56) | (1.97) | (6.86) | (6.59) |
| $\alpha_\beta$ | -0.0543 | -0.0145 | -0.0089 | -0.0051 | -0.0118 | 0.0425* |
| | (-1.64) | (-0.88) | (-0.70) | (0.49) | (-0.23) | (1.78) |
| $\beta_0$ | 0.0588*** | 0.0706*** | 0.0696*** | 0.0598*** | 0.0680*** | 0.0092 |
| | (4.14) | (8.13) | (9.41) | (10.49) | (9.44) | (1.07) |
| $\beta_B$ | 0.0555 | 0.0395** | 0.0359** | 0.0290** | 0.0311* | -0.0244** |
| | (1.63) | (1.04) | (2.30) | (2.24) | (1.79) | (-1.98) |
| $\beta_{B,U}$ | -0.0087 | -0.0285 | -0.0029 | 0.0217 | 0.0289** | -0.0376*** |
| | (-0.02) | (-0.93) | (-1.22) | (-1.20) | (-2.20) | (-2.69) |

*This table presents these results of conditional regressions of the idiosyncratic momentum long-short (quintile) portfolios following Equation 5. The Newey & West [14] adjusting t-statistic (with a lag of 5) are reported in parentheses. * Significant at the 10% level; ** Significant at the 5% level; *** Significant at the 1% level.*

We find that the coefficient of market beta ($\beta_B$) is negative (-0.0244) and statistically significant (t-statistics =-1.98). It means that the difference in the market beta following bull and bear market is statistically significant. We also find that the $\beta_{B,U}$, which is defined as the subsequent up- and down-market betas differ after such market, is negative (-0.0376) and significant at the conventional level. Therefore, this result suggest that IMOM cannot explained by the crash risk. This results is in line with the previous study in the developed market [2], as well as emerging market [8].

### *3.3. Idiosyncratic momentum and market states*

In this section, we examine the predicted power of the IMOM under the conditions of the market following Cooper, Gutierrez and Hameed [11]. Specifically, Up market is defined as the periods with positive 36-month market returns, while Down market is defined as the periods with negative 36-month market returns. In each month, we sort all stocks into quintiles equal-weighted portfolios based on the IMOM return following Up and Down market. Then, we estimate the mean monthly profits and associated t-statistics of the zero-investment portfolios of the IMOM portfolios. These results are presented in Table 4.

***Table 4.*** *Market states*

| | Up market | Down market | Up-Down |
|---|---|---|---|
| **Mean** | 0.0122*** | 0.0011 | 0.0111 |
| **t-statics** | (3.29) | (0.15) | (0.10) |

*This table presents the mean monthly profits and associated t-statistics of the zero-investment portfolios of the IMOM portfolios. The Newey & West [14] adjusting t-statistic (with a lag of 5) are reported in parentheses. * Significant at the 10% level; ** Significant at the 5% level; *** Significant at the 1% level.*

From Table 4 results, we can see that the IMOM returns is positive (0.0122) and significant at 1% level in the UP market, while the IMOM returns is positive (0.0011) and insignificant (t-statistics = 0.15) in the DOWN market. The difference between UP and DOWN market is positive (0.0111) and insignificant (t-statistics = 0.10). This result suggest that the state of the market is critically important to the profitability of IMOM strategies. The finding that IMOM is driven by the state of the market seems related to the recently evidence from previous study such as the findings of Blitz, Hanauer and Vidojevic [2] in the US market. In fact, our finding is in line with the finding of Blitz, Hanauer and Vidojevic [2], the IMOM returns are significantly positive in Up market status and insignificantly positive in Down market status, as well as the difference between Up and Down market status is statistically insignificant.

## 4. Conclusions

In this study, we have demonstrated that there is a strongly positive cross-sectional relation between idiosyncratic momentum, measured as the return of stocks during the period covering months t − 36 through t – 1 using the Fama and French (1993) three-factor model, and future return in the Vietnam stock market. The empirical results indicate that, comparing to conventional momentum, idiosyncratic momentum can generate superior return. We also can see that the idiosyncratic momentum is not subsumed by the crash risk. However, the idiosyncratic momentum strategy is substantially affected by market dynamics, where if the return in the month following a down or up is taken into account. Our findings delivers a useful out-of-sample test on the pervasiveness of the idiosyncratic momentum effect across markets. Overall our study contributes to the literature on the cross-section of stock returns in emerging markets by providing evidence of the IMOM anomalies effect.

**Acknowledgements:**

We thank the editor and anonymous referees for comments and suggestions.

This research is funded by Funds for Science and Technology Development of the University of Danang under project number B2020-DN04-37.

## REFERENCE

[1] Blitz, D., Huij, J., & Martens, M., "Residual momentum", *Journal of Empirical Finance*, 18(3), 2011, 506–21.

[2] Blitz, D., Hanauer, M.X., & Vidojevic, M., "The idiosyncratic momentum anomaly", *International Review of Economics & Finance*, 69(C), 2020, 932-957.

[3] Fama, E. F., & MacBeth, J. D, "Risk, return and equilibrium: Empirical tests", *Journal of Political Economy*, 81(3), 1973, 607–636.

[4] Jegadeesh, N., & Titman, S., "Returns to buying winners and selling losers: Implications for stock market efficiency", *The Journal of Finance*, 48(1), 1993, 65-91

[5] Asness, C.S., Moskowitz, T.J. & Pedersen, L.H., "Value and momentum everywhere", *The journal of finance*, 68(3), 2013, 929-985.

[6] Jostova, G., Nikolova, S., Philipov, A., & Stahel, C. W., “Momentum in Corporate Bond Returns”, *The Review of Financial Studies*, 26(7), 2013, 1649–1693.

[7] Chang, R.P., Ko, K.-C., Nakano, S., & Rhee, S.G., “Residual momentum in Japan”, *Journal of Empirical Finance*, 45(C), 2018, 283-299.

[8] Qi Lin, “Residual Momentum and the Cross-Section of Stock Returns: Chinese Evidence”, *Finance Research Letters*, 29, 2018, 206-215.

[9] Chiao, C.S., Hsiao, Y.J., Chen, J.C., & An, N.M., “Residual momentum versus price momentum: Evidence from four Asian markets”, *Asia-Pacific Journal of Accounting & Economics*, 27(6), 2018, 717-726.

[10] Daniel, K., & Moskowitz, T. J., “Momentum crashes”, *Journal of Financial Economics*, 122(2), 2016, 221–247.

[11] Cooper, M.J., Gutierrez, R.C. & Hameed, A., “Market states and momentum”, *The Journal of Finance*, 59(3), 2004, 1345-1365.

[12] Dimson, E., P. Marsh, & Staunton, M., “Equity Premia Around the World”, 2011, Available at SSRN: https://ssrn.com/abstract=1940165.

[13] Fama, E. F., & French, K. R., “Common risk factors in the returns on stocks and bonds”, *Journal of Financial Economics*, 33(1), 1993, 3–56.

[14] Fama, E. F., & French, K. R., “A five-factor asset pricing model”, *Journal of Financial Economics*, 116(1), 2015, 1-22.

[15] Newey, W., & West, K, “A simple, positive semi-definite, heteroscedasticity and autocorrelation consistent covariance matrix”, *Econometrica*, 55(3), 1987, 703-708.

[16] Gibbons, M.R., Ross, S.A. & Shanken, J., “A test of the efficiency of a given portfolio”, *Econometrica*, 57(5), 1989, 1121-1152.

[17] Fama, E. F., & French, K. R., “Dissecting Anomalies”, *Journal of Finance*, 63(4), 2008, 1653-1678.

## APPENDIX A: SUMMARY STATISTIC

*The table shows summary descriptive statistics for the variables employed in this paper, as follows. IMOM is idiosyncratic momentum. BETA is the firm beta. SIZE is the log firm market capitalization. BM is the book-to-market ratio. MOM is the cumulative return from the start of month t-7 to the end of month t-2. OP is Operating profitability. INV is Investment. Summary statistics include the average value and standard deviation of each variable in the first two rows and the correlations between all variables in the remaining rows.*

| | **IMOM** | **BETA** | **SIZE** | **BM** | **MOM** | **OP** | **INV** |
|---|---|---|---|---|---|---|---|
| **MEAN** | 0.003 | 0.787 | 12.013 | 13.907 | 0.041 | 0.128 | 0.141 |
| **STD** | 0.991 | 0.902 | 1.791 | 0.690 | 0.357 | 4.262 | 0.470 |
| | | | | | | | |
| IMOM | 1 | | | | | | |
| BETA | 0.007 | 1 | | | | | |
| SIZE | -0.062 | 0.069 | 1 | | | | |
| BM | 0.077 | 0.008 | -0.530 | 1 | | | |
| MOM | 0.325 | -0.006 | 0.028 | -0.072 | 1 | | |
| OP | -0.006 | -0.017 | -0.054 | -0.052 | 0.014 | 1 | |
| INV | -0.038 | 0.024 | 0.166 | -0.154 | 0.000 | 0.013 | 1 |