Do Momentum and Reversal Matter in the Singapore Stock Market?

Abstract

This paper shows the presence of positive momentum return in the short run but no subsequent price reversal in the Singapore Market. Rather price momentum continues in the long run. It also demonstrates that momentum profit is higher for the small and highly volatile firms rather than the large stable firms. Both portfolio level and firm-level cross-sectional analyses are used to show the relationships.

Keywords: Momentum, Reversal, Singapore Stock Market

1. Introduction:

Many past works of literature demonstrate that buying winners and selling losers in the short-run (3 to 6 months) can a generate a positive return in many different markets which is called momentum strategy and the same equally important price pattern is reversal when prices reverse after a long run (3 to 4 years). Though there are many pieces of evidence of positive momentum return, there are very few kinds of literature that demonstrate both short-run momentum and long-run reversal strategy together. Recently, Blackburn and Cakici (2017) establish a global presence of both short-run momentum and long-run reversal into the regions of North America, Europe, Japan, and Asia, over 1993–2014. However, here I show that in the Singapore market, the short-run momentum strategy is giving positive profit, but the long-run price reversal is not evident here.

In this paper, the findings in the Singapore market are remarkably different from the evidence in the US and many other developed countries over the world. For example, Blackburn et al. (2017) show a significant positive momentum effect in the short run but a significant price reversal exists in the long run among twenty-three developed countries from North America, Europe, and Asia. They demonstrate that this price reversal is evident after three to five years. In contrast to this global evidence, this paper illustrates that a small integrated market like Singapore shows no price reversal in the long run rather momentum continues after three years. Moreover, several theories show the link between price momentum with price reversals, but there is a lack of evidence that connects short-run price momentum with the long-run price reversal. Hence this paper establishes the fact that generalizing all markets with the same momentum-reversal pattern could be misleading.

Momentum profit is one of the most puzzling and widely studied topics in the recent finance literature. Conrad and Yavuz (2016) show that there is no universal relation between short-term momentum and long-run reversal. They demonstrate that the portfolios that generate momentum profit in the short run do not exhibit reversal in the long run. In contrast, those portfolios that exhibit reversal in the short run continue to exhibit reversal in the long run. Jegadeesh and Titman (1993) report a significant positive return from buying the winner stocks and selling the loser stocks in the US market. Although many other studies find that the opposite strategy (selling the winner stocks and buying loser ones) can generate profit which is called contrarian strategy (DeBondt and Thaler 1985, 1987; Baytas and Cakici 1999). This kind of puzzling contradictory outcome demands more research in this area. Moreover, country-wise research regarding momentum is important because each stock market has its unique setting which influences the investor's behavior in different ways, hence strategy can differ from market to market.

In this paper, I pick the Singapore market for the following reasons. First, unlike other markets, in SGX, buyers and sellers conduct their trading activity without the intermediation of designated market makers or specialists, implying that they only place a limit order and conduct an order-driven trading system. Second, short selling is not too much restricted in the SGX market. According to Gao and Leung (2017), momentum profit is adversely related to the short sales restrictions, and loser portfolios rather than winners determine this result in the Australian market. Finally, though Singapore is a major financial hub in the Asia Pacific region, research on its stock market is very limited and the SGX market is way behind in terms of transparency and governance compared to other neighboring countries like China, Malaysia, and South Korea. Hence more study is required to explore the pattern of this market.

Another group of literature focuses on the over or under reactions in investor's decisions regarding momentum and contrarian strategy. Since the firm-specific information does not always reflect on the market quickly, there is always room for over and under reactions. Daniel, Hirshleifer, and Subrahmanyam (1998) demonstrate a model that implies how investor's overconfidence induces them to take a biased investment decision. It also indicates that investors overreact to private information and underreact to public information which can create room for the momentum strategy. They demonstrate that a continuing overreaction can create positive return autocorrelations which followed by a long-run correction. Thus, short-run positive autocorrelations can be in line with long-run negative autocorrelations. In this paper, I show the momentum and reversal effects in the Singapore market which is influenced by the investor's over and under reaction.

In the Chinese market, Li, Qiu, and Wu (2010) show that momentum strategy produces an insignificant positive return or even a few cases of negative returns while in the US market momentum strategies are producing positive returns documented by many works of literature. The negative results are strongest for the intermediate-term holding period (3 to 6 months) than the other cases. Griffin at el (2003) show that momentum profit is driven by country-specific risk and microeconomics risk has no significant relationship with momentum premium. In line with the US evidence, the Singapore market generates a positive return with the momentum strategy.

2. Literature Review

It is surprising why a price pattern like momentum persists in many stock markets all over the world. Several works of literature showing different kinds of behavioral biases find out the possible reasons for these price patterns. Barberis et al. (1998), as well as Hong and Stein (1999), try to explain it by investor's overconfidence and they claim that investor's inclination towards

public and private signals is responsible for these biases. Joseph D. Vu (2012) shows the momentum strategy's implication in emerging markets by using a random walk model. However recent works of literature are not supported of this idea. Grundy and Martin (2001) indicate that the momentum return can be explained by the factor model, but mean returns are not explained in their paper.

Underreaction may be another reason for momentum. Brav and Heaton (2002) indicate that the uncertainty about economic constraints and the lack of information to find the predicted price pattern is responsible for underreaction. Conrad and Kaul (1998) specify that the cross-sectional variance of unconditional mean returns can explain momentum profitability. Hong and Stain (2007) state that investors use overly simplified models that cannot predict the future return properly. For example, investors may contemplate that stock returns are simple functions of few macro variables, which are not always true. Rather they indicate that more realistic complex models needed to reduce forecast error. Persistent forecast error may be a source of momentum.

Abramov, Chordia, Jostova, and Philipov (2007) relate momentum with credit rating score. They indicate that low-grade firms have large momentum profitability whereas large firms cannot generate momentum gains. Hence momentum profit varies upon firm size, firm age, analyst forecast variation, return and cash flow volatility. Chordia and Shivakumar (2002) show that momentum payoffs are low during the recession but high during those recovery periods. That means they try to relate momentum with business conditions. Walkshäusl, Weibofner, and Wessels (2019) try to separate momentum from reversal. They check Conrad and Yavuz (2017)'s findings that momentum stocks can be separated from those that exhibit reversal by using characteristics like firm BM ratio and size. Nnadi and Tanna (2019) examine the momentum and contrarian strategies of BRICS countries and find that Indian stock market have the highet momentum effect.

Lee and Swaminathan (2000) specify that momentum and reversals can be explained by trading volume. Lo and MacKinlay (1990) indicate that past price pattern contains information regarding the stocks, and it influences investors to make a biased decision. They also claim that overreaction is responsible for this momentum phenomenon which is linked with the efficient market hypothesis. Conrad and Yavuz (2017) provide evidence that the stocks that experiencing momentum profit do not show a reversal in the long run. They argue that short-run momentum is a separate phenomenon than long-run reversal. They show that 6-month momentum stocks do not reverse in the long run. Kang, Liu and Ni (2002) also demonstrate both short-term contrarian and intermediate-term momentum strategies is the Chinise marker.

Lewellen (2019) shows the momentum return by using all NYSE, AMEX, and Nasdaq common stocks in the light of industry, size, book-to-market factors as well as size and book market portfolios. Lewellen mentions that these factors are adversely autocorrelated and cross-serially correlated over intermediate horizons. Grinblatt et al. (2004) show that consistent positive return is important for better momentum profit. They claim that investors have a habit of holding on their losing stocks (consistent with prospect theory) which creates a further gap between stock's fundamental values and market price. They show the portfolio return rises monotonically with the firm's capital gains.

Bondt and Thater (1987) trace a systematic reversal of those stocks which have a long run positive or negative trend. They argue that investors tend to act excessively with current information and ignore the base rate data. Conrad and Yavuz (2017) demonstrate that investors keep momentum within the 0 to 6 months period but reverse their investment pattern in the 12 to 24-month interval. Hence in the short-run momentum profit is relevant but in the long run, the

price may reverse. However, they demonstrate that momentum and reversal are separate phenomena and they are not linked with each other.

3. Data and Methodology

In this paper, I use a total of 986 Singapore firms (both active and dead) daily data from January 1992 to January 2018 from the Compustat database. The Fama French factor is downloaded from the Dartmouth webpage (http://mba.tuck.dartmouth.edu). Here, I use two frameworks that are widely used in many asset pricing kinds of literature. One is portfolio-level analysis and the other one is the firm-level cross-sectional analysis. These two frameworks are used in many significant momentum related papers like Blackburn et al (2017), Cheema et al (2017), McLean (2010), Bali et al (2011), etc. Different momentum strategies and their profits are reported by portfolio-level analysis is the most popular way to show the momentum effect in different markets. These kinds of portfolio-level analysis are used in almost all momentum related papers. However, the firm-level cross-sectional analysis (Fama-Macbeth) is also used in many momentum-related asset pricing kinds of literature. This framework has some advantages over the portfolio level analysis. First, an unbalanced panel can be easily handled by Fama-Macbeth. Second, related controls can be imposed in firm-level cross-sectional analysis. Third, this analysis is flexible in time-varying betas and finally, autocorrelation problems can be easily minimized by Newey–West corrections. (see Amit Goyal 2012)

Using the daily stock return, we calculate the following variables:

stock return ($return_{i,t}$), short-run momentum (MOM), long-term reversal ($REV_{i,t}$), skewnewss ($SKEW_{i,t}$), market beta ($BETA_{i,t}$), and illiquidity($ILLIQ_{i,t}$). $return_{i,t}$ is the average of daily stock returns for firm i during the month of t.

We calculate the momentum variable $MOM\_3_{i,t}$ as the cumulative return of stock i for 3 months over the period from $t-1$ to $t-3$, variable $MOM\_6_{i,t}$ as the cumulative return of stock i for 6 months over the period from $t-1$ to $t-6$, and three-year historic cumulative return $REV_{i,t}$ as the cumulative return of stock i for 36 months over the period from $t-1$ to $t-36$. $SKEW_{i,t}$ is calculated as the skewness of daily stock return of firm i during the month $t-1$. $SIZE_{i,t}$ is calculated by the natural logarithm of the market value of the equity of stock i in month $t-1$, and Illiquidity($ILLIQ_{i,t}$) is the absolute daily average stock return over a month divided by its trading volume of stock i in month $t-1$. Table 1 shows the summary statistics of the Singapore market stock return and other related variables.

[Insert Table 1 here]

We use the market model and Fama French three-factor model in equations (1 and 2) to estimate the systematic risk ($beta_{i,t}$) and idiosyncratic volatility ($ivol_{i,t}$).

$$R_{i,d} - r_{f,d} = \alpha_i + \beta_i(R_{m,d} - r_{f,d}) + e_{i,d} \quad (1)$$

Specifically, we use the daily stock returns of month $t-1$ to estimate the equation and then calculate the market BETA of stock *we* in month *t* ($\widehat{\beta_i}$) and the idiosyncratic volatility of stock *we* in month *t* is $ivol = \sqrt{var(e_{id})}$. To calculate three factors alpha, we use.

$$R_{i,d} - r_{f,d} = \alpha_i + \beta_{1i}(R_{m,d} - r_{f,d}) + \beta_{2i}SMB + \beta_{3i}HML + e_{i,d} \quad (2)$$

In this paper, I use both portfolio level and firm-level cross-section regression analysis to show the relationship. Since the functional form is not imposed on the relation between MAX and future returns in the case of portfolio-level analysis, it has the advantage of being nonparametric (Bali et. al 2011). However, in cross-sectional Fama-Macbeth regression, all related controls can be used.

4. Results

4.1 Univariate sort

Table 2 demonstrates the short-run momentum portfolios in panel A and B and long-run reversal portfolios in panel C. In panels A and B, the two extreme portfolio differences and three-factor alpha differences clearly indicate a positive momentum profit in both value and equal-weighted cases. However, in the Singapore market, the reversal is not evident in the long run rather we find that the return and three-factor alpha difference are positive like momentum portfolios. This indicates that the short-run upward movement of stocks is continuing in the long run too. To be consistent with long-term reversals, the return and two-factor alpha difference between two extreme portfolios should be negative and significant. Moreover, to establish that the return difference is not just compensation for risk, alpha should also be negative and significant. In contrast with long-term reversals, the return and alpha difference of the univariate portfolio sorts demonstrate a significant positive difference in returns between winners and losers when using both equal and value-weighted portfolios.

[Insert Table 2 here]

In table 2 we see that in MOM_3 sorting, the three-factor alpha difference is 0.07122 with a t stat of 2.463 for equal-weighted portfolios and 0.004199 with a t stat of 2.017 for value-weighted portfolios. In MOM_6 sorting, the three-factor alpha difference is 0.07423 when the associated t stat is 2.063 for equal-weighted portfolios and 0.00186 when t stat is 0.571 for value-weighted portfolios. Hence the results are positive and significant in most the cases meaning that momentum profit is possible in this market. Blackburn and Cakici (2017) demonstrate a universal presence of long-run price reversals, meaning the winner (highest values of REV) minus loser

(highest values of REV) return differentials and alpha differences are negative and significant. Opposed to this result, our finding demonstrates a positive return and alpha differences in the Singapore market.

Tables 3 and 4 demonstrate the same univariate sort with longer holding periods. Consistent with a short holding period, the difference in returns between the winner portfolio and the loser portfolio is positive and significant. In the case of the long holding period, we even find that the momentum effect is larger than the short holding period. Jegadeesh (1990) and Lehmann (1990) mentioned that losers over the past one month outperform winners over the next one month. In contrast with Jegadeesh (1990) and Lehmann (1990), our finding shows that the winner outperforms loser in both short, intermediate and long-term horizons. In line with our findings, Doan and Alexeev (2014) show that from 1992 to 2011, the Australian market does not show the long-run inclination toward reversal of trends which has been documented in other developed markets.

[Insert Tables 3 and 4 here]

4.2 Bivariate sort

In this section, I study the relation between momentum and future returns after controlling for idiosyncratic volatility, market beta, reversal, illiquidity, and book to market value. For example, first I sort portfolios by using IVOL and then, within each IVOL quintile, I sort stocks into quintile portfolios again ranked based on short-run momentum and long-run reversal so that quintile1 (quintile 5) contains stocks with the lowest (highest) MOM and REV.

[Insert tables 5, 6 and 7 here]

Though evidence of short-run momentum and a long-run reversal is a global phenomenon, there is no evidence of long-run price reversal in the Singapore market. Barberis et al. (1998) and Daniel et al. (1998) indicate behavioral models related to the short-run momentum and long-run reversal. They argue that investors overreact by the new information in the short run but after a certain period (in the long run) they realize and try to correct the mistake they did in the past. The reversal occurs when these investors perceive that stock price is far from its fundamentals and they try to readjust to bring it close to the fundamental price. Conrad et al. (1998) indicate that selling short term losers and buying short term winners is comparable to purchasing stocks with high expected returns and selling stocks with low expected returns. In tables 5 and 6, we see that the return differences are positive and significant in most of the cases, meaning that momentum profit is possible in the Singapore market and this result is in line with the global trend. However, in contrast to the global trend, the return differences of two extreme portfolios are positive in case of reversal meaning that the short-run momentum continues in the long run in Table 7 without any price reversal in this market.

4.3 Firm-level cross-sectional regression

Firm-level cross-sectional analysis has some advantages over the portfolio level analysis. First, an unbalanced panel can be easily managed by Fama-Macbeth regression. Second, relevant controls can be used in firm-level cross-sectional analysis. Third, this framework can be used in time-varying betas and finally, we can minimize autocorrelation problems by using Newey–West corrections. (see Amit Goyal 2012). Hence firm-level cross-sectional analysis is important to find out the exact momentum and reversal effects in the Singapore market. Following Bali et al. (2011), in each month, I estimate momentum and reversal by using the equations (3, 4 and 5). In tables 8, 9, and 10, I report the time-series averages of the cross-sectional regression coefficients estimated

in each month and their associated *t*-statistics in parentheses based on Newey-West (1987) heteroscedasticity and autocorrelation consistent (HAC) standard errors.

$$R_{i,t} = \gamma_{0,t} + \gamma_{t,1} MOM\_3_{\ i,t} + \gamma_{t,2} BETA_{i,t} + \gamma_{t,3} BM_{i,t} + \gamma_{t,4} SIZE_{i,t} + \gamma_{t,5} ILLIQ_{i,t} + \gamma_{t,6} SKEW_{i,t} + \varepsilon_{i,t+1} \quad (3)$$

$$R_{i,t} = \gamma_{0,t} + \gamma_{t,1} MOM\_6_{\ i,t} + \gamma_{t,2} BETA_{i,t} + \gamma_{t,3} BM_{i,t} + \gamma_{t,4} SIZE_{i,t} + \gamma_{t,5} ILLIQ_{i,t} + \gamma_{t,6} SKEW_{i,t} + \varepsilon_{i,t+1} \quad (4)$$

$$R_{i,t} = \gamma_{0,t} + \gamma_{t,1} REV_{\ i,t} + \gamma_{t,2} BETA_{i,t} + \gamma_{t,3} BM_{i,t} + \gamma_{t,4} SIZE_{i,t} + \gamma_{t,5} ILLIQ_{i,t} + \gamma_{t,6} SKEW_{i,t} + \varepsilon_{i,t+1} \quad (5)$$

[Insert tables 8, 9 and 10 here]

From tables 8,9 and 10, I find that all momentum and reversal coefficients are positive and significant. That means consistent with portfolio-level analysis the firm-level cross-sectional analysis shows short-run momentum effects, but the price is not reverse in the long run. Despite the empirical evidence of the global presence of reversal reported by many researchers, this paper show that there is no evidence of long-run price reversal in the Singapore market. Rather price even continues to rise further in the long run. The global findings of significant long-run reversal indicate a weak-form of market efficiency and evidence of overreaction or underreaction in the short run. The nonexistence of price reversal in the Singapore market maybe because the

momentum in the stock price may be due to the increment of the fundamental stock values rather than the overreaction or underreaction in the Singapore market.

4.4 Subsample Analysis (Small Vs large firms)

In this section, I regress a series of regression by shorting stocks in small and large firm groups. The median value of the SIZE variable is used to sort stocks into small and large subsamples. SIZE is one of the major factors that can affect momentum effects. Cakici, Fabozzi and Tan (2013) examine value and momentum effects on 18 emerging market's stock prices. They use January 1990 to December 2011 data to find the evidence of size pattern in the price momentum for many emerging markets. This paper shows that in the Singapore market, small firms are generating greater momentum profit than large firms.

[Insert Table 11 here]

Table 11 clearly designates that small firms have a significant momentum effect, but it is not significant in the case of large firms. Reversal is not evident in both small and large sample firms in the Singapore market. Alhenawi (2013) shows the interaction between the size effect and the momentum effect in the cross-section. He demonstrates that momentum absorbs the size effect. Siganos (2007) constructs three portfolios (small, medium and large) and after that, within each size, he checks the sub-samples performance regarding momentum returns. He finds that investment that buys and sells short a relatively small number of shares generates a high level of momentum returns, on the other hand, the opposite investment strategies that buy and sell a relatively large number of shares tend to generate a low level of gains.

4.5 Subsample Analysis (High IVOL vs Low IVOL firms)

Momentum profit can be explained by Idiosyncratic volatility demonstrated by many kinds of literature. Arena, Haggard, and Yan (2008) show that momentum profit is strong among high idiosyncratic volatility stocks, especially high IVOL losers. They use the data of the US stocks within the year of 1965 to 2002 and show that the momentum effect is greater for the high IVOL stocks. They also show that these stocks display quicker and rapid reversal. Wang and Xu (2014) demonstrate the predictability of market volatility on price momentum. They find that market volatility can explain momentum payoffs significantly even after controlling for business cycles and market states. Pyo and Shin (2012) state that Momentum profits are greater among high IVOL stocks, especially high IVOL winners in the South Korean market. They also demonstrate that the effect of idiosyncratic volatility on momentum gains is positive by using the time-series relationship between momentum returns and aggregate IVOL.

[Insert Table 12 here]

Consistent with these previous findings, Table 12 demonstrates the same positive relationship between high IVOL and momentum gains in the Singapore market. In all high IVOL firms' cases, the momentum coefficients are highly significant. The reversal (REV) coefficient is also positive and significant, meaning that there are no traces of price reversal even in the case of high IVOL firms in the long run. The relation between IVOL and momentum in the US market is mixed. Cheema and Nartea (2017) show that there is no relationship between idiosyncratic volatility and momentum in the Chinese market, which is in line with the view that IVOL is not an arbitrage cost for momentum return. However, in the Singapore market, I find high IVOL firms have greater momentum, indicating a trace of overconfidence, underreaction or self-attribution associated with the investors' behavior. The regression results of the subsample analysis of recent years from 2000 to 2018 and 2008 to 2018 are reported in the Appendix section of this article.

5. Conclusion

This article establishes solid evidence that the Singapore market has strong price momentum in the short run but in the long run, there is no trace of price reversal. It also demonstrates that small highly volatile firms have higher momentum profit than the large stable firms. Consistent with Sagi and Seasholes (2007), this article also validates the fact that momentum profit is highly related to firm-specific attributes. Sagi and Seasholes (2007) show that momentum profit is greater in the high revenue volatility firms and low-cost firms. Much recent evidence shows that the functional relation between the firm value is an important factor of conditional expected returns. This paper offers fresh evidence of existing momentum profit theories as well as how momentum profit links with firm-specific risk and firm size.

References

Alhenawi, Y. (2015). On the interaction between momentum effect and size effect. *Review of Financial Economics*, *26*, 36-46.

Arena, M. P., Haggard, K. S., & Yan, X. (2008). Price momentum and idiosyncratic volatility. *Financial Review*, *43*(2), 159-190.

Bali, T. G., Cakici, N., & Whitelaw, R. F. (2011). Maxing out: Stocks as lotteries and the cross-section of expected returns. *Journal of Financial Economics*, *99*(2), 427-446.

Barberis, N., Shleifer, A., & Vishny, R. (1998). A model of investor sentiment. *Journal of financial economics*, *49*(3), 307-343.

Baytas, A., & Cakici, N. (1999). Do markets overreact: International evidence. *Journal of Banking & Finance*, *23*(7), 1121-1144.

Blackburn, D. W., & Cakici, N. (2017). Overreaction and the cross-section of returns: International evidence. *Journal of Empirical Finance*, *42*, 1-14.

Brav, A., & Heaton, J. B. (2002). Competing theories of financial anomalies. *The Review of Financial Studies*, *15*(2), 575-606.

Cakici, N., Fabozzi, F. J., & Tan, S. (2013). Size, value, and momentum in emerging market stock returns. *Emerging Markets Review*, *16*, 46-65.

Cheema, M. A., & Nartea, G. V. (2017). Momentum, idiosyncratic volatility and market dynamics: Evidence from China. *Pacific-Basin Finance Journal*, *46*, 109-123.

Chordia, T., & Shivakumar, L. (2002). Momentum, business cycle, and time-varying expected returns. *The Journal of Finance*, *57*(2), 985-1019.

Conrad, J., & Kaul, G. (1998). An anatomy of trading strategies. *The Review of Financial Studies*, *11*(3), 489-519.

Conrad, J., & Yavuz, M. D. (2017). Momentum and reversal: Does what goes up always come down?. *Review of Finance*, *21*(2), 555-581.

Daniel, K., Hirshleifer, D., & Subrahmanyam, A. (1998). Investor psychology and security market under-and overreactions. *the Journal of Finance*, *53*(6), 1839-1885.

De Bondt, W. F., & Thaler, R. H. (1987). Further evidence on investor overreaction and stock market seasonality. *The Journal of finance*, *42*(3), 557-581.

Doan, M. P., Alexeev, V., & Brooks, R. (2016). Concurrent momentum and contrarian strategies in the Australian stock market. *Australian Journal of Management*, *41*(1), 77-106.

Fama, E. F., & MacBeth, J. D. (1973). Risk, return, and equilibrium: Empirical tests. *Journal of political economy*, *81*(3), 607-636.

Gao, Y., & Leung, H. (2017). Impact of short selling restrictions on informed momentum trading: Australian evidence. *Pacific-Basin Finance Journal*, *45*, 103-115.

Goyal, A. (2012). Empirical cross-sectional asset pricing: a survey. *Financial Markets and Portfolio Management*, *26*(1), 3-38.

Griffin, J. M., Ji, X., & Martin, J. S. (2003). Momentum investing and business cycle risk: Evidence from pole to pole. *The Journal of Finance*, *58*(6), 2515-2547.

Grinblatt, M., & Moskowitz, T. J. (2004). Predicting stock price movements from past returns: The role of consistency and tax-loss selling. *Journal of Financial Economics*, *71*(3), 541-579.

Grundy, B. D., & Martin, J. S. M. (2001). Understanding the nature of the risks and the source of the rewards to momentum investing. *The Review of Financial Studies*, *14*(1), 29-78.

Hong, H., & Stein, J. C. (1999). A unified theory of underreaction, momentum trading, and overreaction in asset markets. *The Journal of finance*, *54*(6), 2143-2184.

Hong, H., & Stein, J. C. (2007). Disagreement and the stock market. *Journal of Economic perspectives*, *21*(2), 109-128.

Jegadeesh, N. (1990). Evidence of predictable behavior of security returns. *The Journal of finance*, *45*(3), 881-898.

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

Kang, J., Liu, M. H., & Ni, S. X. (2002). Contrarian and momentum strategies in the China stock market: 1993–2000. *Pacific-Basin Finance Journal*, *10*(3), 243-265.

Lee, C. M., & Swaminathan, B. (2000). Price momentum and trading volume. *the Journal of Finance*, *55*(5), 2017-2069.

Lewellen, T. (2019). *Peasants in transition: The changing economy of the Peruvian Aymara: A general systems approach*. Routledge.

Lehmann, B. N. (1990). Fads, martingales, and market efficiency. *The Quarterly Journal of Economics*, *105*(1), 1-28.

Li, B., Qiu, J., & Wu, Y. (2010). Momentum and seasonality in Chinese stock markets. *Journal of money, investment and banking*, *17*(5), 24-36.

Lo, A. W., & MacKinlay, A. C. (1990). When are contrarian profits due to stock market overreaction?. *The review of financial studies*, *3*(2), 175-205.

McLean, R. D. (2010). Idiosyncratic risk, long-term reversal, and momentum. *Journal of Financial and Quantitative Analysis*, *45*(4), 883-906.

Nnadi, M., & Tanna, S. (2019). Accounting analyses of momentum and contrarian strategies in emerging markets. *Asia-Pacific Journal of Accounting & Economics*, *26*(4), 457-477.

Naughton, T., Truong, C., & Veeraraghavan, M. (2008). Momentum strategies and stock returns: Chinese evidence. *Pacific-Basin Finance Journal*, *16*(4), 476-492.

Newey, W. K., & West, K. D. (1987). Hypothesis testing with efficient method of moments estimation. *International Economic Review*, 777-787.

Pyo, U., & Jae Shin, Y. (2013). Momentum profits and idiosyncratic volatility: the Korean evidence. *Review of Accounting and Finance*, *12*(2), 180-200.

Sagi, J. S., & Seasholes, M. S. (2007). Firm-specific attributes and the cross-section of momentum. *Journal of Financial Economics*, *84*(2), 389-434.

Siganos, A. (2007). Momentum returns and size of winner and loser portfolios. *Applied Financial Economics*, *17*(9), 701-708.

Vu, J. D. (2012). Do momentum strategies generate profits in emerging stock markets. *Problems and Perspectives in Management*, *10*(3), 9-22.

Walkshäusl, C., Weißofner, F., & Wessels, U. (2019). Separating momentum from reversal in international stock markets. *Journal of Asset Management*, *20*(2), 111-123.

Wang, K. Q., & Xu, J. (2015). Market volatility and momentum. *Journal of Empirical Finance*, *30*, 79-91.

Table 1: Summary statistics

	mean	sd	median
Return	0.06	3.43	0.00
MOM_3	0.18	6.02	.013
MOM_6	0.36	8.67	.03
REV	2.25	21.71	.00
BM	0.90	9.61	1
BETA	-5.60	23.10	0.57
ILLIQ	0.00	0.02	0.00
SIZE	18.57	1.76	18.32
SKEW	0.22	1.21	0.20

Note: This table shows summary statistics for the 986 firms of Singapore in the sample period from January 1992 to December 2017. the momentum variable $MOM\_3_{i,t}$ as the cumulative return of stock i for 3 months over the period from $t-1$ to $t-3$, variable $MOM\_6_{i,t}$ as the cumulative return of stock i for 3 months over the period from $t-1$ to $t-6$, the three-year historic cumulative return is $REV_{i,t}$ meaning the cumulative return of stock i for 36 months over the period from $t-1$ to $t-36$. $SKEW_{i,t}$ is calculated as the skewness of daily stock return of firm i during the month $t-1$. $SIZE_{i,t}$ is calculated by the natural logarithm of the market value of the equity of stock i in month $t-1$. Illiquidity($ILLIQ_{i,t}$) is the absolute daily average stock return over a month divided by its trading volume of stock i in month $t-1$.

Table 2: MOM_3, MOM_6_REV sorted Portfolio return

Panel A: Portfolio return based on MOM_3

Portfolios	EW	VW
	Avg. Return	Avg. Return
Loser	0.05863	0.00364
2	0.01622	0.00096
3	0.01812	0.00137
4	0.01638	0.00117
Winner	0.11840	0.00812
Diff 10-1	0.05977*	0.00448
t value	(1.801)	(1.637)
Three factor alpha Diff 10-1	0.07122**	0.004199*
t value	(2.463)	(2.017)

Panel B: Portfolio return based MOM_6

Portfolios	EW	VW
	Avg. Return	Avg. Return
Loser	0.05689	0.00515
2	0.01770	0.00099
3	0.01750	0.00123
4	0.01895	0.00163
Winner	0.01166	0.00624
Diff 10-1	0.05972	0.00110
t value	(1.644)	(0.342)
Three factor alpha Diff 10-1	0.07423*	0.00186
t value	(2.063)	(0.571)

Panel C: Portfolio return based on REV

Portfolios	EW	VW
	Avg. Return	Avg. Return
Loser	0.03007	0.00356
2	0.01668	0.00096
3	0.03500	0.00160
4	0.04738	0.00333
Winner	0.09887	0.00580
Diff 10-1	0.06880**	0.00224
t value	(2.260)	(0.824)
Three factor alpha Diff 10-1	0.06777***	0.00238
t value	(2.723)	(1.158)

Note: The results present the average return of the 5 portfolios of each month formed from January 1992 to July 2018 of 986 Singapore firms based on MOM_3 (three-month cumulative return measured over t-3 to t-1), MOM_6 (six-month cumulative return measured over t-6 to t-1) and REV (thirty six-month cumulative return measured over t-36 to t-1). The portfolios are reshuffled each month by assigning all stocks to 5 equal portfolios. The last two rows represents the return and three-factor alpha difference between two extreme portfolios. Returns are the average monthly return

Table 3: MOM_3, MOM_6_REV sorted Portfolio return with 2 month holding period

Panel A: Portfolio return based on MOM_3

Portfolios	EW	VW
	Avg. Return	Avg. Return
Loser	-0.00963	-0.00058
2	-0.00150	0.00013
3	0.02539	0.00178
4	0.05520	0.00396
Winner	0.76970	0.02655
Diff 10-1	0.77933***	0.02713***
t value	(5.375)	(6.105)
Three factor alpha Diff 10-1	0.78007***	0.02698***
t value	(5.298)	(6.601)

Panel B: Portfolio return based MOM_6

Portfolios	EW	VW
	Avg. Return	Avg. Return
Loser	0.01561	0.00240
2	0.00600	0.00014
3	0.02764	0.00199
4	0.05512	0.00423
Winner	0.73577	0.02303
Diff 10-1	0.72016***	0.02063***
t value	(4.894)	(4.288)
Three factor alpha Diff 10-1	0.72714***	0.02112***
t value	(4.809)	(4.389)

Panel C: Portfolio return based on REV

Portfolios	EW	VW
	Avg. Return	Avg. Return
Loser	0.02114	0.00341
2	0.01757	0.00098
3	0.04960	0.00313
4	0.10483	0.00701
Winner	0.64288	0.01713
Diff 10-1	0.62174***	0.01372***
t value	(4.311)	(3.119)
Three factor alpha Diff 10-1	0.61220***	0.01385***
t value	(4.170)	(3.406)

Note: The results present the average return of the 5 portfolios of each month formed from January 1992 to July 2018 of 986 Singapore firms based on MOM_3 (three-month cumulative return measured over t-3 to t-1), MOM_6 (six-month cumulative return measured over t-6 to t-1) and REV (thirty six-month cumulative return measured over t-36 to t-1) with two month holding periods. The portfolios are reshuffled each month by assigning all stocks to 5 equal portfolios. The last two rows represents the return and three-factor alpha difference between two extreme portfolios. Returns are the average monthly return

Table 4: MOM_3, MOM_6_REV sorted Portfolio return with 3 month holding period

Panel A: Portfolio return based on MOM_3

Portfolios	EW	VW
	Avg. Return	Avg. Return
Loser	-0.07892	-0.00421
2	-0.02100	-0.00077
3	0.03144	0.00244
4	0.09068	0.00657
Winner	.1139719	0.04663
Diff 10-1	.1147611*	0.05083***
t value	(2.287)	(8.727)
Three factor alpha Diff 10-1	.1089663*	0.050805***
t value	(2.102)	(9.079)

Panel B: Portfolio return based MOM_6

Portfolios	EW	VW
	Avg. Return	Avg. Return
Loser	-0.03158	0.00013
2	-0.00467	-0.00039
3	0.03625	0.00262
4	0.08781	0.00684
Winner	0.11349	0.04123
Diff 10-1	0.113812*	0.04109***
t value	(2.258)	(6.708)
Three factor alpha Diff 10-1	0.10811	0.04216***
t value	(2.076)	(6.770)

Panel C: Portfolio return based on REV

Portfolios	EW	VW
	Avg. Return	Avg. Return
Loser	0.01109	0.00350
2	0.01922	0.00111
3	0.07847	0.00422
4	0.19375	0.01050
Winner	0.110827	0.03058
Diff 10-1	0.110717*	0.02709***
t value	(2.208)	(4.689)
Three factor alpha Diff 10-1	0.104806*	0.02752***
t value	(2.023)	(4.920)

Note: The results present the average return of the 5 portfolios of each month formed from January 1992 to July 2018 of 986 Singapore firms based on MOM_3 (three-month cumulative return measured over t-3 to t-1), MOM_6 (six-month cumulative return measured over t-6 to t-1) and REV (thirty six-month cumulative return measured over t-36 to t-1) with three month holding periods. The portfolios are reshuffled each month by assigning all stocks to 5 equal portfolios. The last two rows represents the return and three-factor alpha difference between two extreme portfolios. Returns are the average monthly return

Table 5: Double sorted portfolios with MOM_3 and other variables

Panel A: Equal Weighted Portfolios					
Portfolios	IVOL	BETA	REV	ILLIQ	BM
Low MOM_3	0.014	0.062	0.038	0.039	0.028
2	0.011	0.042	0.017	0.036	0.017
3	0.013	0.018	0.022	0.070	0.027
4	0.048	0.013	0.047	0.033	0.031
High MOM_3	0.132	0.084	0.103	0.043	0.116
Diff 10-1	0.118***	0.023	0.065***	0.004	0.088**
	(5.784)	(1.068)	(2.972)	(0.285)	(2.703)
FF alpha	0.141***	0.035	0.072***	0.000	0.100**
	(6.279)	(1.669)	(3.452)	(0.000)	(2.753)
Panel B: Value Weighted Portfolios					
Portfolios	IVOL	BETA	REV	ILLIQ	BM
Low MOM_3	0.001	0.006	0.002	0.002	0.003
2	0.001	0.002	0.001	0.005	0.002
3	0.001	0.001	0.004	0.003	0.002
4	0.004	0.001	0.003	0.002	0.002
High MOM_3	0.009	0.006	0.004	0.004	0.007
Diff 10-1	0.008***	0.000	0.002**	0.002	0.003
	(4.796)	(0.050)	(2.222)	(1.622)	(0.963)
FF alpha	0.008***	0.000	0.002**	0.003*	0.002
	(4.922)	(0.163)	(2.688)	(1.877)	(0.713)

Note: The results present the average return of the 5 double sorted portfolios of each month formed from January 1992 to July 2018 of 986 Singapore firms based on MOM_3 (three-month cumulative return measured over t-3 to t-1) with other control variables. The portfolios are reshuffled each month by assigning all stocks to 5 equal portfolios. The last two rows represent the return and three-factor alpha difference between two extreme portfolios. Returns are the average monthly return

Table 6: Double sorted portfolios with MOM_6 and other variables

Panel A: Equal Weighted Portfolios

Portfolios	IVOL	BETA	REV	ILLIQ	BM
Low MOM_6	0.014	0.066	0.038	0.041	0.028
2	0.008	0.044	0.017	0.036	0.016
3	0.012	0.016	0.022	0.074	0.026
4	0.051	0.012	0.047	0.032	0.032
High MOM_6	0.143	0.090	0.103	0.045	0.126
Diff 10-1	0.130*** (5.751)	0.024 (1.069)	0.065*** (2.972)	0.004 (0.285)	0.098** (2.703)
FF alpha	0.141*** (6.245)	0.036 (1.663)	0.072*** (3.452)	0.000 (-0.008)	0.100** (2.753)

Panel B: Value Weighted Portfolios

Portfolios	IVOL	BETA	REV	ILLIQ	BM
Low MOM_6	0.001	0.006	0.002	0.002	0.002
2	0.001	0.002	0.001	0.005	0.002
3	0.001	0.001	0.004	0.003	0.001
4	0.004	0.001	0.003	0.002	0.001
High MOM_6	0.009	0.006	0.004	0.004	0.009
Diff 10-1	0.008*** (4.773)	0.000 (0.050)	0.002** (2.222)	0.002 (1.622)	0.007* (2.121)
FF alpha	0.008*** (4.893)	0.000 (0.163)	0.002** (2.688)	0.003 (1.877)	0.006 (1.843)

Note: The results present the average return of the 5 double sorted portfolios of each month formed from January 1992 to July 2018 of 986 Singapore firms based on MOM_6 (six-month cumulative return measured over t-6 to t-1) with other control variables. The portfolios are reshuffled each month by assigning all stocks to 5 equal portfolios. The last two row represents the return and three-factor alpha difference between two extreme portfolios. Returns are the average monthly return

Table 7: Double sorted portfolios with REV and other variables

Panel A: Equal Weighted Portfolios					
Portfolios	IVOL	BETA	MOM	ILLIQ	BM
Low REV	0.014	0.036	0.059	0.041	0.028
2	0.008	0.024	0.016	0.036	0.016
3	0.012	0.058	0.018	0.074	0.026
4	0.051	0.080	0.017	0.032	0.032
High REV	0.143	0.030	0.118	0.045	0.126
Diff 10-1	0.130*** (5.752)	-0.006 (-0.539)	0.060* (1.797)	0.004 (0.285)	0.098** (2.703)
FF alpha	0.141*** (6.245)	-0.005 (-0.570)	0.071** (2.459)	0.000 (-0.008)	0.100** (2.753)
Panel B: Value Weighted Portfolios					
Portfolios	IVOL	BETA	MOM	ILLIQ	BM
Low REV	0.001	0.006	0.004	0.002	0.003
2	0.001	0.002	0.001	0.005	0.002
3	0.001	0.001	0.001	0.003	0.002
4	0.004	0.001	0.001	0.002	0.002
High REV	0.009	0.006	0.008	0.004	0.007
Diff 10-1	0.008*** (4.785)	0.000 (0.050)	0.004 (1.601)	0.002 (1.622)	0.003 (0.963)
FF alpha	0.008*** (4.907)	0.000 (0.163)	0.004* (1.973)	0.003 (1.877)	0.002 (0.713)

Note: The results present the average return of the 5 double sorted portfolios of each month formed from January 1992 to July 2018 of 986 Singapore firms based on REV (thirty six-month cumulative return measured over t-36 to t-1) with other control variables. The portfolios are reshuffled each month by assigning all stocks to 5 equal portfolios. The last two rows represents the return and three-factor alpha difference between two extreme portfolios. Returns are the average monthly return

Table 8: Firm Level Cross Sectional Regression with mom_3 as a Main Regressor

Panel A: Equal Weighted Regression

INTERCEPT	MOM_3	BETA	BM	SIZE	ILLIQ	SKEW
.035**	.064*					
(2.03)	(1.96)					
0.036**	0.067*	-0.001				
(2.05)	(1.98)	(-1.57)				
0.031*	0.064*		0.004			
(1.90)	(1.96)		(1.72)			
0.318**	0.062*			-0.015**		
(2.14)	(1.94)			(-2.16)		
.035**	0.063*				0.513	
(2.01)	(1.99)				(1.50)	
.034*	0.067**					0.000
(1.93)	(2.09)					(0.13)
.338*	0.065**	0.000	-0.003**	-0.016*	0.677	-0.001
(2.00)	(2.10)	(-0.01)	(-2.19)	(-2.00)	(0.34)	(-0.17)

Panel B: Value Weighted Regression

INTERCEPT	MOM_3	BETA	BM	SIZE	ILLIQ	SKEW
0.003*	0.034**					
(1.99)	(2.28)					
0.006**	0.040***	-0.002**				
(2.44)	(2.88)	(-2.40)				
0.005**	0.034**		-0.001*			
(2.58)	(2.28)		(-2.06)			
0.099**	0.032**			-0.004**		
(2.84)	(2.32)			(-2.88)		
0.003*	0.033**				0.637	
(2.03)	(2.19)				(1.60)	
0.003*	0.035**					0.003*
(1.94)	(2.58)					(1.77)
0.090*	0.038***	-0.002***	-0.001	-0.004*	0.516	0.002
(2.18)	(2.92)	(-3.34)	(-1.84)	(-2.08)	(1.90)	(1.39)

Note: This table reports the monthly firm-level cross-sectional regression slope coefficients and their associated Newey-West (1987) adjusted t-statistics for the equation (3) of 986 Singapore firms for the period from Jan-1992 to Jan-2018. We regress the monthly stock return on a set of lag explanatory variable that short-run momentum (MOM_3), market beta (BETA), book to market ratio (BM), firm size (SIZE), illiquidity (ILLQ), skewness (SKEW)

Table 9: Firm Level Cross Sectional Regression with mom_6 as a Main Regressor

Panel A: Equal Weighted Regression

INTERCEPT	MOM_6	BETA	BM	SIZE	ILLIQ	SKEW
0.033*	0.028*					
(1.97)	(1.84)					
0.035*	0.028*	-0.001*				
(1.99)	(2.04)	(-1.87)				
0.029	0.028*		0.004*			
(1.78)	(1.84)		(1.93)			
0.324**	0.027*			-0.016*		
(2.16)	(1.88)			(-2.18)		
0.033*	0.026*				0.784	
(1.94)	(1.81)				(1.64)	
0.032*	0.030**					0.000
(1.85)	(2.11)					(0.01)
0.342*	0.028**	0.000	-0.005*	-0.016*	0.206	-0.001
(2.00)	(2.27)	(0.17)	(-2.11)	(-2.00)	(0.91)	(-0.54)

Panel B: Value Weighted Regression

INTERCEPT	MOM_6	BETA	BM	SIZE	ILLIQ	SKEW
.001	.002					
(0.52)	(0.63)					
0.004	0.005	-0.001				
(1.16)	(0.99)	(-1.09)				
0.002	0.003		-0.001*			
(0.92)	(0.64)		(-2.04)			
0.094**	0.000			-0.004**		
(2.57)	(0.06)			(-2.67)		
0.001	0.003				0.400	
(0.58)	(0.58)				(1.21)	
0.000	0.001					0.005*
(0.00)	(0.26)					(2.55)
0.083	0.002	-0.001	-0.001	-0.004	0.244	0.004
(1.89)	(0.34)	(-1.38)	(-1.82)	(-1.88)	(1.91)	(2.17)

Note: This table reports the monthly firm-level cross-sectional regression slope coefficients and their associated Newey-West (1987) adjusted t-statistics for the equation (4) of 986 Singapore firms for the period from Jan-1992 to Jan-2018. We regress the monthly stock return on a set of lag explanatory variable that short-run momentum (MOM_6), market beta (BETA), book to market ratio (BM), firm size (SIZE), illiquidity (ILLQ), skewness (SKEW)

Table 10: Firm Level Cross Sectional Regression with REV as a Main Regressor

Panel A: Equal Weighted Regression

INTERCEPT	REV	BETA	BM	SIZE	ILLIQ	SKEW
0.028	0.011*					
(1.53)	(1.93)					
0.029	0.010*	-0.001				
(1.51)	(1.92)	(-0.88)				
0.025	0.011*		0.003			
(1.39)	(1.93)		(1.68)			
0.338	0.011*			-0.017		
(1.77)	(1.93)			(-1.80)		
0.025	0.010				0.325	
(1.50)	(1.89)				(1.51)	
0.028	0.011*					0.000
(1.51)	(1.98)					(-0.06)
0.332	0.011*	0.000	-0.004	-0.016	1.543	-0.003
(1.71)	(1.98)	(0.54)	(-2.14)	(-1.72)	(1.53)	(-1.48)

Panel B: Value Weighted Regression

INTERCEPT	REV	BETA	BM	SIZE	ILLIQ	SKEW
0.002	0.007***					
(0.98)	(3.03)					
0.003	0.008***	-0.002**				
(1.55)	(3.45)	(-2.99)				
0.002	0.007***		-0.001			
(1.38)	(3.03)		(-1.59)			
0.059	0.007**			-0.003*		
(2.11)	(2.96)			(-2.13)		
0.002	0.006**				0.117	
(1.05)	(2.73)				(1.54)	
0.002	0.008					0.001
(0.94)	(3.55)					(0.84)
0.044	0.008	-0.002	0.000	-0.002	0.101	0.001
(1.220)	(3.400)	(-1.950)	(-1.010)	(-1.110)	(1.920)	(0.800)

Note: This table reports the monthly firm-level cross-sectional regression slope coefficients and their associated Newey-West (1987) adjusted t-statistics for the equation (5) of 986 Singapore firms for the period from Jan-1992 to Jan-2018. We regress the monthly stock return on a set of lag explanatory variable that long-run reversal (REV), market beta (BETA), book to market ratio (BM), firm size (SIZE), illiquidity (ILLQ), skewness (SKEW)

Table 11: Firm Level Cross Sectional Regression on Small and Large Firms

	Small firms				Large firms			
	Coeff	t values	Coeff	t values	Coeff	t values	Coeff	t values
Intercept	.053***	5.57	0.809***	3.31	.017	1.23	0.216	1.30
MOM_3	.070***	3.89	0.075***	3.86	-.0272	-0.48	-0.054	-0.63
BETA			0.001	0.29			-0.008	-0.83
BM			0.002	1.12			0.000	-0.32
SIZE			-0.044***	-3.15			-0.010	-1.30
ILLIQ			-3.451	-0.01			-8.772	-1.38
SKEW			-0.003	-0.21			0.014	0.88

	Small firms				Large firms			
	Coeff	t values	Coeff	t values	Coeff	t values	Coeff	t values
Intercept	.051***	4.31	0.848***	3.54	.014	1.32	0.211	1.33
MOM_6	.034***	3.40	0.040***	4.16	-.021	-0.66	-0.031	-0.73
BETA			0.001	0.38			-0.007	-0.58
BM			0.002	1.07			-0.002	-1.12
SIZE			-0.046***	-3.42			-0.010	-1.33
ILLIQ			1.210	0.24			-2.709	-1.17
SKEW			-0.007	-0.65			0.014	0.94

	Small firms				Large firms			
	Coeff	t values	Coeff	t values	Coeff	t values	Coeff	t values
Intercept	.054***	3.60	0.996***	3.59	.016	1.02	0.040	1.44
REV	.012**	2.42	0.010	1.83	-.015	-0.41	0.004	0.94
BETA			0.001	0.18			0.002	1.04
BM			0.078	1.62			-0.001	-0.31
SIZE			-0.054***	-3.49			-0.002	-1.43
ILLIQ			7.161	0.83			-1.879	-0.17
SKEW			-0.006	-0.45			-0.001	-0.99

Note: This table reports the monthly firm-level cross-sectional regression slope coefficients and their associated Newey-West (1987) adjusted t-statistics for the equation (3,4,5) of 986 Singapore firms for the period from Jan-1992 to Jan-2018 based on small and large firms. I separate these firms by using the median value of the size variable. I regress the monthly stock return on a set of lag explanatory variable that short-run momentum (MOM), long-run reversal (REV), market beta (BETA), book to market ratio (BM), firm size (SIZE), illiquidity (ILLQ), skewness (SKEW)

Table 12: Firm Level Cross Sectional Regression on High IVOL Firms and Low IVOL Firms

	High IVOL firms				Low IVOL firms			
	Coeff	t values	Coeff	t values	Coeff	t values	Coeff	t values
Intercept	.061***	3.52	0.404**	2.42	.010**	2.82	0.073***	4.38
MOM_3	.076***	3.39	0.086***	3.60	-.001	-0.19	-0.001	-0.10
BETA			0.005	1.29			-0.001	-1.05
BM			0.005	0.91			-0.004**	-2.92
SIZE			-0.019	-1.98			-0.003***	-4.00
ILLIQ			-0.806	-1.02			0.634**	2.79
SKEW			-0.003	-0.26			0.000	-0.41

	High IVOL firms				Low IVOL firms			
	Coeff	t values	Coeff	t values	Coeff	t values	Coeff	t values
Intercept	0.058***	3.55	0.421**	2.52	0.009**	2.59	0.073***	4.32
MOM_6	0.040***	3.17	0.037***	3.36	-0.006	-1.04	-0.001	-0.18
BETA			0.002	0.77			-0.002	-1.14
BM			0.008	1.37			-0.005**	-2.99
SIZE			-0.020**	-2.08			-0.003***	-4.02
ILLIQ			-0.434	-0.58			0.771**	2.76
SKEW			-0.004	-0.31			0.000	-0.47

	High IVOL firms				Low IVOL firms			
	Coeff	t values	Coeff	t values	Coeff	t values	Coeff	t values
Intercept	0.046***	3.69	0.533***	4.52	0.010	0.51	0.070***	3.68
REV	0.014**	2.69	0.017**	2.91	0.009**	2.75	-0.002	-0.90
BETA			0.000	-0.15			-0.002	-1.37
BM			0.019	1.65			-0.004**	-2.70
SIZE			-0.027***	-4.51			-0.003**	-3.16
ILLIQ			1.371	1.09			0.435	1.17
SKEW			-0.003	-0.27			-0.001	-1.24

Note: This table reports the monthly firm-level cross-sectional regression slope coefficients and their associated Newey-West (1987) adjusted t-statistics for the equation (3,4, 5) of 986 Singapore firms for the period from Jan-1992 to Jan-2018 based on high IVOL and low IVOL firms. I separate these firms by using the median value of the size variable. I separate these firms by using the median value of the size variable. I regress the monthly stock return on a set of lag explanatory variable that short run momentum (MOM), long-run reversal (rev), market beta (BETA), book to market ratio (BM), firm size (SIZE), illiquidity (ILLQ), skewness (SKEW)

Appendix Table 1: Firm Level Cross Sectional Regression with mom_3 as a Main Regressor (2000 to 2018)

Panel A: Equal Weighted Regression

INTERCEPT	MOM_3	BETA	BM	SIZE	ILLIQ	SKEW
.046**	0.102***					
(2.38)	(5.59)					
0.456**	0.103***	0.000	-0.005	-0.022*	-0.679	-0.001
(2.35)	(4.92)	(0.16)	(-1.93)	(-2.33)	(-0.16)	(-0.10)

Panel B: Value Weighted Regression

INTERCEPT	MOM_3	BETA	BM	SIZE	ILLIQ	SKEW
0.002	0.055***					
(0.40)	(6.39)					
0.126**	0.056***	-0.002	-0.002	-0.005	0.713	0.002
(2.82)	(3.76)	(-1.96)	(-1.36)	(-2.74)	(1.56)	(0.55)

Note: This table reports the monthly firm-level cross-sectional regression slope coefficients and their associated Newey-West (1987) adjusted t-statistics for the equation (3) of 986 Singapore firms for the period from Jan-2000 to Jan-2018. We regress the monthly stock return on a set of lag explanatory variable that momentum (MOM_3), market beta (BETA), book to market ratio (BM), firm size (SIZE), illiquidity (ILLQ), skewness (SKEW)

Appendix Table 2: Firm Level Cross Sectional Regression with mom_6 as a Main Regressor (2000 to 2018)

Panel A: Equal Weighted Regression

INTERCEPT	MOM_6	BETA	BM	SIZE	ILLIQ	SKEW
0.045**	0.047***					
(2.42)	(5.01)					
0.463**	0.043***	0.000	-0.008	-0.022**	0.139	-0.001
(2.38)	(3.67)	(0.12)	(-1.87)	(-2.32)	(0.28)	(-0.26)

Panel B: Value Weighted Regression

INTERCEPT	MOM_6	BETA	BM	SIZE	ILLIQ	SKEW
0.001	0.007					
(0.39)	(0.63)					
0.132***	0.003	-0.002	-0.001	-0.006***	0.242	0.005
(3.31)	(0.28)	(-1.16)	(-1.35)	(-3.25)	(0.96)	(1.48)

Note: This table reports the monthly firm-level cross-sectional regression slope coefficients and their associated Newey-West (1987) adjusted t-statistics for the equation (4) of 986 Singapore firms for the period from Jan-2000 to Jan-2018. We regress the monthly stock return on a set of lag explanatory variable that momentum (MOM_3), market beta (BETA), book to market ratio (BM), firm size (SIZE), illiquidity (ILLQ), skewness (SKEW)

Appendix Table 3: Firm Level Cross Sectional Regression with REV as a Main Regressor

Panel A: Equal Weighted Regression

INTERCEPT	REV	BETA	BM	SIZE	ILLIQ	SKEW
0.038	0.017					
(1.55)	(1.91)					
0.463*	0.016	0.001	-0.006	-0.022*	0.211	-0.003
(2.00)	(1.68)	(0.55)	(-1.89)	(-2.03)	(1.32)	(-0.72)

Panel B: Value Weighted Regression

INTERCEPT	REV	BETA	BM	SIZE	ILLIQ	SKEW
0.000	0.008					
(0.16)	(1.83)					
0.082	0.009	-0.001	0.000	-0.004**	1.387*	0.002
(2.26)	(1.81)	(-1.29)	(-0.71)	(-2.37)	(2.13)	(1.19)

Note: This table reports the monthly firm-level cross-sectional regression slope coefficients and their associated Newey-West (1987) adjusted t-statistics for the equation (5) of 986 Singapore firms for the period from Jan-2000 to Jan-2018. We regress the monthly stock return on a set of lag explanatory variable that momentum (MOM_3), market beta (BETA), book to market ratio (BM), firm size (SIZE), illiquidity (ILLQ), skewness (SKEW)

Appendix Table 4: Firm-Level Cross-Sectional Regression with mom_3 as the Main Regressor (2008 to 2018)

Panel A: Equal Weighted Regression

INTERCEPT	MOM_3	BETA	BM	SIZE	ILLIQ	SKEW
.076***	.094***					
(7.48)	(3.75)					
0.716***	0.088***	0.000	-0.004	-0.034***	0.125	0.005
(4.32)	(2.85)	(0.11)	(-1.37)	(-4.12)	(0.19)	(0.36)

Panel B: Value Weighted Regression

INTERCEPT	MOM_3	BETA	BM	SIZE	ILLIQ	SKEW
0.006**	0.042***					
(2.37)	(4.32)					
0.186***	0.034**	-0.001	-0.001	-0.008***	0.899	0.006
(4.64)	(2.13)	(-0.90)	(-1.05)	(-4.59)	(0.22)	(1.68)

Note: This table reports the monthly firm-level cross-sectional regression slope coefficients and their associated Newey-West (1987) adjusted t-statistics for the equation (3) of 986 Singapore firms for the period from Jan-2008 to Jan-2018. We regress the monthly stock return on a set of lag explanatory variable that momentum (MOM_3), market beta (BETA), book to market ratio (BM), firm size (SIZE), illiquidity (ILLQ), skewness (SKEW)

Appendix Table 5: Firm Level Cross Sectional Regression with mom_6 as a Main Regressor (2008 to 2018)

Panel A: Equal Weighted Regression

INTERCEPT	MOM_6	BETA	BM	SIZE	ILLIQ	SKEW
.071***	.039***					
(6.23)	(3.06)					
0.709***	0.030**	0.000	-0.008	-0.034***	0.392	0.000
(3.88)	(2.15)	(0.05)	(-1.33)	(-3.64)	(0.53)	(0.03)

Panel B: Value Weighted Regression

INTERCEPT	MOM_6	BETA	BM	SIZE	ILLIQ	SKEW
0.004	-0.005					
(1.79)	(-.40)					
-0.009	-0.002**	-0.001	-0.008***	0.116	0.007	0.180***
(-0.56)	(-3.08)	(-1.24)	(-4.39)	(0.27)	(1.90)	(4.51)

Note: This table reports the monthly firm-level cross-sectional regression slope coefficients and their associated Newey-West (1987) adjusted t-statistics for the equation (4) of 986 Singapore firms for the period from Jan-2008 to Jan-2018. We regress the monthly stock return on a set of lag explanatory variable that momentum (MOM_3), market beta (BETA), book to market ratio (BM), firm size (SIZE), illiquidity (ILLQ), skewness (SKEW)

Appendix Table 6: Firm Level Cross Sectional Regression with Rev as a Main Regressor (2008 to 2018)

Panel A: Equal Weighted Regression

INTERCEPT	REV	BETA	BM	SIZE	ILLIQ	SKEW
0.072***	0.005***					
(4.55)	(3.66)					
0.756***	0.002**	0.000	-0.006	-0.036***	3.502*	-0.001
(3.49)	(2.89)	(0.17)	(-1.33)	(-3.41)	(1.83)	(-0.20)

Panel B: Value Weighted Regression

INTERCEPT	REV	BETA	BM	SIZE	ILLIQ	SKEW
0.004	0.002					
(1.78)	(4.51)					
0.135***	0.002***	0.000	-0.001	-0.006***	1.544*	0.002
(6.97)	(4.07)	(-0.10)	(-1.26)	(-6.74)	(1.90)	(0.72)

Note: This table reports the monthly firm-level cross-sectional regression slope coefficients and their associated Newey-West (1987) adjusted t-statistics for the equation (5) of 986 Singapore firms for the period from Jan-2008 to Jan-2018. We regress the monthly stock return on a set of lag explanatory variable that momentum (MOM_3), market beta (BETA), book to market ratio (BM), firm size (SIZE), illiquidity (ILLQ), skewness (SKEW)