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Overreaction and momentum in the Vietnamese stock market.

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Abstract

Although the solid empirical proof of momentum is documented in various stock markets, there are a great number of debates among academics with respect to the source of the momentum profit. This paper contributes to the extant literature in three key aspects. Firstly, evidence of momentum is documented in the Vietnamese stock market during 2009-2019, which is consistent with Vo and Truong (2018) and Le and Bertrand (2020). Secondly, motivated by models of Daniel et al. (1998) and Byun et al. (2016), we propose a measure of overreaction in

Vietnam based on the trading volume and the sign of stock returns. This measure of overreaction seems to be a predictor of stock returns. Stocks that have experienced a stronger upward overreaction earn the higher average returns. Finally, while the momentum profit disappears after controlling for the effect of overreaction and asset pricing models, the trading strategy based on overreaction provides significant returns even we adjust for the momentum effect and asset pricing models. Given this backdrop, momentum in Vietnam arises from the investors' overreaction to private information as suggested by Daniel et al. (1998).

Keywords: momentum, overreaction, overconfident investors, stock returns, trading strategy.

1. Introduction

As initially documented by Jegadeesh and Titman (1993), a momentum strategy that is long shares with high past returns and short shares with low past returns would earn an abnormal return. Over the last decades, numerous studies provide solid evidence of the momentum profit in many different equity markets. Momentum is not only discovered in developed markets such as the US (Jegadeesh and Titman, 2001; Asness et al, 2013; Byun et al, 2016), Europe (Van Dijk and Huibers, 2002; Doukas and McKnight, 2005; Antoniou et al, 2007; Huhn and Scholz, 2018), but also in various emerging markets (Rouwenhorst, 1999; Cakici et al, 2013, Butt et al, 2021).

Although momentum is comprehensively investigated, the source of momentum profit is controversial. Grundy and Martin (2001) state that the momentum profitability is not compensation for bearing a higher risk level. From the behavioural explanation, momentum seems to arise from the investors' overreaction. Daniel et al. (1998) argue that many investors tend to overestimate their ability to obtain private information and forecast stock prices. They are

defined as overconfident investors. Some of their predictions might be appropriate when public information signals arrive, which increases their level of confidence due to biased self-attribution. Consequently, overconfident investors continue overreacting to private information. Continuing overreaction leads to momentum in share prices over a short period. In the long term, stock prices would be adjusted to their fundamental values, which leads to the reversal. Later on, there are several studies providing supporting evidence of this explanation: Lee and Swaminathan (2000), Cooper et al. (2004), Hwang (2010), Byun et al. (2016), Hur and Singh (2016).

The momentum profit in the Vietnamese stock market is reported by Vo and Truong (2018). The most profitable momentum strategy is to choose equities based on past performance in the last six months and hold them for the next nine months. Le and Bertrand (2020) construct the momentum factor from four mimic portfolios sorted on size and the past return in six months. Tracking the return up to 24 months, they find that the momentum factor only generates positive returns in the first nine months. After nine months of delayed overreaction, stocks prices are adjusted toward their intrinsic values, then the return of momentum factor is significantly negative. These results are consistent with the explanation of Daniel et al. (1998).

The key motivation of this article is twofold. Firstly, we intensively re-examine the momentum profit in Vietnam between 2009 and 2019 by analyzing more than 300 non-financial shares in the Ho Chi Minh exchange. Secondly, motivated by Daniel et al. (1998) and Byun et al. (2016), we build a measure of investors' overreaction, which is based on the trading volume and the sign of stock returns. A combination of high trading volume and positive returns indicates the overreaction to positive private information, which pushes stock prices above their intrinsic values. Conversely, a high trading volume associated with negative returns implies the

overreaction to negative private information, which forecasts a decrease in share prices. To the best of our knowledge, there has been no published paper investigating overreaction and stock returns in Vietnam.

This article makes three main contributions. In the first place, we discover the empirical evidence of momentum in the Vietnamese equity market, which is in line with Vo and Truong (2018). Secondly, our measure of overreaction could be a predictor of Vietnamese stock returns. Stocks that have experienced a stronger upward overreaction provide the higher average returns. Finally, returns on trading strategies based on overreaction are robust after adjusting for momentum and asset pricing models, while returns on momentum portfolios become insignificant after adjusting for overreaction and asset pricing models. Hence, it could be concluded that the momentum profit in Vietnam arises from investors' overreaction.

2. Literature review

One of the most well-known stock market anomalies is the relation between a stock's return and its previous performance, which is known as momentum. It suggests that shares with high past returns during a medium period would generate a high return subsequently, while stocks with low past returns would continue falling. High-performance and low-performance shares are regarded as winners and losers. The pioneering work is carried out by Jegadeesh and Titman (1993). Analyzing the US market between 1965 and 1989, they find that a long-short zero-cost portfolio based on the past six-months returns provides an average excess monthly return of 0.95% over the next six months. Later on, the momentum profitability in the US is confirmed by Asness (1997); Jegadeesh and Titman (2001); Asness et al. (2013); Byun et al. (2016). Momentum is also discovered in other European developed markets (Van Dijk and Huibers, 2002; Doukas and McKnight, 2005; Antoniou et al., 2007; Huhn and Scholz, 2018).

Furthermore, the momentum effect is also found in emerging equity markets (Rouwenhorst, 1999; Cakici et al, 2013; Hanauer and Linhart, 2015; Butt et al., 2021).

Despite the solid empirical evidence of momentum in many equity markets over different periods, numerous debates have sparked among researchers and academics with regards to the sources of momentum profit. The risk-based point of view cannot give a reasonable explanation of the momentum profitability. The Fama-French three-factor model is unable to capture the momentum profitability in the US (Fama and French, 1996; Grundy and Martin, 2001). Yu (2012) shows that the momentum strategy generates significantly positive risk-adjusted returns within the framework of the Fama-French three-factor model and the Carhart four-factor model. Momentum is also not driven by industry risk (Grundy and Martin, 2001) or business cycle variables (Cooper et al, 2004). Conrald and Kaul (1998) declare that the momentum profit simply reflects cross-sectional variability in average returns. According to their hypothesis, winners should continue to outperform losers in any post ranking period. It is inconsistent with the empirical result of Jegadeesh and Titman (2001), who point out that losers earn significantly higher returns than winners after one year of portfolio formation.

From the behavioural explanation, a large number of studies postulate that the overreaction of investors causes momentum. Daniel et al. (1998) declare that numerous investors have a tendency to overestimate their ability to obtain private information and underestimate their forecast errors. These investors are known as overconfident investors. Some of their predictions might be appropriate when public information signals arrive, which increases their level of confidence due to biased self-attribution. As a result, overconfident investors continue overreacting to private information. Continuing overreaction causes momentum in share prices in a short period. However, over the long term, securities prices would be adjusted to their

fundamental values, which leads to long-term reversals. There is empirical evidence supporting Daniel et al. (1998). The positive relation between the momentum profitability and the proxies of investor overconfidence is reported in several papers. Lee and Swaminathan (2000) state that past trading volume forecasts both the persistence and magnitude of momentum profit. According to Cooper et al. (2004), the average monthly momentum profit is significantly positive (negative) following positive (negative) market returns. Furthermore, Hwang (2010) finds that the momentum effect increases if the correlation of investors' forecast errors is higher, which is consistent with the prediction of Daniel et al. (1998). Using the signed trading volume to measure continuing overreaction (see details in section 3.2), Byun et al. (2016) point out that continuing overreaction is better than past returns in predicting future returns. A strategy, which is long shares with upward continuing overreaction and short shares with downward continuing overreaction, earns a considerably positive profit. Using a new measure that directly captures the speed with which stocks react to firm-specific information, Hur and Singh (2016) assert that momentum profits are consistent with behavioral models' predictions regarding investors' overreaction.

In Vietnam, evidence of momentum is discovered by Vo and Truong (2018). Examining 197 shares in the Ho Chi Minh exchange from 2007 to 2015, they report that ten out of sixteen momentum strategies generate significantly positive returns. A momentum strategy, which chooses shares based on the past six months and holds them for the next nine months, is the most profitable strategy. Additionally, momentum profitability persists after subtracting transaction costs. Le and Bertrand (2020) build the momentum factor from four mimic portfolios sorted on size and the past return in six months. Between 2009 and 2019, the annual average return of momentum factor is 6.88%. Furthermore, to evaluate three different explanations of the

momentum profit, they track the momentum return up to two years after the portfolio formation. The momentum factor only earns positive returns during the first nine months after the formation, which is consistent with Vo and Truong (2018). From month 10 to month 24, losers outperform winners. This evidence provides support for the delayed overreaction of Daniel et al. (1998). Given this backdrop, the momentum effect exists in Vietnam and the key source behind this effect is likely to be the investors' overreaction.

3. Methodology

3.1. Data sample

This paper focuses on the Ho Chi Minh stock exchange that accounts for more than 90% of the Vietnamese market capitalization. Most stocks listed in the Hanoi stock exchange belong to medium and small-sized firms, then their stock prices are very likely to be manipulated. Data sample includes more than 300 non-financial shares in the Ho Chi Minh stock exchange between 2009 and 2019. This period is selected because a variety of large companies that represent the Vietnamese economy are only listed from 2009. Furthermore, due to the market bubble over 2005-2007 and the financial crisis in 2008, stock prices before 2009 may contain a great amount of noise, which leads to possible inaccuracies. Adjusted stock prices are collected from DataStream, while accounting figures are obtained from both DataStream and Fiin group, which is a local data provider. Sample stocks must meet the following criteria. Firstly, their financial reports must be audited and their accounting data from both data sources must be identical. Secondly, illiquid stocks with no transaction in ten consecutive trading days are excluded. Finally, if the absolute return of a share in a particular week is more than 35%, it is also removed from the sample.

Table 1: The number of sample shares

| Year | Number of stocks | Year | Number of stocks |
|------|------------------|------|------------------|
| 2009 | 124 | 2015 | 265 |
| 2010 | 187 | 2016 | 279 |
| 2011 | 216 | 2017 | 304 |
| 2012 | 238 | 2018 | 319 |
| 2013 | 248 | 2019 | 340 |
| 2014 | 250 | | |

3.2. *Overreaction measure*

According to Daniel et al. (1998), due to biased self-attribution, investors become more overconfident, which leads to continuing overreaction. Following Byun et al. (2016), we build the continuing overreaction measure as follows. Firstly, trading volume is used as a proxy for the degree of overreaction. Overconfident investors tend to trade excessively, which increases trading volume. The positive relationship between overconfidence and trading volume is documented in many papers: Glaser and Weber (2009); Grinblatt and Keloharju (2009); Daniel and Hirshleifer (2015). Secondly, only using trading volume might be not enough to capture the direction of overreaction since both winners and losers tend to experience high trading volume (Jeffrey et al, 2015). Hence, we assume that the direction of overreaction is identified by the sign of contemporaneous return. As a result, a combination of high trading volume and positive (negative) return implies overreaction to positive (negative) private information. The signed trading volume for stock i during week t ($SV_{i,t}$) is:

$$SV_{i,t} = \begin{cases} TV_{i,t} & \text{if } r_{i,t} > 0 \\ 0 & \text{if } r_{i,t} = 0 \\ -TV_{i,t} & \text{if } r_{i,t} < 0 \end{cases}$$

Where $TV_{i,t}$ is the weekly trading volume, which equals the sum of daily trading volume in each week. The daily trading volume of a stock is the product of its traded shares multiplied by its closing price. $r_{i,t}$ is the return of stock i during week t .

Finally, the level of overreaction is the sum of signed trading volume divided by the average trading volume over the past six months:

$$OR_{i,t} = \frac{SV_{i,t-1} + SV_{i,t-2} + \dots + SV_{i,t-j}}{\text{average}(TV_{i,t-1} + TV_{i,t-2} + \dots + TV_{i,t-j})}$$

Where $OR_{i,t}$ is the measure of overreaction for stock i at week t . j is the length of the formation period. Since the overreaction is estimated based on the last six months, j is usually equal to 24 or 25. A highly positive OR indicates that investors overreact to positive returns of a stock during a period of time, which pushes its price above the intrinsic value. By contrast, a highly negative OR implies delayed overreaction to negative stock returns, which decreases its price.

3.3. Portfolio formation

To construct the winner and loser portfolios, we apply the method of Jegadeesh and Titman (1993). According to Vo and Truong (2018), in Vietnam, the pre-formation and post-formation periods of the most profitable momentum strategy are six months and nine months, respectively. Hence, at the start of every month between July 2009 and December 2018, all stocks are ranked on the past six-month returns (from month $t-1$ to month $t-6$). Then, they are divided into five quintiles. The value-weighted returns on each quintile are computed for the following nine months. Overlapping portfolios are also built to enhance the tests' power (Jegadeesh and Titman, 1993). The return on a momentum portfolio in any month consists of returns on that quintile built in the last nine months. For example, a September loser return is an equally weighted average of the first-month return on the loser built in August, the second-month return on the loser built in July, etc., the ninth-month return on the loser built in January.

All shares are also put into five portfolios based on the estimated OR. The construction of these portfolios are similar to momentum portfolios. The only difference is that shares are sorted on the measure of overreaction instead of the past returns. We focus on the highest (lowest) OR

quintile, which indicates the strongest overreaction on the positive (negative) side. Returns on portfolios ranked on the past returns and OR are displayed in the next section.

4. Results and discussions

4.1. The momentum effect in Vietnam

Table 2: Analysis on portfolios ranked on the past returns

| | Winner | 2 | 3 | 4 | Loser | WML |
|-----------------------------|----------|---------|--------|--------|--------|---------|
| Annual average return (%) | 16.052** | 13.580* | 8.995 | 5.920 | 4.805 | 11.247* |
| t-statistic | 3.098 | 2.061 | 1.527 | 1.106 | 0.956 | 1.733 |
| Capitalization (\$ million) | 191.24 | 169.78 | 132.33 | 100.00 | 111.43 | - |
| Market-to-book | 2.057 | 1.557 | 1.480 | 1.223 | 1.191 | - |

Note: The average values of market capitalization, market-to-book ratio are reported. The annual average return is: $(1 + \bar{r}_i)^{52} - 1$. \bar{r}_i is the weekly average return of portfolio i over 2009-2019. *, **, and *** imply the significance at 0.1, 0.05, and 0.01 respectively.

It is evident that momentum exists in Vietnam during 2009-2019. The winner portfolio delivers a highly positive return, at more than 16% per annum; while the annual average return of the loser is substantially lower, at only around 5%. The WML (Winner minus Loser) provides a significant return of roughly 11%, which is in line with the result of Vo and Truong (2018). Winners seem to be large and growth stocks, with an average capitalization of \$191.24 million and an average market-to-book of about 2. By contrast, most losers tend to be small and value firms with lower capitalizations and market-to-books. It is the reason why momentum could explain the growth effect in Vietnam as suggested by Le and Bertrand (2020).

4.2. Overreaction and stock returns

Table 3: Analysis on portfolios ranked on OR

| Portfolios ranked on OR | 1 | 2 | 3 | 4 | 5 | 1-5 |
|-----------------------------|-----------|---------|---------|---------|---------|---------|
| Annual average return (%) | 16.903*** | 11.482 | 9.617* | 6.797 | 6.693 | 10.209* |
| t-statistic | 3.378 | 1.650 | 2.071 | 1.494 | 1.187 | 1.749 |
| OR | 10.302 | 4.617 | 1.341 | -2.006 | -7.739 | - |
| Capitalization (\$ million) | 148.363 | 139.910 | 131.223 | 119.887 | 119.713 | - |
| M/B | 1.743 | 1.595 | 1.496 | 1.359 | 1.376 | - |

Note: The average values of market capitalization, market-to-book ratio are reported. The annual average return is: $(1 + \bar{r}_i)^{52} - 1$. \bar{r}_i is the weekly average return of portfolio i over 2009-2019. *, **, and *** imply the significance at 0.1, 0.05, and 0.01 respectively.

A monotonic relationship between the OR ranks and portfolio returns could be clearly observed. Stocks that are faced with strong upward overreaction provide the highest average return, at close to 17% annually. In contrast, stocks that are faced with strong downward overreaction earn the lowest average return, at only about 6.7%. The last column reports the return on a zero-investment portfolio, that is long the upward-overreaction portfolio (portfolio 1) and short the downward-overreaction portfolio (portfolio 5). At the level of 10%, this zero-investment portfolio yields a significantly positive return of around 10.2% per year. Thus, the estimated measure of overreaction is likely to predict future stock returns. The higher the OR, the higher the average return.

4.3. Overreaction and momentum

4.3.1. Portfolio-adjusted returns

In this section, we make a comparison between trading strategies based on past returns and OR. The portfolio-adjusted returns on one strategy are computed using returns on portfolios built by the remaining strategy. For instance, to calculate the momentum-adjusted returns of OR quintiles, the return of each share is adjusted by subtracting the return of the momentum quintile where the share belongs.

The raw returns of momentum and OR portfolios are nearly the same. The return of WML is around 11.25%, with a t-statistic of 1.73. The return differential between the highest and lowest OR portfolios is about 10.21%, with a t-statistic of 1.75. Both strategies show the same return patterns. However, the portfolio-adjusted returns of two strategies are much different. The momentum-adjusted returns of OR portfolios exhibit a monotonic decrease across the OR quintiles. The difference in adjusted returns between portfolio 1 and portfolio 5 is significant at

the level of 5%, at around 5.9%. By contrast, the portfolio-adjusted returns of momentum portfolios do not show a clear decrease from the winner to the loser. The WML adjusted return is only around 1.7% and it is statistically insignificant. Except for portfolio 4, the t-statistics of adjusted returns on momentum portfolios are very close to zero. It is evident that the profits of OR strategies subsume those of momentum strategies.

Table 4: Portfolio-adjusted returns of momentum and OR portfolios

| Panel A. Portfolio-adjusted returns of momentum portfolios | | | | | | |
|--|-----------|----------|---------|---------|--------|---------|
| | Winner | 2 | 3 | 4 | Loser | WML |
| Raw return (%) | 16.052*** | 13.580** | 8.995 | 5.920 | 4.805 | 11.247* |
| t-statistic | 3.098 | 2.061 | 1.527 | 1.106 | 0.956 | 1.733 |
| Portfolio-adjusted return (%) | 1.692 | 0.419 | -0.130 | -3.124* | 0.028 | 1.664 |
| t-statistic | 0.879 | 0.238 | -0.064 | -2.156 | 0.019 | 0.541 |
| Panel B. Portfolio-adjusted returns of OR portfolios | | | | | | |
| Portfolios ranked on OR | 1 | 2 | 3 | 4 | 5 | 1-5 |
| Raw return (%) | 16.903*** | 11.482 | 9.617** | 6.797 | 6.693 | 10.209* |
| t-statistic | 3.378 | 1.650 | 2.071 | 1.494 | 1.187 | 1.749 |
| Portfolio-adjusted return (%) | 2.753 | -0.694 | -1.168 | -1.973 | -3.108 | 5.861** |
| t-statistic | 1.546 | -0.343 | -0.833 | -1.494 | -1.680 | 2.178 |

The annual average return is: $(1 + \bar{r}_i)^{52} - 1$. \bar{r}_i is the weekly average return of portfolio i over 2009-2019. *, **, and *** imply the significance at 0.1, 0.05, and 0.01 respectively.

4.3.2. The CAPM- and Fama-French- adjusted returns

To estimate the CAPM-adjusted returns, we run the following regression:

$$R_{it} - R_{ft} = a_i + b_i * [R_{mt} - R_{ft}] + \varepsilon_{it}$$

R_{it} is the return of the portfolio i for period t . R_{mt} is the market return, which is the return of VN-Index. R_{ft} is the yield on the one-year Vietnamese government bond. ε_{it} is the residual for period t . Similarly, the Fama French-adjusted returns (FF-adjusted) are calculated by running the Fama-French three-factor regression:

$$R_{it} - R_{ft} = a_i + b_i * [R_{mt} - R_{ft}] + s_i * SMB_t + h_i * HML_t + \varepsilon_{it}$$

Table 5: The CAPM- and FF- adjusted returns of momentum and OR portfolios

| Panel A. The CAPM- and FF-adjusted returns of momentum portfolios | | | | | | |
|---|-----------|----------|-------|-------|--------|---------|
| | Winner | 2 | 3 | 4 | Loser | WML |
| The CAPM-adjusted returns (%) | 10.477*** | 8.14*** | 3.905 | 2.266 | 2.61 | 11.087* |
| t-statistic | 3.168 | 2.967 | 1.357 | 0.81 | 0.741 | 1.913 |
| The FF-adjusted returns (%) | 10.22*** | 7.993*** | 3.7 | 0.825 | -0.55 | 7.418 |
| t-statistic | 3.098 | 2.89 | 1.24 | 0.259 | -0.133 | 1.476 |

| Panel B. The CAPM- and FF-adjusted returns of OR portfolios | | | | | | |
|---|-----------|---------|--------|-------|-------|----------|
| Portfolios ranked on OR | 1 | 2 | 3 | 4 | 5 | 1-5 |
| The CAPM-adjusted returns (%) | 12.106*** | 6.192** | 5.53** | 2.79 | 2.58 | 10.454** |
| t-statistic | 3.977 | 2.252 | 2.16 | 0.993 | 0.781 | 2.162 |
| The FF-adjusted returns (%) | 11.926*** | 5.46** | 4.821* | 2.043 | 1.334 | 9.291** |
| t-statistic | 3.929 | 1.973 | 1.784 | 0.686 | 0.389 | 2.000 |

The annual average return is: $(1 + \bar{r}_i)^{52} - 1$. \bar{r}_i is the weekly average return of portfolio i over 2009-2019. *, **, and *** imply the significance at 0.1, 0.05, and 0.01 respectively.

Returns of OR portfolios is significant even after adjusting to asset pricing models. The CAPM-adjusted return of a portfolio, which is long shares with upward continuing overreaction and short shares with downward continuing overreaction, is statistically significant, at nearly 10.5% per year. Its FF-adjusted return is around 9.3% annually, which is also significant at the level of 5% with a t-statistic of 2. By contrast, returns of momentum portfolios decrease substantially and become insignificant after controlling for three factors. In the Fama-French three-factor model, the WML generate a statistically insignificant adjusted return of only 7.418% per annum with a t-statistic of about 1.5.

4.3.3. Double-sorted portfolios

We rank stocks by their past returns and OR to investigate whether abnormal positive returns on the winner portfolio are actually concentrated in stocks with high OR. If the momentum effect arises from investors' overreaction, the stronger the upward overreaction, the higher the average returns for stocks. Double-sorted portfolios are constructed as follows. Firstly, all stocks are divided into five groups based on past returns (or the OR). Consequently, in each group, stocks are ranked into three portfolios according to the OR (or the past returns), which leads to a total of

15 sub-portfolios. In panel A of Table 6, stocks are initially ranked on their past returns, then they are sorted on the OR. In panel B, stocks are initially ranked on the OR, then they are sorted on their past returns.

Table 6: Average returns of double-sorted portfolios

| Panel A. Average returns of portfolios ranked on past returns and OR | | | | | |
|--|----------------------|----------------------|---------------------|--------------------|-------|
| | Winner | 2 | 3 | 4 | Loser |
| High OR | 27.1% ^{**} | 16.73% ^{**} | 13.18% | 8.22% [*] | 5.92% |
| Neutral | 16.89% | 12.72% | 8.67% | 5.2% | 4.6% |
| Low OR | 8.95% | 9.24% [*] | 6.05% | 0.85% | 1.42% |
| High-Low | 18.15% [*] | 7.49% [*] | 7.13% | 7.37% [*] | 4.5% |
| Panel B. Average returns of portfolios ranked on OR and past returns | | | | | |
| | 1 | 2 | 3 | 4 | 5 |
| High past returns | 20.12% ^{**} | 17.18% [*] | 9.17% | 7.65% [*] | 7.55% |
| Neutral | 12.58% | 13.53% | 12.52% [*] | 6.18% | 4.21% |
| Low past returns | 23.62% ^{**} | 10.11% | 11.28% | 3.43% | 5.56% |
| High-Low | -3.5% | 7.07% | -2.11% | 4.22% [*] | 1.99% |

The annual average return is: $(1 + \bar{r}_i)^{52} - 1$. \bar{r}_i is the weekly average return of portfolio i over 2009-2019. *, **, and *** imply the significance at 0.1, 0.05, and 0.01 respectively.

When stocks are ranked on past returns and OR, an obvious positive relationship between the OR and average returns is observed. From the winner to the loser, high-OR sub-portfolios provide significantly higher average returns than low-OR portfolios. For example, the average return on high-OR-winner portfolio is more than 27% per year, while the average return on low-OR-winner portfolio is substantially lower, at only approximately 9%. Hence, superior returns on the winner portfolio are concentrated in stocks that have experienced a strong upward overreaction. It is consistent with the result of section 4.3. However, as shown in Panel B, when stocks are ranked on OR and past returns, there is no relationship between past returns and average returns. For example, in the first portfolio, stocks with low past returns earn the highest average return, at about 23.62%, whereas the annual average return of sub-portfolio with high past returns is lower, at around 20%. Meanwhile, in the second, fourth, and fifth portfolios, sub-portfolios with high

past returns provides the highest average returns. Given this backdrop, it could be concluded that most of the momentum profitability arises from the overreaction of investors.

5. Conclusion

Although the solid empirical proof of momentum is documented in various stock markets, there are a great number of debates among academics with respect to the source of momentum profit. The momentum profitability cannot be explained by the risk-based point of view (Grundy and Martin, 2001). From the behavioural perspective, the delayed overreaction of Daniel et al. (1998) is viewed as one of the leading explanations of momentum (Jegadeesh and Titman, 2001). Motivated by models of Daniel et al. (1998) and Byun et al. (2016), we propose a measure of overreaction in Vietnam based on the trading volume and the sign of stock returns. A combination of high trading volumes and positive returns indicates the overreaction to positive private information, then stock prices are pushed above their intrinsic values. Conversely, a high trading volume combined with negative returns implies the overreaction to negative private information, which forecasts a decrease in share prices.

The results of this article provide three main insights. Firstly, the momentum effect is documented in Vietnam during 2009-2019. The winner portfolio delivers a highly positive return, at more than 16% per annum; while the annual average return of the loser is substantially lower, at only around 5%. It is consistent with the result of Vo and Truong (2018). Secondly, the estimated measure of overreaction seems to predict future stock returns. Stocks that have experienced a stronger upward overreaction earn the higher average returns. Finally, while the momentum profit disappears after controlling for the effect of overreaction, the trading strategy based on overreaction provides significant returns even we adjust for the momentum effect. The CAPM- and Fama-French three-factor- adjusted returns of overreaction strategy are statistically

significant, whereas the momentum return becomes insignificant after adjusting for Fama-French three-factor model. Given this backdrop, momentum in Vietnam arises from the investors' overreaction to private information as suggested by Daniel et al. (1998).

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