Determinants of momentum strategy and return in short time horizon: case in Indonesian stock market

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Abstract: This research examined momentum profitability over a various time horizon and its sources in Indonesian stock market. The results show that the profitability of momentum return was inversely related to its holding period. The average return for 60 days strategy was significantly higher than buy-and-hold, while the return for 10 days strategy was significantly lower from buy-and-hold. In the section of momentum return sources, it is found that sector rotation is significant in explaining momentum returns in both winner and loser portfolio for all time horizons, while other variables have mixed influence.

Keywords: momentum strategy; Indonesian stock market; sector rotation; momentum sources.


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1 Introduction

Persistent returns in the direction of prior returns known as momentum profits have been shown to exist in different markets and countries over an intermediate length, generally 3–6 months. This finding has been puzzling finance theory EMH which states that past data, including market price, do not influence future market returns. Since then, researchers have been trying to find the sources of momentum profit. The research had been directed into two kinds of explanation of momentum profit sources: behaviour-based explanation and risk-based explanation (Meier, 2014).

In behaviour-based explanation, momentum profit is thought to arise due to the inefficiency of information digested by investors. Investors are thought to under/over-react information and thus momentum phenomenon arises as a result when investors revise their information perception (Chan et al., 1996).

In risk-based explanation, momentum excess return arises as a compensation of risk unknown to investors. However, previous research found that traditional risk-based framework such as CAPM could not explain away momentum returns. In this risk-based approach, momentum excess return should cease to exist once the momentum related risks are factored into the asset pricing framework, but so far there has been little agreement to which risk factors could momentum returns be attributed to Antoniou et al. (2007).

This research contributes to momentum profit phenomenon by finding the evidence that momentum strategy could be implemented in shorter time horizon and finding the factors that could explain its returns. In an effort to give clearer picture intuitively about relationships between momentum returns and its sources used in this study (sector rotation, market capitalisation, market states, and own price ratio with its moving average), a regression analysis is employed to give an intuitive answer.

2 Literature review

After the publication of Jegadeesh and Titman (1993), many researchers have been exploring the various markets in which momentum strategy generate significant excess profit. As prior researches found, momentum profitability is not only exclusive to US stock market, but also other parts of the world, including Europe (Rouwenhorst, 1998), Taiwan (Fu and Kang, 2009), India (Sehgal and Jain, 2015), and Indonesia (Toro and Dewi, 2014). Other researchers also found that momentum strategy is profitable as well in industry level, not just individual stocks (Moskowitz and Grinblatt, 1999; Fu and Kang, 2009).

These findings are not without conflicting results. Several studies showed that momentum strategy does not outperform buy and hold in several countries, including the mentioned countries. For example, Wiksuna (2009) showed that momentum strategy applied to Indonesian stock market withholding period of three months underperformed.

Today, the concept of asset rotation is no stranger in the investment world. As business performance varies across sectors during different business cycle stages, so does the performance of their stocks. Rehman et al. (2016) found that stock market liquidity is impacted by macroeconomic variables such as industrial production, which suggested that stocks liquidity changes as changes occur in macroeconomic variables. Khoury (2015) found a significant relationship between macroeconomic variables and
European automotive stocks, while the relationship between macroeconomic variables and stock returns, in the long run, is documented by Abbas and McMillan (2014).

The first publication that ties momentum performance directly to this perspective is Moskowitz and Grinblatt (1999). He found that momentum in industry level exists and could explain individual stock momentum by showing that industry momentum has a higher return than individual stock momentum. On the contrary, Grundy and Martin (2001) concluded that industry momentum could not explain momentum strategy profits. In a more intuitive way by regression analysis, Bacmann et al. (2001) showed that momentum profit is linked to industries represented by sector indices and business cycle (recession and expansion). Varying returns associated with the financial cycle is also documented by Fonseca (2013) that found a market model with beta-dependent on the different phases of financial cycle supports the observation of varying Treynor ratios across time.

3 Methodology

The approach we adopted for building individual stock level momentum portfolio follows the original method of Jegadeesh and Titman (1993) which gives ranks to stocks past returns and selected the top 10% in winner portfolio and bottom 10% in loser portfolio. Momentum returns is the difference between the winner and loser returns (long-short) that is rebalanced every day in equal dollar weight. Data of stocks composing IHSG index returns is sourced from www.yahoo.com from 6 February, 2013 until 22 December, 2015.

The portfolio construction procedure on sector level is similar to the individual level. The sector component is as listed by IDX. Therefore, the winner (loser) sector level portfolio will have all of stocks as listed by IDX in that particular sector. The same approach to construct momentum portfolio in high-cap and low-cap stocks. We followed MSCI Indonesian High and Small Cap for the list of stocks to be included, and chose 10 stocks that have the highest weight.

To find out the significance of sector rotation on momentum profits quantitatively, this paper regress the individual stock level returns for both winner and loser with independent variables that capture sector rotation, market size, market state, and own past price influence as defined by the ratio of selected stocks price with its moving average. Market state is defined as bullish if index closing price is above its 200-day MA and bearish if below its 200-day MA.

Instead of using the average return of winner minus loser momentum returns, this paper investigates both winner and loser portfolio individually for each holding periods to see whether implicit sector rotation is responsible for momentum profits. This study applied HAC Newey-West adjusted regression that modifies standard error estimates that correct for both autocorrelation and heteroscedasticity that may be present. The regression results were then analysed further by Shapley-Owen decomposition.

4 Results and discussion

The statistical results showed that the average return of 10 days momentum strategy is −1.63% with standard deviation of 8.21%. The average return of 20 days momentum
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strategy is –0.52% with standard deviation of 8.31%. The average return of 60 days momentum strategy is 3.13% with standard deviation of 11.45%. To summarise, all of the momentum strategy has higher standard deviation than buy and hold in 10, 20, 60 days holding periods. This study also found that momentum strategy is significantly underperforming the buy and hold index in the lowest holding period of 10 days, while it achieved a significantly abnormal return of 3.30% on average than buy-and-hold in 60 days holding period. This finding is in agreement with previous studies documenting that momentum strategy is profitable over the medium term, i.e., 3–12 months (Rouwenhorst, 1998; Toro and Dewi, 2014), but exhibits tendency to revert to the mean over shorter time horizon (Jegadeesh and Titman, 1993). Similar returns pattern could be observed at the sector level as well but with significantly lower volatility, except in 60 days (Tables 1 and 2).

Table 1  Descriptive statistics of momentum returns and index returns

<table>
<thead>
<tr>
<th></th>
<th>N</th>
<th>Mean (%)</th>
<th>Volatility* (%)</th>
<th>Skewness</th>
<th>Kurtosis</th>
</tr>
</thead>
<tbody>
<tr>
<td>10d Ri</td>
<td>685</td>
<td>–1.63</td>
<td>8.21</td>
<td>–8.76</td>
<td>123.48</td>
</tr>
<tr>
<td>20d Ri</td>
<td>685</td>
<td>–0.52</td>
<td>8.31</td>
<td>–7.61</td>
<td>104.31</td>
</tr>
<tr>
<td>60d Ri</td>
<td>685</td>
<td>3.13</td>
<td>11.45</td>
<td>–3.87</td>
<td>42.22</td>
</tr>
<tr>
<td>10d Rs</td>
<td>685</td>
<td>–0.03</td>
<td>5.72</td>
<td>–0.36</td>
<td>4.96</td>
</tr>
<tr>
<td>20d Rs</td>
<td>685</td>
<td>–0.02</td>
<td>7.74</td>
<td>–0.30</td>
<td>3.97</td>
</tr>
<tr>
<td>60d Rs</td>
<td>685</td>
<td>1.39</td>
<td>13.08</td>
<td>0.49</td>
<td>4.12</td>
</tr>
<tr>
<td>10d JCI</td>
<td>685</td>
<td>0.05</td>
<td>3.36</td>
<td>–0.40</td>
<td>5.94</td>
</tr>
<tr>
<td>20d JCI</td>
<td>685</td>
<td>0.02</td>
<td>4.49</td>
<td>–0.61</td>
<td>3.66</td>
</tr>
<tr>
<td>60d JCI</td>
<td>685</td>
<td>–0.17</td>
<td>7.49</td>
<td>–0.43</td>
<td>2.91</td>
</tr>
</tbody>
</table>

*Volatility as measured in standard deviation.

Table 2  Pair-wise test: momentum vs. buy-and-hold

<table>
<thead>
<tr>
<th></th>
<th>N</th>
<th>Mean (%)</th>
<th>T-value</th>
<th>Sig. (2-tailed)</th>
</tr>
</thead>
<tbody>
<tr>
<td>10d Ri – 10d JCI</td>
<td>685</td>
<td>–1.68</td>
<td>–4.73</td>
<td>0.000</td>
</tr>
<tr>
<td>20d Ri – 20d JCI</td>
<td>685</td>
<td>–0.54</td>
<td>–1.44</td>
<td>0.152</td>
</tr>
<tr>
<td>60d Ri – 60d JCI</td>
<td>685</td>
<td>3.30</td>
<td>5.61</td>
<td>0.000</td>
</tr>
<tr>
<td>10d Rs – 10d JCI</td>
<td>685</td>
<td>–0.08</td>
<td>–0.29</td>
<td>0.774</td>
</tr>
<tr>
<td>20d Rs – 20d JCI</td>
<td>685</td>
<td>–0.04</td>
<td>–0.12</td>
<td>0.902</td>
</tr>
<tr>
<td>60d Rs – 60d JCI</td>
<td>685</td>
<td>1.56</td>
<td>2.74</td>
<td>0.006</td>
</tr>
</tbody>
</table>

In the study of momentum return sources, we have found a mixed results between winner and loser returns as well as different results among time periods (Table 3). However, among all of the independent variables we have used to explain winner and loser returns, we have found sector rotation proxy is consistently able to significantly explain stock level momentum return in both long and short portfolio. Intuitively, this finding also makes sense because of the existence of business cycle.

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However, among all of the independent variables we have used to explain winner and loser returns, we have found sector rotation proxy is consistently able to significantly explain stock level momentum return in both long and short portfolio. Intuitively, this finding also makes sense because the existence of business cycle creates an opportunity for a certain sector to outperform other sectors and therefore, the stocks in that outperforming sector tend to outperform other stocks in different sectors in that period of time. Small cap effect shows significance and relatively high explanatory power in explaining winner return in 60 days. Thus, this finding is in agreement with previous findings (Hong and Stein, 1999; Grundy and Martin, 2001; Kirkpatrick, 2009) that found that momentum portfolio loses its profitability when small-cap stocks were removed from the portfolio.

Table 3  
**Momentum returns decomposition**

<table>
<thead>
<tr>
<th>Factors (%)</th>
<th>10 (W)</th>
<th>20 (W)</th>
<th>60 (W)</th>
<th>10 (L)</th>
<th>20 (L)</th>
<th>60 (L)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sector</td>
<td>21.2***</td>
<td>38.3***</td>
<td>23.2***</td>
<td>11.9***</td>
<td>9.2***</td>
<td>24.3***</td>
</tr>
<tr>
<td>High-cap</td>
<td>5.7**</td>
<td>0.9**</td>
<td>0.1</td>
<td>0.8</td>
<td>5.4**</td>
<td>2.4</td>
</tr>
<tr>
<td>Small-cap</td>
<td>5.0**</td>
<td>7.4</td>
<td>12.7***</td>
<td>2.6</td>
<td>3.4</td>
<td>7.3</td>
</tr>
<tr>
<td>Price ratio</td>
<td>1.0**</td>
<td>0.5</td>
<td>1.6**</td>
<td>0.9</td>
<td>1.2*</td>
<td>0.4</td>
</tr>
<tr>
<td>Market state</td>
<td>2.0*</td>
<td>0.3</td>
<td>2.9***</td>
<td>0.1</td>
<td>0.2</td>
<td>0.5</td>
</tr>
<tr>
<td>All variables</td>
<td>34.9</td>
<td>47.5</td>
<td>40.4</td>
<td>16.4</td>
<td>19.4</td>
<td>34.9</td>
</tr>
<tr>
<td>Residuals</td>
<td>65.1</td>
<td>52.5</td>
<td>59.6</td>
<td>83.6</td>
<td>80.6</td>
<td>65.1</td>
</tr>
<tr>
<td>Total</td>
<td>100.0</td>
<td>100.0</td>
<td>100.0</td>
<td>100.0</td>
<td>100.0</td>
<td>100.0</td>
</tr>
</tbody>
</table>

*ρ < 0.1, **ρ < 0.05, ***ρ < 0.01.

The associated momentum return in small cap also gives a light in explaining market size premium puzzle and also may give a plausible answer to why a naïve portfolio diversification rule could outperform Moskowitz rule (Nor and Islam, 2016) when the selected number of stocks were small. If the selected stocks have premiums associated with small caps which are relatively stronger than other stocks, then it is possible the selected stocks have better risk-adjusted return than Moskowitz portfolio selection rule.

Finally, from the regression results, we have found that our selected variables generally explain momentum returns better in the long portfolio than a short portfolio. This implies that the factors that are responsible for the continuation of weak returns could be different than the continuation of strong returns.

5  Conclusion

To summarise, we have found that momentum strategy could be profitably implemented using daily data rather than commonly used but longer weekly data. Momentum return is showing the tendency of continuation in the medium term (60 days), but tend to revert to the mean in the shorter term (10 days). The sources of its return generally differ in both long and short portfolio, but sector rotation is able to explain both of portfolio significantly. Finally, we have found that generally sector rotation, market capitalisation,
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market state, and price ratio to its moving average explain winner momentum portfolio return better than short momentum portfolio. Therefore, this study has three implications: One, momentum strategy could be successfully implemented by shorter time horizon investors. Second, because momentum returns could be explained by sector rotation and sector rotation could be explained by business cycle factors, by that logic, business cycle factors such as macroeconomic indicators could be used to model momentum returns. Third, by differentiating between long and short momentum portfolio, we have opened the possibility that the impact of a certain factor could be different for winner portfolio and loser portfolio or the factors themselves could be different.

References


