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Existence of short term momentum effect and stock market of Turkey

Abstract

The aim of this paper is to examine the existence of short term momentum effect in the stock market of Turkey. Momentum effect's existence is a questionable and debatable issue because it has been claimed by many that short term momentum effect has been found in the stock markets across the globe but the opposite group gives entirely different opinion and argues that short term momentum effect does not exist in many stock markets. There are conflicting results that have been documented in the financial literature about its existence. To address the existence of momentum issue, stock market of Turkey has been chosen in this regard because one group of authors claims that short term momentum effect exists in the stock market of Turkey but other group argues that momentum effect was not found in the Turkey's financial market. It is found out that strong short term momentum effect is presented in the stock market of Turkey and all momentum strategies are statistically significant and profitable. Future research should focus on sub-variants of price momentum strategy but it should also focus on finding the source of short term momentum effect because risk based model and behavioral models could not successfully explain short term momentum effect.

Keywords: short term momentum effect, momentum investment strategies, zero-cost momentum portfolio, winners and losers, sub-variants of price momentum strategy.

JEL Classification: G1, G2, G3.

Introduction

Short term momentum effect is a stock market phenomenon which states that in short run recent past winners will remain winners and recent past losers will remain losers and the former will outperform the latter. This short run period lasts for 3 to 12 months. Stocks that perform well are known as winner portfolios (winners or w) and worst performing stocks are known as loser portfolios (losers or l) (Jegadeesh & Titman, 1993). This phenomenon was first unearthed by Jegadeesh and Titman (1993) who found that momentum trading strategies are profitable in US stock markets. Since its inception, short term momentum effect has become the subject of examination for many stock markets. Jegadeesh and Titman (2001) conducted their study on US stock market again by extending the time period of sample from their previous paper and reaffirmed their own finding that short term momentum effect existed in US stock market but it vanished as time period of momentum strategy expired. A lot of papers have been written and many stock markets have been examined in this regard. For instance Rouwenhust (1998, 1999) examined 12 European stock markets and 20 Asian stock markets respectively for momentum phenomenon. Similarly, Griffin, Ji and Martin (2005) examined 39 stock markets from across the globe for short term momentum effect and momentum investment strategy. Also, Griffin, Ji and Martin (2003) examined momentum effect with business cycle and

found existence of momentum effect in stock market but argued that momentum can last for 3 to 5 years. Hameed and Kusandi (2002) also examined Asian stock markets for short term momentum effect. De Groot, Pang and Swinkels (2012) also examined frontier markets for short term momentum effect. Zhang (2006) also found the presence of short term momentum effect while examining stock markets for information sensitivity. In short, majority of the stock markets from across the globe have been examined by several authors for this phenomenon yet the very existence of momentum effect is questionable. There is no unanimity over its existence. There are conflicting results over the existence of short term momentum effect about the same stock market. Li, Qiu and Wu (2010) found that momentum strategies were not profitable in Chinese stock market whereas Kang, Liu and Ni (2002) found that short term effect existed in Chinese stock market and they are profitable. Hameed and Kusandi (2002) and Chui, Titman and Wei (2000) could not find the existence of momentum phenomenon in 6 and 8 Asian stock markets respectively. Similarly, two different research papers documented opposite results about the existence of short term momentum effect in the stock market of Turkey. For example, Griffin, Ji and Martin (2005) confirmed the existence of short term momentum effect in the stock market of Turkey in their paper "Global momentum strategies: a portfolio perspective" but Fernandes and Ornelas (2008) reported that they could not find the existence of short term momentum effect in Turkey's stock market. One may argue that since Turkey stock market is emerging market and they are known for their volatile or uncertain results but

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same conflicting results have been found in the case of developed stock markets. For instance, Henker, Henker and Huynh (2010) reported in their paper that they found no evidence of short term momentum effect in the stock market of Australia, in fact, they reported that there was no evidence of this phenomenon since 1970 but Hurn and Pavlov (2003) documented that they found the strong presence of short term momentum effect in the stock market of Australia. There are several conflicting results about emerging or developed stock markets in the financial literature which make the existence of short term momentum effect questionable. The aim of this paper is to address the issue of existence of short term momentum effect for the stock market that has been involved in conflicting results and to confirm whether it is present in Turkey's stock market or not. Therefore, stock market of Turkey, Borsa Istanbul, has been selected in this regard. The aim is to examine the Borsa Istanbul to confirm whether short term momentum effect is found or not and to document the profitability of investment momentum strategies.

One important thing that can be observed from the literature review on momentum is that source of momentum profits, derived by momentum strategy, is still unknown. For instance, momentum strategies contain risk (Hong, Lee & Swaminathan, 2003) so momentum profits were explained using risk based models like CAPM and Fama-French three factor model (Conrad & Kaul, 1998; Moskowitz & Grinblatt, 1999; and Naranjo & Porter, 2006) but models were not successful in explaining profits (Fama & French, 1996; and Jegadeesh & Titman, 2001). Some authors try to explain the source of momentum profits by behavioral models using behavioral biases (Daniel, Hirshleifer & Subrahmanyam, 1998; and Barberis, Shleifer & Vishny, 1998) but models were criticized on the grounds that they were weak and non-reliable (Rubinstein, 2000). The future research should focus on source of momentum profits because there is also no unanimity of over the source of momentum profits.

1. Literature review

Though short term momentum effect has long been examined and documented in majority of the stock markets across the globe but its existence is still disputed. There is a group of authors who registered that momentum effect existed for stock markets whereas another group of authors claimed that they have found no evidence of existence of short term momentum effect for the same stock markets. There are conflicting results about the existence of

momentum phenomenon which are discussed in this literature review.

Short term momentum effect, its existence and short term price continuation behavior have been found in stock markets of Africa (Joseph D. Vu, 2012) but Li, Qiu and Wu (2010) found in their paper "Momentum and seasonality in Chinese stock markets" that momentum strategies were not profitable in Chinese stock market. Liu et al. (2011) implemented the same strategy on 16 different stock markets and found that in ten stock markets, returns are fruitful and statistically significant. Nandan, Jindal and Agarwal (2015) also studied the stock market of India. Rastogi, Chaturvedula and Bang (2009) studied the financial markets of India and attempted to explain the momentum strategy from the view point of psychology of investors. They found that short term momentum effect existed in stock market of India and it is also producing good returns. Zoghlami (2011) found that price momentum strategies are profitable in the stock market of Tunisia but Zoghlami (2013) argued that there is a huge disagreement over the source of momentum profit.

Hurn and Pavlov (2003) examined Australian stock markets for the existence of short term momentum effect. They argued that despite the availability of ample amount of research on momentum phenomenon in the financial literature, not many papers are written on it in the context of Australian stock market. Therefore the aim of the authors is to fill the space which was left in financial literature by examining the Australian stock market for short term momentum effect. It must be remembered that the authors examined 200 stocks from the stock market of Australia. They gathered the data from the database AGSM for the period starting from December, 1998 and ending on December, 1983. They also wrote that the first section of their paper was limited to top 200 stocks because Australian stock market has a feature of low liquidity encounter for small stocks but they choose this stock by market capitalization. They reported that they have found the strong presence of short to medium term momentum effect in the Australian stock market. They also reported that strategies with one year holding period were statistically significant and posted a return of 5% to 7%. They also claimed the returns' percentages are in conformity with profit percentages reported in the international markets. They wrote that momentum phenomenon is still new to Australian stock market which should be investigated further in future. But, Henker, Henker and Huynh (2010) also examined Australian stock market and termed their finding as unique in comparison to the findings reported in the previous

research in the context of short term momentum effect. Contrary to the literature on momentum phenomenon, they wrote that they found no presence of short term momentum effect in the stock market of Australia and the authors went on to write that there was no presence of momentum effect since 1970. They argued that short term momentum effect phenomenon has no robustness when it comes to various sampling technique and they claimed that they found it to create awareness about this phenomenon in existing financial literature. The time period of data started from January, 1993 and ended on December, 2008. The database that they used was Datalink. It is important to note that the sample period of the data started when first research paper of momentum effect was published by Jegadeesh and Titman (1993). They wrote that time of the data is an advantage to their research because by having such time period, they have access to reliable data which is provided by electronic database. They further wrote that strong presence of momentum effect was due to the assumptions of far-sightedness in future about the acquisitions or delisting in sampling technique. They claimed that they brought a new dimension to the data which are required in momentum phenomenon. The new dimension of data was accounting data. They used market as well as accounting data for their research. They also wrote that Fama-French three factor model could not explain momentum profits. They claimed that the existence of momentum effect was a result of "look-ahead" bias which was generated from sampling procedure and their findings have provided strong support to weak form of efficient market hypothesis.

It is obvious from the above two papers that both articles are posting different results for the same stock market. One paper claims that momentum phenomenon existed in Australian stock market and another paper claimed that it never existed and showing it as a result of sampling technique. These are conflicting results which make the existence of short term momentum effect questionable.

Fernandes and Ornelas (2008) also examined 15 emerging stock markets. But their results were also entirely different than the existing literature. They reported that they found no evidence of existence of short term momentum effect in most of the stock markets included in the sample. They wrote that previous literature although found momentum phenomenon in the stock markets and momentum returns were positive but they are not always significant statistically and economically. They examined the data of 15 emerging stock markets from 1995 to 2005 and found no presence or evidence of presence of short term momentum

effect in stock markets included in the sample. There was no evidence of momentum phenomenon when stocks were controlled for risk and size. They associated their unique finding with the ease of access to the availability of bulk of information and its rapid diffusion. They also gave other explanations as well. For instance, they wrote that they may get results different than results in existing literature is due to sampling and data filtration method because they claimed that they have included higher number of stocks in their study whereas other papers have not had that much high number of stocks. They argued that surge in internet trading through brokers may also be one of the reasons. For instance, internet brokers have made trading easier and available to large number of people. So, in comparison to past, there are more individual investors available for trading and they behave in different than huge or specialist investors which caused a change in the behavior of pattern of market's stock prices. They termed above interpretation as complementary finding. Among the stock markets included in the sample, one stock market belonged to Turkey. They found no evidence of short term momentum effect in the Turkish stock market. However Griffin, Ji and Martine (2005) wrote a paper with the title of "Global momentum strategies: a portfolio perspective" and claimed that they have given a practical approach to momentum investment strategies. They studied 40 stock markets across the globe and found the presence of short term momentum effect for every stock market included in the sample. They wrote that momentum strategies were generally positive and statistically significant and documented that momentum returns were more profitable on long side than short position. One of the stock market in the sample was Turkish stock market and according to authors, they found the momentum effect in stock market of Turkey. They wrote that short term momentum effect was even positive for investors who want to take long position only in the stocks and price momentum strategies are profitable and large globally but in order to maximize the return of portfolios, short position of stocks must be exploited in this regard.

It can be observed here again that there are two different papers and registering different, opposite and conflicting results about the same stock market which questions the existence of short term momentum effect. Therefore stock market of Turkey has been chosen to address the issue of existence.

2. Data and methodology

The stock market which has been chosen in this regard is Borsa Istanbul. The index which has been selected to examine the existence of short term

momentum effect is “BIST 50”. This is for the first time this index has been selected for research to examine the Turkey’s stock market for existence of short term momentum effect. Share prices have been downloaded from Datastream. The time period of the data started from 10-April-2009 and ended on 10-April-2015. Only those companies have been included which have completed share prices throughout the time period. Therefore, 7 companies have been dropped because their share prices were not available throughout the period. The champion methodology of Jegadeesh and Titman (1993) has been followed in this paper in this regard. The corner stone of momentum investment strategy is to construct portfolios i.e. winner portfolios (W) and loser (L) portfolios. Before constructing portfolios, stock prices are converted into percentage returns because returns are unit free whereas prices are not. Following formula has been used to convert prices into returns.

$$\text{Returns} = (\text{Price}_t - \text{Price}_{t-1}) / \text{Price}_{t-1} \times 100.$$

Where as $\text{Price}_t = \text{Closing Price}$, $\text{Price}_{t-1} = \text{Opening Price}$.

It is important to note that J is formation period and K is holding period whereas J and K equal to 3, 6, 9, and 12 months. All stocks within “BIST 50” are

ranked into deciles based on their previous J-month return. Each month will give four individual portfolios because J equals 3, 6, 9, and 12 months. Top 10 performing stock will be chosen as winner portfolios (W) whereas bottom 10 worst performing stocks will be selected as loser portfolios (L). After that, these portfolios will be held for K subsequent months and K equals 3, 6, 9, and 12 months as they are equally weighted. Basically a rolling portfolio is formed. For instance, a J3K3 portfolio on 10 July, 2009 shows the stock performance from May to July and then it will be held till October. There are 16 momentum strategies in total that are being produced by this methodology i.e. 4J x 4K plus zero cost portfolio or momentum portfolio. Momentum portfolio is formed by going long in winner portfolio and going short in loser portfolio (W-L). Returns of momentum portfolios have been used to examine the existence of short term momentum effect and to measure the performance of momentum investment strategy.

3. Analysis

This section deals with the discussion of existence of momentum effect and interpretations of returns resulted from momentum investment strategies. The returns of momentum investment strategies have been compiled in the table below.

Table 1. Returns of short term momentum investment strategies

Formation period (J)		3	6	9	12
Winner	3	8.893811	8.388861	8.402833	9.20023
Loser		-2.88746	-3.19155	-0.65268	-1.796
Winner-loser		11.78127	11.58041	9.055509	10.99623
(t-stat)		52.22582	63.52777	69.90404	102.3075
Winner	6	6.897626	6.903792	7.442342	6.468872
Loser		-1.928	-1.611	-0.84384	-1.11901
Winner-loser		8.825631	8.514794	8.286178	7.587879
(t-stat)		47.66539	58.63538	75.74771	98.70898
Winner	9	6.074843	6.676655	5.848856	5.273987
Loser		-0.99485	-0.41751	-0.67636	-0.7525
Winner-loser		7.069694	7.094169	6.525216	6.026484
(t-stat)		55.54107	67.64445	80.80248	94.54068
Winner	12	6.380038	5.389299	4.964846	4.327518
Loser		0.313162	-0.33411	-0.43509	-0.77119
Winner-loser		6.066876	5.723413	5.399939	5.098704
(t-stat)		60.63895	66.60081	72.5738	82.52575

Source: Own calculation.

There are total 6 columns in the Table. First column shows the portfolios’ names i.e. winner and loser, second column shows J which is a formation period and equals 3, 6, 9 and 12 months whereas columns 3 to 6 show the returns of winner (w), loser (l) and winner-loser portfolios (w-l). The very first row shows K which represents holding period and equals 3, 6, 9 and 12 months. It is important to mention that numbers of months of formation period J are written

vertically whereas numbers of months for holding period K are written horizontally.

It can be observed from the table that results from all 16 momentum investment strategies are statistically significant and this finding gives strong support to the argument that short term momentum effect has been found in the stock market of Turkey and it is very strong or one can write that there is a

strong presence of momentum phenomenon in the Turkey's stock market. This argument further strengthens itself when it was found out from the above table that none of the strategy reported insignificant negative return. Mainly momentum investment strategy adds value to the portfolio by going short in loser portfolio. This pattern can be observed in many of the momentum strategies documented in the previous research papers on momentum effect in financial literature. Throughout the "Table: Returns of short term momentum investment strategies", it can be observed that winners are giving returns but losers are increasing the value of portfolios by selling short. This is particularly the main and basic feature of momentum investment strategy which further lends its support to the argument that short term momentum effect has been found in Borsa Istanbul. The highest return is posted by J3K3 momentum investment strategy which is 11.78% and it is statistically significant. It can be seen that return is significant and it is increased by 2.88% which is actually the return earned by going short in loser portfolio. This is a particular and traditional behavior of momentum investment strategy which only shows the momentum phenomenon exists in stock market of Turkey. The lowest return is 5.098% which is posted by J12K12 and the return is statistically significant. Same traditional pattern of momentum investment strategy can be observed in this portfolio as well. It is important to note that portfolios with shorter periods are giving high returns whereas portfolios with longer periods are giving low returns which means that short term momentum effect may fade away after 12 months. Because, it gets weaker as formation and holding period increases which again supports the definition of short term momentum effect phenomenon that momentum effect lasts for 3 to 12 months (Jegadeesh and Titman, 1993) and supports the argument that momentum effect exists in Turkey's stock market. Momentum investment strategies result in higher returns when formation and holding periods are low. It is because Turkey's economy is a growing economy and its stock market is an emerging one. So, investors have the opportunity to earn double figure returns by going long in winner portfolios and selling short loser portfolios. Other than J3K3 strategy, trading strategies in the J6 formation periods are also profitable. For instance, J6K3 strategy is posting a return of 8.82% which is the highest return in J6 formation family and this return is also statistically significant. It can be observed that all momentum investment strategies in J6 formation period are posting returns from 7% to 9% and all returns are statistically significant. It can

also be observed that all portfolios are behaving in a traditional and classic momentum strategy. Investor can also go for J6 formation period when it comes to maximize the value of portfolio. J9 and J12 formation period are also posting returns from 7% to 5%. Though these returns are less than what was posted by J3 formation period but their returns are still decent. Same pattern can also be observed in the investment strategies of J9 and J12 periods which mean that portfolio wealth has been maximized by going short in loser portfolios but, in these strategies, the returns of loser portfolios are less than 1% whereas the loser portfolios resulted in more than 2% returns in J3 formation period. It is important to notice that the returns of both winner and loser portfolios are relatively lesser than the returns of J3 formation period. Therefore, preference should be given to shorter time period momentum investment strategies while taking investment decisions.

It can be written that short term momentum effect has been found in the stock market of Turkey and this finding goes with the finding of Griffin, Ji and Martin (2005) who also found the existence of short term momentum effect in the stock market of Turkey and it also supports the findings of Jegadeesh and Titman (1993) and Rouwenhorst (1998, 1999) who also found the existence of short term momentum effect in the stock markets in their respective papers. Presence of short term momentum effect in the stock market of Turkey is a significant finding and this finding will have fruitful impact on this stock market. Its presence in this stock market establishes a strong notion that Borsa Istanbul works exactly on the lines of other developed stock markets and there can be chances of greater integration between this stock market and other developed stock markets of world particularly with the stock markets of Europe. Short term momentum effect has a strong presence in the stock market of Turkey and the momentum investment strategies behave exactly in a way in which they show their performance in other developed stock market. This paper's findings or results are in line with the paper of Ejaz and Polak (2015) as they also found the existence of short term momentum effect in Middle Eastern stock markets and these findings go against the findings of Li, Qiu and Wu (2010) who found out momentum strategies were not profitable in Chinese stock market. Future research should focus on the profitability of sub-variants of momentum investment strategies in the stock market of Turkey. Sub-variants of momentum investment strategies are weekly momentum strategies, trading volume momentum strategies etc. The return results found in this paper form price momentum strategy are applicable in real life scenario. An investor should be able to identify winner and loser stocks

from the stock market using the methodology discussed above then go long in winner and short in loser portfolios to earn returns.

4. Implication, limitations and future research

This paper provides evidence that short term momentum effect has been found in the stock market of Turkey so investor can use price momentum strategy discussed in this paper to earn fruitful returns but this strategy requires minimum 6 months to translate investment into returns. Although this study proves that momentum effect exists in the Turkey financial market but it has data only from 2008. It is not said for surety that momentum effect was there before 2008 and this is where this study has a limitation. Future research should focus on trading volume momentum strategy and weekly momentum strategy in the context of Turkey stock market in order to have more insights into the investment strategy.

Conclusion

This paper discusses the existence of short term effect which is still a debatable topic even after 23 years of its inception. Short term momentum effect was first unearthed by Jegadeesh and Titman (1993) and then it was examined by many authors for instance Rouwenhorst (1998, 1999) and Ejaz and Polak (2015). In all those years, existence of short term momentum effect remains questionable and authors have been documenting conflicting results about its existence. For instance, Hurn and Pavlov

(2003) reported that short term momentum effect has been found in the Australian stock market but Henker, Henker and Huynh (2010) wrote that there was no presence of momentum effect since 1970. There are two opposite statements coming out from two different papers about the same stock market and same phenomenon. Similarly, Griffin, Ji and Martin (2005) argued that stock market of Turkey exhibits momentum whereas Fernandes and Ornelas (2008) argued that Turkey's stock market does not display any kind of momentum. Again, there are two conflicting statements coming out from two different papers about the same stock market and same phenomenon. Therefore, Turkey's stock market has been chosen to examine the existence of short term momentum effect in this regard. Data have been downloaded from Datastream. It has been found that strong short term effect is existed in the stock market of Turkey. It has also been found that momentum phenomenon can last for 3 to 12 months. It is observed that momentum investment strategies are profitable for this stock market and they have posted statistically significant returns. All strategies are profitable but momentum strategies with shorter time period should be pursued to get double figure return. Future research should be focused on sub-variants of price momentum investment strategies in Turkey's stock market but it also focuses on finding the source of momentum profits which is also a debatable issue.

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