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Author(s): Zulfiqar Ali Imran, Woei-Chyuan Wong, Rusmawati Ismail

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Momentum Effect in Developed and Emerging Stock Markets

Zulfiqar Ali Imran[1*]
Woei-Chyuan Wong[1]
Rusmawati Ismail[1]

Abstract

The study aims to reaffirms the existence of short-term momentum effect in 13 developed and emerging stock markets where previous literature has lack of consensus on the issue. Although many studies emphasize on the existence of momentum effect, but still, there are substantial number of researchers that deny its presence. The contradictory findings of many researchers, over the existence of momentum effect, raises a serious question as to what extent our stock markets are informationally efficient and whether investors can make abnormal profits by using momentum investment strategies. This study applies momentum investment strategy, J6K6, to calculate momentum returns. Our study finds negative significant momentum effect in all 13 stock markets. Although momentum effect is present in 13 countries, yet investors are not able to attain abnormal profit through momentum investing. These findings have an utmost importance for practitioners that they should not adopt momentum investment strategies in these countries as these strategies are generating losses. Moreover, stock market regulators should formulate these markets on the notion of efficient market hypothesis.

Keywords: momentum effect, momentum investment strategies, existence of momentum effect, efficient market hypothesis
JEL Classification: G11, G12

Introduction

Short term momentum effect has been debated for long in the finance literature soon after the seminal work of Jegadeesh and Titman (1993) (here after J&T, (1993)). It is a stock market phenomenon which establishes that the stocks that have performed well in the recent past (winners) will continue to perform well in the future, and similarly, the stocks that have performed worse in the

[1]University of Utara Malaysia, Malaysia
[*] Corresponding author: zulfiqaraliimran05@gmail.com

recent past (losers) will keep performing worse. In other words, in the recent past, winners will remain winners and losers will remain losers for next 3 to 12 months. In the short run, winner will outperform the losers. J&T (1993) defined short term period as 3 to 12 months and find momentum investment strategies produce average monthly momentum returns around 1.49 percent per month in the US stock markets. Short-term momentum effect has been subject to many empirical studies ever since its inception. For instance, another of J&T (2001) study, the U.S market extended their time period as compared to their previous study. They reaffirm the return of the momentum in the U.S market but disappearing as momentum strategy expired due to the time. Rouwenhorst, (1999, 1998) study 20 Asian and 12 European stock markets, respectively. Likewise, Griffin, Ji and Martin (2005) also investigate short-term momentum effect in 39 countries around the globe. Similarly, Griffin, Ji and Martin (2003) study momentum effect under different economic conditions and find momentum effect can be profitable from 3 to 5 years. Zhang (2006) studies momentum effect in stock market under information uncertainty and states momentum effect is higher if stock markets are subject to greater information uncertainty.

In a nutshell, many authors confirm the presence of short-term momentum effect across many stock markets around the globe. Yet there is no unanimity over the existence of momentum effect and are still questionable. Different authors find conflicting results about the presence of momentum effect even in the same stock market. Hameed and Yuanto (2002) and Chui, Titman and Wei (2000) do not find momentum effect in 6 and 8 Asian stock markets, respectively, but Griffin, Ji and Martin (2005) and Chui, Titman and Wie, (2010) confirm momentum effect in some of the Asian stock markets. Furthermore, Li, Qiu and Wu (2010) study momentum effect in Chinese stock market and find non-profitable but, on the other hand, Kang, Liu and Ni (2002) establish momentum effect profitable in the Chinese stock market. Momentum effect in Turkey stock market is also controversial where Griffin, Ji and Martin (2005) prove the presence of momentum effect in the Turkish stock market which is later denied by Fernandes and Ornelas (2008). These conflicting results are not limited to emerging or developing

markets, as contradictory finding may be regard as influenced by high volatility and greater uncertainty in such markets, but there are some developed stock markets such as Australian and Japanese where momentum effect is also subject to many contradictions. For example – Chui, Titman and Wei (2010) and Hurn & Pavlov (2003) find strong momentum effect in Australia but Henker and Huynh (2010) do not find momentum effect in Australian stock market. Moreover, Henker and Huynh (2010) established that momentum effect is not present in Australian stock market since 1970. Hong, Lee and Swaminathan (2003) found insignificant momentum effect in Japan whereas Griffin, Ji & Martin (2003) found significant momentum effect in the Japanese stock market.

These contradictory findings of momentum effect for emerging and developed stock market in the literature about finance put a question market on the existence of short-term momentum effect around the world. Moreover, literature about finance lacks a comprehensive study, after Chui. Titman and Wei (2010) investigate and reaffirm the presence of momentum effect around the world. The objective of the current study is to reaffirm the existence of momentum effect in developed and emerging stock markets. For this purpose, current study identifies the emerging and developed stock markets that have contradicting finding on momentum effect. Another objective of this study is to identify the magnitude of profitability of momentum investment strategies.

It is also important to investigate existence of momentum effect as it is a direct violation of efficient market hypothesis. If markets exhibit momentum effect, they are no longer efficient because momentum effect propose that stocks past prices can be utilized to predict its future prices and can also lead investors to earn abnormal profit. Nevertheless, efficient market hypothesis articulate that investors cannot use information based on the past prices of the securities to make an abnormal profit, because stock future prices are random in nature and are not affected by previous events (Malkiel, 2003; Malkiel & Fama, 1970).

Rest of the paper is organised as section 2 presents literature review, section 3 explains data, section 4 describes the

methodology, section 5 shed lights on the empirical findings and section 6 concludes the study.

2. Literature Review

Despite the fact that momentum effect has been investigated and documented in many stock markets around the world for a long, its existence and significance have still been subject to many empirical disagreements. The literature review discusses two group of authors who establish the existence and significance of momentum effect in some emerging and developed stock markets whereas other group of authors completely deny the existence of momentum effect in the same stock markets.

Short-term momentum effect has long been remained a debating issue in the literature of finance ever since its inception. According to J andT (1993) study, the U.S stock market from 1965 to 1989 and document the presence of momentum effect producing 1.49 percent average monthly momentum returns. They identify the winners and losers in stocks based on their past six months cumulative returns to construct winner minus loser portfolio. These momentum investment strategies are based on formation and holding periods where both can be of 3, 6, 9 and 12 months. For example, winners and losers can be formed on the basis of past six months cumulative average returns and can be held for next six months to earn momentum profits. J and T (1993) states, there are 16 momentum investment strategies producing different level of profitability. However, J and T (1993) only calculated J6K6 momentum strategy where winner and loser are based on six months holding and formation period and declare J6K6 as representative strategy. As J andT (1993) study only focused the U.S stock market which raises a concern whether same returns continuation effect exists outside the U.S stock market or not.

This was further confirmed by Rouwenhorst, (1999, 1998) who study Asian and European stock market, respectively. Rouwenhorst (1998) analyse 2,190 firms from the period of 1978 to 1985 and documents that short-term momentum effect also exists into European stock markets such as in Austria, Belgium, Denmark, France, Germany, Italy, Netherlands, Norway, Spain, Sweden, Switzerland, and the United Kingdom. Author also find that past

winners are outperforming past losers by almost one percent per month in all 12 stock markets and this effect lasts for 12 months. Moreover, these momentum returns are negatively related, but not limited, to small firms. Although, Rouwenhorst (1998) study is considered the main evidence of momentum effect but the author completely ignore the emerging markets. Later on, Rouwenhorst, (1999) examines 20 emerging markets from countries such as Argentina, Brazil, Chile, Colombia, Greece, Indonesia, India, Jordan, Korea, Malaysia, Mexico, Nigeria, Pakistan, Philippines, Portugal, Taiwan, Thailand, Turkey, Venezuela and Zimbabwe and confirms the existence of momentum returns in 1,750 firms across 17 out of 20 countries. Author applies J and T (1993) momentum methodology and calculate J6K6 as representative strategy.

Many studies have provided ample amount of evidence of existence of momentum effect but, on the other hand, there are also numerous studies that contradicts the existence of short-term momentum effect. Chui, Titman and Wei (2000) examine eight Asian stock markets, they are; Hong Kong, Malaysia, Indonesia, Taiwan, Korea, Thailand, Japan and Singapore. They find short-term momentum effect in Hong Kong, Malaysia, Singapore and Thailand but momentum effect is not present in Indonesia, Japan, Taiwan and Korea. Due to unavailability of data, they use different time periods for each country such as Japan data starts from 1997 to 2000, data for Korea stock market starts from 1995 to 2000 and similarly other countries data start from 1998 to 2000. Moreover, study lacks the generalizability as they only consider eight Asian countries.

The existence of short-term momentum effect is further challenged by Hameed and Yuanto (2002) who study almost 1000 firms in six Asian stock markets, comprising of Hong Kong, Malaysia, Singapore, South Korea, Taiwan and Thailand. They apply J and T (1993) momentum methodology but winner minus loser portfolio is not producing significant momentum returns. They conclude all 16 momentum strategies are consistently insignificant in six Asian stock markets. Moreover, Hameed and Yuanto (2002) state momentum effect is the result of data snooping bias. They also conclude that momentum effect is not the reward of risk because CAPM does not explain the momentum effect in any of the six Asian

countries. Similarly, momentum effect is not present in Brazil, Indonesia, Australia, Pakistan, Poland, Romania and Turkey (Ornelas & Fernandes, 2008). They re-examine the existence of momentum effect by applying J and T (1993) methodology with the exception to take 25 percent losers and 25 percent winners form winner minus loser portfolio rather than only 10 percent. They concluded that improvement in information technology and use of internet help information spread across investors with greater speed that wipe out the effect of momentum. But this contradicts the previous studies as previous literature establishes higher momentum effect in the developed countries. If higher information technology and use of internet is wiping out the momentum effect, then developed counties should have lower momentum effect as compared to developing countries due to higher use and excess to internet and information.

Momentum effect is not found in Australian stock market (Huynh, Henker, & Henker, 2010). Authors study the market from 1993 to 2008 and include listed and delisted companies. The study criticizes the momentum methodology that underestimates the implicit assumption leading to bias towards momentum effect. Study further finds that momentum effect is not even robust to different sampling periods and establishes momentum effect that may be the result of look-ahead bias during sampling process.

Although substantial amount of literature on momentum favours existence of significant momentum effect in many countries around the world but there are also many studies that contradict the previous findings, especially in the context of emerging markets. The existence of momentum effect in emerging market is not unanimous among researchers. Moreover, no study is found discussing momentum returns around the world after Chui Titman and Wei (2010). It is important to reaffirm the existence of short-term momentum effect for countries where presence of momentum effect is highly controversial. Table 1 presents the list of countries, along with researchers, that have so far been investigated for the existence of momentum effect. Panel A of table 1 enlists those countries where most of the researcher have some unanimity over the presence of momentum effect, nevertheless, panel B shows countries where researchers do not find momentum returns. Most of the countries

enlisted into panel are A and B, simultaneously, because different researchers find contradictory findings. The current study will pick up the countries which have lack of consensus over existence of momentum effect.

Table 1
Countries and Momentum Returns

Panel A. List of Countries with Significant Momentum Returns	
Countries	Authors
Argentina	Rouwenhorst (1999); Chui, Titman & Wei (2010); Griffin, Ji & Martin (2003)
Africa	Griffin, Ji & Martin (2003)
Australia	Griffin, Ji & Martin (2003)
Austria	Rouwenhorst (1998); Chui, Titman & Wei (2010); Griffin, Ji & Martin (2003)
Bangladesh	Chui, Titman & Wei (2010)
Belgium	Rouwenhorst (1998); Chui, Titman & Wei (2010); Griffin, Ji & Martin (2003)
Brazil	Rouwenhorst (1999); Chui, Titman & Wei (2010); Griffin, Ji & Martin (2003)
Canada	Chui, Titman & Wei (2010); Griffin, Ji & Martin (2003)
Chile	Rouwenhorst (1999); Chui, Titman & Wei (2010); Griffin, Ji & Martin (2003)
China	Griffin, Ji & Martin (2003)
Colombia	Rouwenhorst (1999)
Denmark	Rouwenhorst (1998); Chui, Titman & Wei (2010); Griffin, Ji & Martin (2003)
Egypt	Griffin, Ji & Martin (2003)
Finland	Griffin, Ji & Martin (2003)
France	Rouwenhorst (1998); Chui, Titman & Wei (2010); Griffin, Ji & Martin (2003)
Germany	Rouwenhorst (1998); Chui, Titman & Wei (2010)
Greece	Rouwenhorst (1999); Chui, Titman & Wei (2010)
Hong Kong	Griffin, Ji & Martin (2003)

Panel A. List of Countries with Significant Momentum Returns	
Countries	Authors
India	Rouwenhorst (1999); Chui, Titman & Wei (2010); Griffin, Ji & Martin (2003)
Indonesia	Rouwenhorst (1999); Griffin, Ji & Martin (2003)
Ireland	Griffin, Ji & Martin (2003)
Israel	Chui, Titman & Wei (2010)
Italy	Rouwenhorst (1998); Chui, Titman & Wei (2010); Griffin, Ji & Martin (2003)
Italy	Rouwenhorst (1998); Chui, Titman & Wei (2010); Griffin, Ji & Martin (2003)
Japan	Griffin, Ji & Martin (2003)
Jordan	Rouwenhorst (1999)
Korea	Rouwenhorst (1999)
Malaysia	Rouwenhorst (1999); Griffin, Ji & Martin (2003)
Mexico	Rouwenhorst (1999); Griffin, Ji & Martin (2003)
Netherlands	Rouwenhorst (1998); Chui, Titman & Wei (2010); Griffin, Ji & Martin (2003)
New Zealand	Griffin, Ji & Martin (2003)
Nigeria	Rouwenhorst (1999)
Norway	Rouwenhorst (1998); Chui, Titman & Wei (2010); Griffin, Ji & Martin (2003)
Pakistan	Rouwenhorst (1999); Chui, Titman & Wei (2010); Griffin, Ji & Martin (2003)
Peru	Griffin, Ji & Martin (2003)
Philippines	Rouwenhorst (1999); Chui, Titman & Wei (2010); Griffin, Ji & Martin (2003)
Poland	Chui, Titman & Wei (2010)
Portugal	Rouwenhorst (1999); Griffin, Ji & Martin (2003)
Singapore	Griffin, Ji & Martin (2003)
South Africa	Griffin, Ji & Martin (2003)
Spain	Rouwenhorst (1998); Chui, Titman & Wei (2010); Griffin, Ji & Martin (2003)

Panel A. List of Countries with Significant Momentum Returns	
Countries	Authors
Sweden	Rouwenhorst (1998); Chui, Titman & Wei (2010); Griffin, Ji & Martin (2003)
Switzerland	Rouwenhorst (1998); Chui, Titman & Wei (2010); Griffin, Ji & Martin (2003)
Taiwan	Rouwenhorst (1999); Griffin, Ji & Martin (2003)
Thailand	Griffin, Ji & Martin (2003)
Turkey	Rouwenhorst (1999); Griffin & Martin (2003)
United Kingdom	Rouwenhorst (1998); Chui, Titman & Wei (2010); Griffin, Ji & Martin (2003)
Venezuela	Rouwenhorst (1999)
Zimbabwe	Rouwenhorst (1999)
Hong Kong	Hameed & Yuanto (2002).
Malaysia	Hameed & Yuanto (2002).
Singapore	Hameed & Yuanto (2002).
South Korea	Hameed & Yuanto (2002); (Chui, Titman & Wei 2000)
Taiwan	Hameed & Yuanto (2002).
Thailand	Hameed & Yuanto (2002).
Japan	(Chui, Titman & Wei 2000); (Teplova & Mikova 2015)
Indonesia	(Fernandes & Ornelas 2008); (Chui, Titman & Wei 2000)
Australia	Henker, Henker & Huynh (2010)
Brazil	Fernandes & Ornelas (2008)
Pakistan	Fernandes & Ornelas (2008)
Poland	Fernandes & Ornelas (2008)
Romania	Fernandes & Ornelas (2008)
Turkey	Fernandes & Ornelas (2008)

3. Data

We drewthe monthly stock price data from DataStream from 1996 to 2018 for 13 countries; Turkey, Poland, Pakistan, Brazil, Australia, Indonesia, Japan, Thailand, Taiwan, South Korea, Singapore,

Malaysia and Hong Kong. These 13 countries are selected based on section B in table 1 where previous studies have no consensus over the existence of short-term momentum effect. The DataStream provide monthly stock price data for 13 countries from 1996. Increasing the sample period results into lower number of sample countries. Table 2 shows number of firms belonging to each country and number of firms that are retained for further analysis.

Table 2
Number of Firms

Countries	Total No. of Firms	Firm Retained
Australia	2172	380
Brazil	610	156
Indonesia	629	171
Japan	1174	481
Hong Kong	3336	453
Malaysia	965	303
Pakistan	365	21
Poland	820	21
Singapore	522	113
South Korea	2378	473
Taiwan	1970	284
Thailand	1242	413
Turkey	394	142
Total No. of Firms	16,577	3,411

Table 2 shows total number of firms are 16,577, however, due to screening process only 3,411 firms are used for further analysis. We remove all the firms if they are discontinued or stock prices are missing for any month.

4. Methodology

We applied momentum investment methodology developed by J and T (1993). J andT (1993) momentum strategy stands as a benchmark to calculate momentum returns (Chui, Titman, & Wei, 2010; Griffin, Ji, & Martin, 2003; Ji, Martin, & Yao, 2017; Rouwenhorst, 1998). The first step is to calculate stock returns for each firm of respective country through following formula.

$$Returns = \left(\frac{P_t - P_{t-1}}{P_{t-1}}\right) * 100$$

where, P_t stands for closing price on a date in a month t and P_{t-1} is opening price on the same date in month t-1.

The next step it to calculate cumulative average monthly returns for all the firms, which is nominated as formation period "J". Since we are applying J6K6 representative strategy that is why the formation period is based on previous 6 months. The performance of each stock is observed based on the last 6 months cumulative average returns of respective stock. Then the stocks returns were sorted into ascending orders to identify winner and losers. The top 10 percent of the stocks in each stock markets are winners and bottom 10 percent of the stocks are losers.

After identifying winners and losers' portfolios based on their previous 6 months performance, we will hold the same winners and losers for next six subsequent months, which is called holding period and is represented by letter "K". To construct the winner minus loser portfolio we will take the average of winner and loser portfolio in each month from 1996 to 2018 and subtract the average loser from the average winner portfolios. The average value of winner minus loser portfolios is the momentum returns. The stock market is said to experience momentum effect if the t-statistics associated to momentum returns are significant.

5. Empirical Results

This section shows and discusses whether sample countries exhibit momentum effect or not. Table 3 provides the average monthly momentum returns across all the 13 countries in the third column and t-statistics is provided in the fourth column. Second column shows respective countries and sample periods. The sample period is divided into three sub samples. Full sample period, first sub-sample period and second sub-sample period, show average monthly momentum returns from 1997 to 2018, 1997 to 2006 and 2007 to 2018, respectively. Section A of table 3 shows average monthly momentum returns for each individual country pertaining to each sample period. Study confirms the existence and significance of momentum effect in Poland, Singapore and Thailand

in all the sample periods. These findings are contradictory to Hameed & Yuanto, (2002) and Fernandes & Ornelas, (2008) who find absence of momentum effect in these countries. Overall, our findings are in line with Chui, Titman & Wei, (2010) and Griffin, Ji & Martin, (2003). Taiwan exhibits positive but insignificant momentum effect in full sample period, positive and significant in first sub-sample period and negative significant in second sub-sample period. These finding are unique in its nature as previous studies completely deny the existence of momentum effect in Taiwan. Panel B of table 3 shows the overall average monthly momentum returns. Overall momentum effect is significant in the 13 countries that favour those streams of researchers who approve the existence of momentum effect.

Table 3 also reveals that momentum effect drastically changes from full sample period to first and second sub-sample period along with the level of significance for each country. Moreover, momentum returns in Taiwan stock market also confirm that momentum effect does not remain present in stock markets all the time. In some periods, momentum effect is higher and significant but it disappears if we change the sample period. Overall, our finding is consistent with DHS, (1998) model that states when information fully reflects into stock prices, momentum effects disappear.

Table 3
Average Monthly Momentum Returns

S. No	Countries	Average Monthly Momentum Profits (%)	T-Stat
Panel A: Country Wise Average Monthly Momentum Returns			
1	Australia		
	Full Sample (1996 to 2018)	-2.30	-10.15
	First Sub-Sample (1996-2006)	-4.86	-19.25
	Second Sub-Sample (2007-2018)	-0.17	-2.58
2	Brazil		
	Full Sample (1996 to 2018)	-5.36	-22.07

S. No	Countries	Average Monthly Momentum Profits (%)	T-Stat
Panel A: Country Wise Average Monthly Momentum Returns			
	First Sub-Sample (1996-2006)	-7.14	-21.30
	Second Sub-Sample (2007-2018)	-3.88	-22.72
3	Hong Kong		
	Full Sample (1996 to 2018)	-3.55	-29.76
	First Sub-Sample (1996-2006)	-3.10	-22.14
	Second Sub-Sample (2007-2018)	-3.93	-34.94
4	Indonesia		
	Full Sample (1996 to 2018)	-37.42	-52.64
	First Sub-Sample (1996-2006)	-64.34	-37.06
	Second Sub-Sample (2007-2018)	-14.99	-65.63
5	Japan		
	Full Sample (1996 to 2018)	-2.01	-32.85
	First Sub-Sample (1996-2006)	-0.89	-18.92
	Second Sub-Sample (2007-2018)	-2.94	-44.45
6	Malaysia		
	Full Sample (1996 to 2018)	-13.92	-45.40
	First Sub-Sample (1996-2006)	-20.08	-33.70
	Second Sub-Sample (2007-2018)	-8.78	-55.15
7	Pakistan		
	Full Sample (1996 to 2018)	-6.46	-18.85
	First Sub-Sample (1996-2006)	-13.15	-36.78
	Second Sub-Sample (2007-2018)	-0.88	-3.91
8	Poland		
	Full Sample (1996 to 2018)	9.23	6.86
	First Sub-Sample (1996-2006)	12.86	9.59
	Second Sub-Sample (2007-2018)	6.20	4.60
9	Singapore		
	Full Sample (1996 to 2018)	9.23	6.85
	First Sub-Sample (1996-2006)	12.86	9.56

S. No	Countries	Average Monthly Momentum Profits (%)	T-Stat
Panel A: Country Wise Average Monthly Momentum Returns			
	Second Sub-Sample (2007-2018)	6.20	4.59
10	South Korea		
	Full Sample (1996 to 2018)	-2.15	-12.18
	First Sub-Sample (1996-2006)	-2.64	-9.77
	Second Sub-Sample (2007-2018)	-1.74	-14.19
11	Taiwan		
	Full Sample (1996 to 2018)	0.29	-1.35
	First Sub-Sample (1996-2006)	4.41	14.03
	Second Sub-Sample (2007-2018)	-3.14	-14.17
12	Thailand		
	Full Sample (1996 to 2018)	0.71	5.51
	First Sub-Sample (1996-2006)	1.47	10.48
	Second Sub-Sample (2007-2018)	0.07	1.37
13	Turkey		
	Full Sample (1996 to 2018)	-11.90	-33.22
	First Sub-Sample (1996-2006)	-13.84	-34.68
	Second Sub-Sample (2007-2018)	-10.28	-32.00
Panel B: Overall Average Monthly Momentum Returns in 13 Countries			
	All Countries		
	Full Sample (1996 to 2018)	-5.05	-18.40
	First Sub-Sample (1996-2006)	-7.57	-14.61
	Second Sub-Sample (2007-2018)	-2.94	-21.48

Source: Author's own calculation

6. Conclusion and Recommendation

The study aims to test whether short-term momentum effect exists in the developed and emerging stock markets. For this purpose, study selects the countries where previous literature has lacked consensus over the existence of momentum effect. Overall, our

finding confirms that momentum effect does exist in 12 out of 13 countries. Investors cannot attain abnormal profit by using momentum investment strategies as J6K6 is producing negative insignificant momentum returns in most of the countries. Our study has a great significance towards efficient market hypothesis because previous literature suggests that existence of momentum effect is a negation of efficient market hypothesis. We conclude that mostly markets are informationally efficient and where momentum effect exists such as Taiwan, stock markets tend to move towards efficiency when information defuses into stock prices. Momentum effect is the phenomenon related to a slower adjustment process of information into stock prices. The momentum effect appears when information arrives till the time when information is fully reflected into stock prices (DHS, 1998). Obviously, these results are not conclusive for other countries because of the smaller sample size and covers only 22 years of data.

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