MOMENTUM AND INVESTOR SENTIMENT:

EVIDENCE FROM ASIAN STOCK MARKETS

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MOMENTUM AND INVESTOR SENTIMENT: EVIDENCE FROM ASIAN STOCK MARKETS

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ABSTRAK

Momentum merupakan suatu anomali yang terkenal dalam pasaran saham, akan tetapi ia masih belum dijelaskan dengan lengkap. Walaupun momentum dikaji secara meluas di pasaran Amerika Syarikat (AS) dan pasaran lain, namun tidak terdapat banyak literatur berkaitan pasaran saham Asia. Tambahan pula, tiada kajian dijalankan tentang kesan sentimen terhadap momentum di luar pasaran AS. Kajian ini berhasrat mengisi jurang ini. Yang menariknya, kajian ini merupakan yang pertama mencadang serta mengkaji pengaruh sentimen global dan sentimen tempoh-pemegangan terhadap momentum. Tesis ini pertamanya menguji jika momentum sedia ada pada 13 buah negara Asia (Bangladesh, China, Hong Kong, India, Indonesia, Jepun, Malaysia, Pakistan, Filipina, Singapura, Korea Selatan, Taiwan and Thailand) dengan menggunakan data dari Januari 2000 hingga Disember 2011. Kedua, kesan saiz firma dan jumlah dagangan terhadap momentum juga diuji. Akhir sekali, bahagian penting tesis ini adalah mengkaji kesan sentimen terhadap momentum. Khususnya, kesan sentiment tempatan, global dan tempoh pemegangan dikaji. Pada purata, momentum didapati wujud di Asia. Berasaskan kajian setiap negara, pulangan portfolio momentum adalah positif dan signifikan bagi hampir satu pertiga daripada negara-negara tersebut. Pengasingan sampel berdasarkan saiz, jumlah dagangan dan sentimen didapati meningkatkan momentum. Apabila diambil kira sentimen dan saiz firma, hampir kesemua negara (kecuali sebuah) mempunyai momentum. Dapatan kajian ini menunjukkan bahawa sentimen memainkan peranan yang penting dalam manifestasi momentum. Bagi sentimen tempatan, tiada

momentum semasa tempoh pesimistik. Ia wujud hanya semasa tempoh optimistik dan sederhana. Secara amnya, keputusan yang sama ditemui bagi analisis sentimen global dan sentimen tempoh–pemegangan. Kesimpulan kekal tidak berubah selepas saiz firma, jumlah dagangan dan risiko dikawal. Dapatan juga tetap kukuh dengan pengubahan pengelasan sentimen, bentuk pembinaan portfolio dan proksi sentimen. Di samping itu, saiz firma dan jumlah dagangan juga mempengaruhi keberuntungan momentum. Pulangan portfolio momentum bagi saham yang kecil adalah tidak signifikan. Sahan bersaiz sederhana (serta juga bagi firma yang saiz besar, pada had tertentu) adalah menguntungkan. Secara amnya, saham volum tinggi menjana momentum yang lebih tinggi daripada saham volum rendah. Terdapat pelbagai implikasi daripada penemuan kajian pada tesis ini. Bukti mencadangkan bahawa penjelasan berdasarkan tingkah laku *(behavioral-based)* telah menjanakan momentum dengan itu memberi sokongan pada penjelasan mengikut tingkah laku kewangan *(behavioral finance)*. Dapatan ini boleh bertindak sebagai panduan bagi strategi pelaburan berdasarkan momentum di Asia. Sekiranya para pelabur ingin melabur di Asia, maka saham bervolum rendah dan bersaiz kecil sepatutnya dielakkan apabila menggunakan strategi pelaburan berdasarkan momentum. Para pelabur harus mengelak dari membuat pelaburan pada tempoh pesimistik dan melabur semasa tempoh sentimen yang tinggi dan / atau sederhana.

MOMENTUM AND INVESTOR SENTIMENT: EVIDENCE FROM ASIAN STOCK MARKETS

ABSTRACT

Momentum is a well-known stock market anomaly that has yet to be fully explained. Though momentum has been widely examined in the US and other markets, literature on Asian stock markets is sparse. Moreover, effect of sentiment on momentum has not been investigated in non US markets. This study hopes to fill the identified gaps. Notably, this study is the first to propose and investigate the influence of global and holding period sentiments on momentum. This thesis firstly explores the presence of momentum in 13 Asian countries (Bangladesh, China, Hong Kong, India, Indonesia, Japan, Malaysia, Pakistan, Philippines, Singapore, South Korea, Taiwan and Thailand) using data from January 2000 to December 2011. Secondly, effect of firm size and trading volume on momentum are tested. Finally, the pivotal part of the thesis is the analysis of the effect of sentiment on momentum. Specifically, the effects of local, global and holding period sentiments are investigated. On average, momentum is found to be present in Asia. On an individual country basis, momentum portfolio returns are predominantly positive and statistically significant for approximately one third of the countries. Segregation of the sample by size, volume and sentiment further showed increases in momentum. Taking into consideration sentiment and firm size yields the most promising results wherein all but one country had momentum. The findings reveal that sentiment plays a crucial role in the manifestation of momentum. For local sentiment, momentum is absent during pessimistic period. Momentum is present only for optimistic and mild

periods. Similar results are generally found for the analysis on global and holding period sentiments. The conclusions remain intact after controlling for firm size, trading volume and risk. The findings are also robust to changes in sentiment classification, portfolio construction, and sentiment proxies. In addition, firm size and trading volume also influence momentum profitability. Momentum portfolio returns for small stocks are not significant. Medium-sized stocks (and to an extent large firms) are profitable. High volume stocks generally generate higher momentum than low volume stocks. There are varied implications that could be derived from results of this thesis. The evidence suggests that a behavioural-based explanation of momentum is likely and also lends credence to behavioural finance. The findings could serve as a guide on momentum investing in Asia. If investors seek to invest in Asia, low volume and small stocks should be avoided for the momentum strategy. Investors should stand clear of pessimistic periods and preferably invest during period of high and/or mild sentiment.

"Sentiment is intellectualized emotion; emotion precipitated, as it were, in pretty crystals by the fancy."

- James Russell Lowell

CHAPTER ONE

INTRODUCTION

1.0 Research Background

The efficient market hypothesis (EMH) postulates that stock prices reflect all publicly available information at any given point in time. Changes in stock prices occur only at the wake of new information. When news arrives, it is instantaneously incorporated into and reflected in the stock prices. Investor's trades are not driven by irrational urges, clouded or misguided judgment. However, empirical evidence of stock market behavior implies otherwise. Deviations from stock market fundamentals are observed in practice. Countless studies have documented violations of EMH such as the size and value effect. These anomalies have been uncovered not only in the US stock market but also all across the world. Though the presence and consistency varies from one market to another, the existence of anomalies in stock markets is undeniable.

One such anomaly that has withstood the test of time and accusations of data mining is momentum[1]. Within the large body of literature that documents return predictability, momentum is arguably one of the most important and intriguing. It is one of the few anomalies that have yet to be explained in its entirety. In fact, Fama

[1] As defined by Schneider and Gaunt (2011), momentum is "the tendency of stock prices to move in a future direction that is consistent with some past movement" (p. 1).

(1998) acknowledged momentum as one of the most difficult anomalies to account for. The momentum effect was first documented by Jegadeesh and Titman (1993) in their seminal article entitled "Returns to Buying Winners and Selling Losers: Implications for Stock Market Efficiency". The authors documented that stocks which performed poorly (well) in the past continue to perform poorly (well) in the future. The basic concept of momentum strategy is to buy 'winners' (stocks that performed well in the past) and sell 'losers' (stocks that performed poorly in the past). The classification of losers and winners is based on the performance of the stocks during the past 3 to 12 months. In momentum strategy, the zero cost portfolio (winner minus loser portfolio) is maintained for the following 3 to 12 months. Using this simple and yet effective strategy, the authors were able to generate about 1% of profit per month. Following Jegadeesh and Titman's study, numerous studies have confirmed the existence of momentum effect in the US stock market (Asem, 2009; Asem & Tian, 2010; Bhootra, 2011; Blitz, Huij & Martens, 2011; Bulkley & Nawosah, 2009; Chordia & Shivakumar, 2006; Korajczyk & Sadka, 2004; Stivers & Sun, 2010; Wang & Wu, 2011). The findings of significant momentum profit caused an uproar as it goes against the concept of market efficiency. Under the dictates of EMH, stock prices correctly reflect all available information at any given time and new information is incorporated instantaneously into prices. Past price data is of no relevance and cannot be utilized to predict future prices. In short, past price data cannot be exploited.

Naturally, proponents of EMH argue that the observed momentum effect could be attributed to risk. However, risk based explanations have failed to fully account for the momentum effect. Avramov and Chordia (2006), Fama and French

(1996) and Grundy and Martin (2001) among others demonstrate that momentum cannot be fully explained by risk. Following the failure of risk models, a number of primarily behavioral based explanations have been put forth in an attempt to explain momentum. Of the more well known and frequently cited behavioral based models for momentum, Barberis, Shleifer, and Vishny (1998) focus on representativeness, Daniel, Hirshleifer, and Subrahmanyam (1998) model is based on investor overconfidence whereas Hong and Stein (1999) explain momentum in terms of slow information diffusion and the resulting underreaction and subsequent reversals. Researchers have also attributed momentum to a variety of other factors including cross sectional dispersion in expected returns (Bulkley & Nawosah, 2009), industry factors (Moskowitz & Grinblatt, 1999), transaction costs (Lesmond, Schill & Zhou, 2004) and market state (Cooper, Gutierrez & Hameed, 2004). Despite attempts over the decades, no one theory has been able to satisfactorily provide an explanation for the momentum effect. Momentum continues to be actively investigated to this date.

The momentum strategy of buying winning stocks and selling losing stocks has been, to a large extent, successful in many international markets such as the UK (Hon & Tonks, 2003), Australia (Schneider & Gaunt, 2011), New Zealand (Trethewey & Crack, 2010) and Europe (Rouwenhorst, 1998) including Sweden (Parmler & Gonzalez, 2007) and Italy (Mengoli, 2004). The worldwide support further lends credence to the momentum effect and rebukes claims of data mining. However, there is a glaring lack of momentum in Asian countries. Mentioned in passing, this apparent oddity in momentum literature has been widely neglected. Hameed and Kusnadi (2002) could not find any significant momentum profits in Hong Kong, Malaysia, Singapore, South Korea, Taiwan, and Thailand stock markets.

Country-neutral strategy did yield profits of 0.37% per month but the profits eroded after taking into account firm size and turnover factors. In an extensive study covering 39 countries, Griffin, Ji and Martin (2003) noted that Asian markets in general have lower momentum than the rest of the world. Moreover, when the 1 month lag between formation and holding period is removed, there is no significant profit for the Asian market (but the profit for the rest of the regions remains significant). However, a recent study by Naughton, Truong and Veeraraghavan (2008) uncovered the presence of strong momentum profits in the Chinese stock market for the period 1995 to 2005. Similarly, Cheng and Wu (2010) found significant momentum for the Hong Kong stock market from 1980 to 1999. The strategy with 6-month formation and holding period yielded significant returns of 1.15% and 1.07% for the equally weighted and value weighted portfolios respectively. This is comparable to the profits found in the US (Jegadeesh & Titman, 1993). Thus, levels of momentum returns across Asian markets appear to exhibit high variation. Malaysia and Singapore recorded virtually no momentum (Hameed & Kusnadi, 2002), negative returns (insignificant) were found for Taiwan (Ryan & Curtin, 2006) and on the other end of the spectrum highly significant momentum has been recorded in Hong Kong (Cheng & Wu, 2010). Unlike the US market, there is continuing debate not only on the underlying theory but also on the very existence of momentum in Asia.

As discussed above and further expanded in the next section, there are unresolved issues surrounding momentum and notable gaps in momentum literature. This study hopes to systematically address these issues. First, the existence of momentum in Asia is determined. For this purpose, a sample of 13 Asian stock

markets, Bangladesh, China, Hong Kong, India, Indonesia, Japan, Malaysia, Pakistan, Philippines, Singapore, South Korea, Taiwan and Thailand, are examined from January 2000 to December 2011.

After documenting the momentum profits that are present in the respective Asian markets, the factors that might influence momentum profitability are explored. Two factors that have been identified in prior literature are examined; specifically firm size and trading volume. First, momentum effect is disentangled from the size effect. Firm size has been documented to influence momentum but the nature of the relationship is up for debate (Brailsford & O'Brien, 2008; Mengoli, 2004). Trading volume has also been suggested in past studies (Lee & Swaminathan, 2000; Naughton et al., 2008) but again the evidence is inconclusive. The examination of firm size and volume are in part motivated by the results of Hameed and Kusnadi (2002). Though momentum was not present in Taiwan, taking into account firm size yielded significant momentum returns of 0.84%. Similarly the overall momentum return for Malaysia was insignificant. However, segregating the stocks into high and low volume stocks revealed that a significant momentum return of 1.54% could be generated for high volume stocks. In other words, momentum was present in Malaysia but restricted to high volume stocks. Therefore, firm size and trading volume are also examined in this study in case momentum profitability exists in Asia but is offset by the returns of low volume or small stocks or alternatively if momentum exists only in a specific group of stocks.

The primary focus of this thesis is investor sentiment. Sentiment is proposed as one of the factors that could affect momentum. Investor sentiment, as proxied by consumer confidence index, has been shown to influence future stock returns (Schmeling, 2009). Higher sentiment is linked to a lower stock returns in the future. However, the predictive power of sentiment ranges from strong to none depending on the stock market being investigated. A variety of studies have surged linking sentiment and other aspects of the stock market from IPO prices to feedback trading (e.g. Ben-Rephael, Kandel & Wohl, 2012; Chau, Deesomsak & Lau, 2011; Cornelli, Goldreich & Ljungqvist, 2006; Küçükaslan & Çelik, 2010; Liao, Huang & Wu, 2011). In a recent study, Antoniou, Doukas and Subrahmanyam (2013) found higher momentum during periods of high investor sentiment compared to low sentiment. As highlighted by Schmeling (2009), the effect of sentiment varies from country to country, and as such the relationship between momentum and sentiment needs to be reexamined in Asian markets.

To the best of my knowledge, the relationship between momentum and sentiment has been examined only in the US market. The study by Antoniou et al. (2013) is the first to conduct a specific and detailed examination of sentiment and momentum. It is needless to say, the literature is very sparse. International evidence in support or against the existing results would provide much needed insight into the issue. In addition to this, global sentiment and sentiment during portfolio holding period is also hypothesized to have an effect on momentum returns and is investigated accordingly. This study is the first to explore the effect of global sentiment on momentum. Similarly, holding period sentiment too has not been explored prior to this study.

The intention of this thesis is foremost to examine the link, if any, between sentiment and momentum. The other investigations conducted in this thesis are also of notable significance. The current level of momentum in Asia is assessed given the potential theoretical and practical implications of the findings (this will be explored in subsequent sections). It also lays the foundation for the sentiment analysis. The exploration of the effect of firm size and trading volume on the level of momentum profitability follows closely on the aim of finding a profitable momentum strategy in Asia and the findings may also be of theoretical relevance.

1.1 Problem Statement

In spite of the large body of evidence supporting the existence of momentum in US and Europe, the presence of momentum is ambiguous in Asian markets. Hameed and Kusnadi (2002) and Ryan and Curtin (2006) found little or no evidence of momentum in Asian markets. While these earlier studies have generally found little or no momentum, later studies focusing on individual stock markets have brought to light economically and statistically significant momentum profits (see Naughton et al., 2008; Cheng & Wu, 2010). Contradictions in the results of these studies may have been caused by the differences in time period covered by the study. If momentum profits in Asia are dependent on time period, then it is of interest to examine whether there is momentum in the current time period. While momentum is more or less confirmed to exist in the US and other markets, the issue is still unresolved in Asia. This creates a necessity to reexamine momentum in Asia.

Prior studies focusing on Asian markets have primarily concentrated on a small number of Asian countries. For example, Hameed and Kusnadi (2002)

examined only six Asian stock markets whereas Ryan and Curtin (2006) opted for seven markets. Additionally, there is an overlap between the countries selected in the studies. Moreover momentum based research is limited in Asian markets in terms of depth and coverage when compared with the diverse array of US market based studies. US based studies delve into the various factors affecting and driving momentum. Arguably, Asian market studies are, to a large extent, superficial glances at the phenomenon.

In particular, the relationships between firm size and trading volume on momentum have not been extensively tested in Asia. These two factors have been noted to influence momentum but the nature of the effect is debatable; past studies have documented contradictory findings. The examination of these factors could provide valuable information on the practical implementation of the momentum strategy and offer a clue on the underlying cause of momentum. Based on the past study by Hameed and Kusnadi (2002), the lack of momentum in Asia could even be linked to these two factors.

Moreover, the effect of sentiment on investor sentiment has yet to be investigated in Asia. Investor sentiment was found to be positively related to momentum in the US (Antoniou et al., 2012) but this relationship may or may not hold in Asia. Manifestation of momentum in Asia drastically differs from other regions around the world (Griffin et al., 2003). So much so that Hameed and Kusnadi (2002) argued that the factors that drive momentum in Asia may not be the same as those in the US. More importantly, the psychology of Asians is notably distinct from Westerners. This includes perception (Ishii, Tsukasaki, & Kitayama,

2009), reasoning (Buchtel & Norenzayan, 2008) and modes of thinking (Nisbett, 2003). Hedden, Ketay, Aron, Markus, and Gabrieli (2008) showed that individuals from America and Asia have distinct brain activity patterns when exposed to the same visual problems. Functional magnetic resonance imaging (fMRI) scans revealed higher brain activity for Americans when solving problems involving relative judgement compared to absolute judgement. On the other hand, the reverse was true for East Asians. In another study, the frontal cortex was found to be thicker for westerners than East Asians (Park & Huang, 2010). Given these clear distinctions, the question arises as to whether sentiment would still be related to momentum in Asia and if so what would be the nature of the relationship.

1.2 Research Questions

The aforementioned unresolved issues and potential areas of research lead to the formulation of four research questions. The research questions are listed successively 1 to 4. The order of listing is not indicative of the relative importance of the questions but rather follows the sequence of analysis conducted in this thesis. The crucial question that is hoped to be answered pertains to investor sentiment. Whilst sentiment was documented to influence momentum in the US, the relationship has not been investigated in non-US markets. Momentum and psychology of investors in Asia differ from those in Western countries. Thus, it is necessary to examine sentiment in Asia and the final question addresses this issue.

1. Is momentum present in the Asian stock market?
2. Does firm size affect the level of momentum profitability in Asia?
3. Is the level of momentum in Asia influenced by trading volume?

4. Does investor sentiment dictate the level of momentum in Asia?

1.3 Research Objective

This study hopes to examine momentum strategy in Asian stock markets. Possible factors that could influence momentum profits are also investigated. Whilst there are four objectives listed below, the primary objective of this thesis is to examine the effect of sentiment, if any, on the level of momentum in Asian stock markets. The role of investor sentiment has yet to be evaluated in international markets. An investigation into this issue in Asia would provide crucial out-of-sample evidence. Thus, the crux of this thesis is to examine the relationship between sentiment and momentum. The objectives of this study are enumerated as follows:

1. To assess the existence of momentum in the Asian stock market.
2. To test whether firm size affects momentum profitability in Asia.
3. To evaluate whether trading volume influences the level of momentum in Asia.
4. To analyse whether investor sentiment affects momentum in Asia.

1.4 Significance of Study

The momentum effect has fascinated and garnered much attention for decades and continues to enthrall many a researcher. The reason for this preoccupation with momentum stems from the numerous and varied implications of the findings of these studies. Research on momentum not only has a theoretical contribution but also a practical one. Though momentum has been documented worldwide, the phenomenon is elusive in Asia. This study examines the presence of

momentum in Asia, and if momentum is found, it would strengthen the evidence on the existence of momentum.

This study also attempts to shed light on the possible drivers of the momentum effect. Risk based explanations have thus far been unable to explain momentum. Thus, this thesis takes on a primarily behavioral approach in the hope of shedding further light on the issue from an alternative perspective. The findings could assist in further understanding the momentum effect. In spite of the multitude of studies on momentum, the cause of momentum is still unknown. If momentum is found to be influenced by investor sentiment, it would provide support for behavioural theories of momentum such as Hong and Stein (1999). Moreover, it would lend credence to behavioural finance which bridges finance and psychology.

Investor sentiment is largely unexplored in relation to momentum, especially in Asia. To the best of my understanding, the first and thus far the only study specifically focusing on sentiment and momentum was conducted by Antoniou et al. (2013) on the US market. Not only does this thesis provide out-of-sample evidence, it also expands the study of sentiment to incorporate global investor sentiment and investor sentiment during the momentum portfolio holding period. Consumer confidence index is used to proxy investor sentiment, the data for which can be easily acquired. Investors can use this information to streamline existing momentum strategy. Resources can be concentrated on periods where momentum is more likely to occur, thereby increasing the returns to the momentum strategy. In short, insight is provided on improving the practical implementation of momentum strategy and

into the underlying cause of momentum through the investigation of investor sentiment.

Apart from investor sentiment, the investigation on firm size and trading volume is also of interest. Investigating the relationship between size and momentum helps to reveal whether momentum is isolated to a particular class of stocks. If momentum exists only in small stocks, then the returns could be from the well known size effect rather than any return continuation. Moreover, if momentum is predominantly present in small stocks, then exploiting the phenomenon could be difficult as small stocks are likely to be illiquid and have higher trading costs. In the case where a relationship is found between momentum and trading volume, modifications could be made to the trading strategy accordingly. If high volume stocks yield higher returns, then momentum portfolio returns could be improved by selectively trading in high volume securities. Thus, the findings of this study contribute not only towards establishing whether a momentum strategy would be viable in Asia but also for the practical implementation of the strategy.

Moreover, the study of momentum also contributes to the ever-piling literature against EMH. The efficient market hypothesis states that past data does not have any informational content and correspondingly has no relevance. There should be no possible way to continuously predict stock market returns and profit based on past data. Evidence of return predictability, as in the case of momentum investing, would imply that efficient market hypothesis is invalid. Evidence of momentum profitability runs contrary to even the weak form of EMH. As the efficient market hypothesis states that stock prices reflect all available information, it would be futile

for investors to attempt to generate profits from a trading strategy based on publicly available past data. In this respect if momentum is found in the Asian market, it would provide further evidence against the EMH.

Several other contributions are also made to literature. The studies of momentum on US and other developed markets are plentiful. Furthermore, the studies are in depth, focusing not only on the magnitude of momentum but also on the source of momentum. However, the studies on Asian markets are not as extensive. The markets covered in prior studies are repetitious, with the focus on selected countries such as Singapore and Hong Kong. Asian emerging markets are particularly neglected in momentum studies. This study incorporates developed as well as emerging Asian countries. The studies on investor sentiment have predominately focused on the US market. Perhaps this is to be expected as the investigation on sentiment is a relatively new but flourishing area of study. In spite of the increased attention paid to investor sentiment in recent years, the studies on international markets are limited and more so for Asian and emerging markets. Thus, the thesis works towards filling this critical gap by contributing to the much needed literature on investor sentiment in non-US markets.

As noted, the results of this study could be of importance to investors. The achievement of successful prediction of future returns based on past data is a profitable venture which could entice both novice and seasoned investors. Momentum is a simple strategy that could be easily implemented in practice. The momentum strategy requires only past stock price data. Past price data is publicly available and can be easily analysed using modern computing technology. The

strategy itself is uncomplicated as it is involves simply ranking the stocks based on past performance and trading only in the best and worst stocks. If this study finds significant momentum returns in Asia, then investors could hypothetically be able to profit by trading based on this finding. Moreover, this study also provides further insight on the momentum strategy with information such as the stocks to focus on (e.g. low or high volume stocks). As this study examines each of the Asian stock markets individually, a much more detailed and market specific information is provided to investors than an overall study (e.g. Brown, Du, Rhee & Zhang, 2008). Investors, especially in the US, have implemented trading strategies exploiting the momentum effect. Grinblatt, Titman, and Wermers (1995) found that US mutual fund managers are prone to follow a momentum based investment strategy. Kaminsky, Lyons and Schmukler (2004) also documented prevalent momentum investing by mutual funds in emerging markets. As such the interest in exploring momentum in Asia is not a purely academic pursuit but is of interest to investors worldwide.

1.5 Organization of Thesis

Chapter 1 describes the background of the study, research problem, the objectives of the study, research questions as well as the significance of the study. Discussion of prior studies related to the topic at hand is presented in Chapter 2. The hypotheses tested in this thesis are laid out sequentially in Chapter 3. Chapter 4 details the research methodology used in this study. The results are presented in Chapter 5 and the discussions of the results are continued in Chapter 6. Last but not least, Chapter 7 provides a recapitulation of the findings and states the shortcomings of the study. Suggestions for future research conclude the thesis.

CHAPTER TWO

LITERATURE REVIEW

2.0 Introduction

The ensuing sections provide coverage of past studies relevant to this thesis. Though it is impractical to cover all of the research in the field, best effort is put forth to discuss pertinent papers and ensure ample coverage of the subject matter. This review is divided into 8 sections (including subsections) covering the background on momentum, international evidence of momentum profitability, momentum in Asian markets, behavioural models of momentum, inability of risk in accounting for momentum, role of firm size, the link between trading volume and momentum, and finally investor sentiment. Following the review of literature, a brief summary ends this chapter.

2.1 Background of Momentum

Jegadeesh and Titman (1993) were the first to document the momentum effect in stock markets. The author examined momentum trading strategies over 3- to 12-month horizons for the period 1965 to 1989. They found that stocks which had initially performed well (poorly) over the previous months continue to perform well (poorly) in the following months. Hence, a portfolio with a long position in past winning stocks (winners) and short position in past losing stocks (losers) generated abnormal returns. To implement the momentum strategy, a series of overlapping portfolios were formed by buying winner stocks and selling losers stocks, which were defined based on past return. The momentum portfolios were formed based on cumulative returns over the past 3, 6, 9, and 12 months and held over similar periods;

the combination of formation and holding periods resulted in a total of 16 strategies. The highest return of 1.49% per month could be observed for momentum portfolio formed based on past 12 month returns and held for the following 3 months. Leaving a gap of 1 week before holding the portfolios in order to reduce biases increased the returns. The returns recorded in the medium term however 'dissipate in the following two years' (Jegadeesh & Titman, 1993, p. 89). The authors also noted that the returns could not be explained by systematic risk. In a follow up study, Jegadeesh and Titman (2001) concentrated on the 6-month holding period. In this article, the authors addressed the arguments that had been put forth against momentum. Among these, the accusations of data mining were tackled with out-of-sample tests. Momentum was still present for out of sample test period of 1990 to 1998 leading to the conclusion that the momentum effect recorded in the earlier study was not merely a product of data mining.

Since the dawn of this seminal work, there has been a plethora of work concentrating on momentum in the US. Researchers debated on the underlying cause of momentum with the arguments taking on a rational or behavioural perspective. Notably traditional risk models have largely been unable to fully account for the phenomenon. Fama and French (1996) reported that several common anomalies including long-term contrarian returns could be explained by the Fama and French three-factor model but momentum withstood the three-factor risk adjustment.

Given the shortcomings of asset pricing models in capturing momentum, several behavioral models emerged interpreting momentum as a product of cognitive biases of stock market investors. Some of the more prominent models were

constructed by Barberis et al. (1998), Daniel et al. (1998) and Hong and Stein (1999). Nonetheless, others contended that the failure of asset pricing models does not imply market inefficiency. Other non-behavioural factors may be able to explain momentum. Providing a rational explanation of the momentum effect, Conrad and Kaul (1998) argued that cross-sectional difference in expected returns is the primary cause of momentum. However, this argument was later rebuked by Grundy and Martin (2001). Jegadeesh and Titman (2002) also addressed this issue and found the explanatory power of cross-sectional differences in expected returns to be very limited. As demonstrated by the authors, Conrad and Kaul (1998)'s earlier findings arose due to a small sample bias that affected the empirical tests. Following the line of contradictory evidence, Bulkley and Nawosah (2009) examined this issue by stripping stock return of its unconditional expected returns (i.e. returns were demeaned). There was no momentum once stock returns were demeaned, which supported the notion that cross-sectional variation in expected returns is at the root of momentum returns. However the issue is far from resolved as Bhootra (2011) refuted the claim that momentum is absent in demeaned returns. The authors showed that the inclusion of penny stocks in the sample had distorted the results and this microstructure bias prompted Bulkley and Nawosah (2009) to arrive at the misleading conclusion. Once penny stocks were removed, profitable momentum was present for the demeaned returns.

Lewellen (2002) rejected the notion that underreaction propels momentum returns. Instead, the author claimed that momentum is driven by excess covariance. Bringing forth new evidence to the debate, Arena, Haggard and Yan (2008) found idiosyncratic volatility to be positively related to momentum. Stocks with high

idiosyncratic volatility had larger momentum and also greater reversals in the long term, this in turn implied that momentum occurs due to underreaction to firm-specific information. On the other hand, Chordia and Shivakumar (2002) demonstrated that a set of macroeconomic variables could explain a six-month/six-month momentum profit. Specifically, the macroeconomic variables used were dividend yield, default spread, the yield on three-month T-bills and the term structure spread. The authors interpreted this as evidence of momentum profits arising due to time varying risk. However Cooper et al. (2004) showed that the results do not survive adjustments to control for potential microstructure biases. The authors also claimed that momentum was dependent on the state of the stock market. Momentum was present only in up markets as momentum strategy surprisingly yielded negative returns following down markets. Distinguishing between the behavioural models, Asem and Tian (2010) presented empirical evidence specifically supporting the Daniel et al. (1998) model. Momentum was shown to be higher when market state persists in the same direction. The lack of momentum following down markets was attributed to the losses experienced when down market transitions to up market. Otherwise, if the down market continues on its downward trend, significant momentum could be observed.

Other than market states, dividends have also been linked to momentum. Asem (2009) showed that the changes in dividend policy have an impact on momentum returns as higher momentum is observed for stocks that pay a higher dividend. The author posited that the findings are consistent with behavioural models. Also taking on a behavioural perspective, Chui et al. (2010) found cross-country cultural differences to be the cause of the variation in the level of

momentum around the world. More specifically individualism, which is a measure of culture developed by Hofstede (2001), was shown to be positively related to momentum. Apart from empirical studies, Bloomfield, Tayler and Zhou (2009) interestingly undertook an experimental approach in evaluating Hong and Stein (1999) model. In a series of experiments with human traders and computerized trader, stock momentum was shown to indeed arise from overreaction as predicted by Hong and Stein (1999).

The vast majority of momentum literature tends to ignore transaction costs in the empirical analysis. Therefore, the momentum strategies may not entirely be profitable. As reported by Lesmond et al. (2004), momentum strategy is transaction cost intensive as it leans more towards high transaction cost stocks thus leading to an impression of profitability where none exists. While substantial momentum returns do exist, it is not sufficient to cover the high transaction costs. However Korajczyk and Sadka (2004) demonstrated, using a slew of transaction cost proxies for varying portfolio formation methods, that momentum is indeed robust even after considering transaction costs.

Despite the multitude of studies on the source of momentum, the puzzle remains to be untangled. However, the anomaly identified as momentum is persistent throughout time and has outlasted a battery of robustness tests. Over the years, modifications to the momentum strategy have been suggested with the intent of augmenting and strengthening the profits. Some researchers recommend combining momentum with other well known effects. The so-called style momentum was found to be profitable by Chen and De Bondt (2004). The strategy

was implemented by sorting stocks into ten portfolios based on market value, book-to-market ratio and dividend yield and buying (selling) portfolios with the best (worst) past returns. Interestingly the authors contended that style momentum exists separately from stock and industry momentum. Other studies maintain the general construct of the momentum strategy but offer adjustments for better performance. For example, Rachev, Jašić, Stoyanov and Fabozzi (2007) suggested the use of risk based selection of stock for the momentum portfolio and accordingly evaluated several measures including Sharpe ratio. This adjustment outperformed traditional stock selection on a risk-adjusted basis. Blitz et al. (2011) also suggested an amendment to the way stocks are selected. While stocks are normally ranked on past total return, the authors relied on standardized residual returns obtained from three-factor model (Fama & French, 1993) which resulted in approximately doubling of momentum profits.

2.1.1 International Evidence

The literature on non-US stock markets can be split into two categories, individual market studies focusing on only one country and international studies covering a large number of countries. Individual market studies delve deep into various aspects of momentum and on providing robustness. More often than not, international studies lack this depth, instead compensating with the larger sample of countries and hence offering a wider view momentum. This has its merits as it allows comparisons between markets, unearthing information that may otherwise be oblivious to researchers undertaking single market studies. Firstly, a review of the multi country international studies is presented followed by abridgement of single market studies.

One of the earliest non-US evidence was presented by Rouwenhorst (1998) in a study spanning 12 European countries: Austria, Belgium, Denmark, France, Germany, Italy, the Netherlands, Norway, Spain, Sweden, Switzerland and the United Kingdom. Diversified winner-loser portfolios that combined stocks from all countries produced significant returns for all holding periods. Concerned on the effects of country specific factors on the momentum profits that were observed, the author implemented a country neutral strategy. This entailed forming winner-loser portfolio in each individual country. Significant momentum was found in all countries with the exception of Sweden.

In a subsequent study, Rouwenhorst (1999) also found momentum in an investigation of 20 emerging stock markets. Of the 20 countries, 8 countries were Asian but only India had significant momentum with a return of 0.51% per month. Taking into consideration all of the individual emerging markets, six markets had significant returns for the winner minus loser portfolio. Although momentum is not present for all countries examined, a regional (all stocks are equally weighted) and country neutral approach (countries are assigned equal weights) produced significant returns of 1.74% and 1.86% respectively. Thus the author concluded that momentum in emerging markets is 'qualitatively similar' to developed markets. Momentum returns were computed using equally weighted monthly rebalanced portfolios formed based on the past 6 month returns and held for the following six months. However, the study did not account for market microstructure biases.

Chan, Hameed and Tong (2000) followed a different approach by using stock market indices of 23 countries rather than individual stocks. Moreover, weekly

returns were used to evaluate holding periods of 1, 2, 4, 12 and 26 weeks. The returns to momentum portfolios were positive and significant with the exception of the 12-week holding period. The returns were higher for shorter holding periods as illustrated by the 0.48% weekly return for the 2-week holding period compared to only 0.11% for 26-week holding periods. Profits disappeared after adjusting for world beta risk. The study also confirmed a positive relationship between trading volume and momentum. The momentum profits were robust to nonsynchronous trading, changes in beta for different market states and exclusion of emerging markets.

Griffin et al. (2003) undertook an extensive study spanning 39 countries. The countries were selected based on availability of data on Datastream International with the requirement that each country should have a minimum of 50 stocks. In addition to international stocks, US stocks were also examined. The study employed a 6-month formation and holding period with overlapping equally weighted portfolios. Momentum returns were found for a number of countries around the world. However, the authors noted that emerging markets have weaker returns than developed markets. Correlations of momentum returns within and across regions were low, indicating the lack of support for the possibility of global risk factors driving the momentum returns. Considering macroeconomic risks, the authors conducted unconditional (Chen, Roll, & Ross, 1986) and conditional tests (Chordia & Shivakumar, 2002) but neither model could successfully explain momentum in the international setting. In proceeding further, the authors attempted a model free examination by focusing on market states and returns. The authors argued that the existence of a positive relationship between market state and momentum would in

turn point towards macroeconomic risk a cause of momentum return. Again very little support is found with GDP growth, aggregate stock market movements and industrial production growth failing to account for momentum. The authors concluded that momentum returns are not driven by macroeconomic risk. Finally, a long-term reversal was also found which is in line with the predictions of behavioural theories.

Similar to Chan et al. (2000), Fong, Wong and Lean (2005) also investigated momentum using international stock indices. However, the authors used daily stock returns, which could be affected by issues of non-synchronous trading. Returns for the momentum strategy were found to be significant for three (1 month, 3 months and 9 months) of the five holding periods. Stochastic dominance tests revealed that winners dominate losers at the second and third order but there was no such evidence at the first order. The authors concluded that a rational explanation for momentum is unlikely.

Naranjo and Porter (2007) concentrated solely on 11-month ranking period and 1-month holding period strategy for 40 countries. Although 39 markets displayed positive returns for the momentum strategy, only 11 markets had statistically significant returns. Segregating the sample based on market development showed that emerging markets had a higher momentum profit of 0.79% compared to 0.56% for developed markets. Risk adjustments using three variations of the market model showed that the models could not explain the momentum returns. Moreover, the results indicated that momentum was correlated across national markets and the comovement could be explained by the market

models. The authors also highlighted the advantages of adding emerging markets to the international momentum portfolio including risk reduction of approximately 40%.

Gupta, Locke and Scrimgeour (2010) undertook another large-scale study, which covered 43 countries from 1973 to 2007. More specifically the study examined the effects of portfolio structure on momentum returns. Momentum was found to persist globally for varying portfolio construction methods including the use of US/local currency and equal/value weighting. The authors noted that some of the portfolio methods yielded superior returns than others. Among the methods considered, value weighted portfolios was found to have greater returns than equal weighted portfolios. Failing to leave a one-month gap between holding and formation period reduced returns to the momentum portfolio. Moreover, momentum returns increased as number of portfolios was increased.

In a recent study, Chui et al. (2010) utilized Hofstede (2001) cultural measure in relation to momentum. The main purpose of the study was to examine the role of individualism in the cross-country variation of momentum. Individualism was found to be positively related to momentum through a sorting procedure and also a Fama and MacBeth (1973) regression. The other dimensions of culture (power distance, masculinity and uncertainty avoidance) were also briefly examined for robustness but were found to be insignificant. Chui et al. (2010) also undertook cross-country regression on several variables suggested by behavioural models as well as variables related to market development and institutional quality as control variables. As a part of their study, Liu, Liu and Ma (2010) also ran a regression to