THREE ESSAYS ON CONTRARIAN RETURNS IN ASIAN EMERGINGMARKETS

ALI FAYYAZ MUNIR

FACULTY OF BUSINESS AND ECONOMICS
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ABSTRACT

This study evaluates the contrarian effect in time-varying circumstances of emerging Asian economies. The study is divided into three objectives: (i) To examine the relationship between varying stock market conditions and contrarian returns with reference to the dynamic market assumption of Adaptive Market Hypothesis (AMH); (ii) To examine the impact of firm-specific, industry-specific and macroeconomic factors on contrarian strategy's profitability; and (iii) To examine the impact of varying degrees of financial liberalization on contrarian strategy payoffs. Accordingly, each research objective is represented by a separate essay.

The first essay dealing with objective 1 investigates the relation between time-varying stock market conditions and contrarian returns in South Asian stock markets based on the dynamic market assumption of the Adaptive Market Hypothesis (AMH). Not only the existence of significant contrarian returns is confirmed in all the sample emerging markets, but the study also finds that these returns are time-varying, where the excess return opportunities wax and wane over time based on contrarian portfolios. Further investigations indicate that contrarian returns strengthen during the negative market states, higher volatility and crises periods, particularly during the Asian financial crisis. Interestingly, the market state is found to be the primary predictor of contrarian payoffs instead of market volatility, which contradicts the findings of developed markets.

The second essay addressing objective 2 examines the predictive ability of firm-specific, industry-specific and macroeconomic factors over contrarian strategy payoffs. By employing portfolio formation and subsequent rebalancing methodology, this study finds that firm-specific factors such as trading volume and market value have significant predictive power towards contrarian returns. Stocks with lowest trading volume group

generate highest contrarian returns. This finding supports the conjecture that trading volume proxying information asymmetry can be a determining factor for contrarian profitability in South Asian stock markets. Regarding industry analysis, the empirical findings provide evidence for short-term industry contrarian effect. Using data spanning different market states, the study finds that industry contrarian effect was stronger during the Asian and global financial crisis, while industry momentum effect was evident after the global financial crisis and during COVID epidemic. The overall findings of this section imply that Industry aspect cannot be neglected while interpreting the returns of trading strategies in emerging markets. Next, the findings based on predictive regressions suggest that three-month treasury rate, balance of trade and world market return (MSCI) have significant predictive power for contrarian profitability in South Asian stock markets.

Finally, the third essay representing objective 3 investigates the behavior of contrarian strategy payoffs under varying degrees of financial liberalization in Asia-Pacific emerging markets, namely China, India, Indonesia, Korea, Malaysia, Pakistan, Philippines and Thailand. These markets represent economies that display a gradual change in the degree of financial liberalization instead of fully opening their markets to foreign investors at once. By using the dataset of all listed firms and four different measures of the degree of financial liberalization, the study employs portfolio formation, panel regressions and binary modelling methods to reveal the impact of partial and complete financial liberalization on contrarian returns. This study documents a negative relationship between the degree of financial liberalization and contrarian strategy payoffs. The results further indicate that small-sized emerging markets reveal more significant and higher contrarian returns as compared to their larger counterparts. The study findings are consistent with the investor-base broadening hypothesis, where the small and less liberalized emerging markets offer opportunities for investors and

fund managers to produce abnormal contrarian returns that cannot be earned by other conventional investment strategies.

Keywords: Adaptive Market Hypothesis; Contrarian Effect; Stock, Industry, and Macroeconomic factors; Financial Liberalization; Asian Emerging Markets

ABSTRAK

Kajian ini menilai kesan kontrarian pada ekonomi-ekonomi membangun di Asia dalam keadaan waktu berbeza dari tahun 1997 hingga 2018. Kajian ini dibahagikan kepada tiga objektif: (i) Untuk mengkaji hubungan antara keadaan pasaran saham yang berbeza dan pulangan kontrarian dengan merujuk kepada andaian pasaran dinamik *Adaptive Market Hypothesis (AMH)*; (ii) Untuk mengkaji kesan faktor khusus firma, faktor khusus industri dan makroekonomi terhadap keuntungan strategi kontrarian; dan (iii) Untuk mengkaji kesan pelbagai tahap liberalisasi kewangan terhadap pulangan strategi kontrarian. Oleh itu, setiap objektif kajian ini diwakili dengan esei yang berasingan.

Esei pertama berkaitan dengan Objektif 1 menyiasat hubungan di antara keadaan pasaran saham yang berbeza waktu dan pulangan kontrarian di pasaran saham Asia Selatan berdasarkan andaian pasaran dinamik *Adaptive Market Hypothesis (AMH)*. Bukan sahaja pulangan kontrarian yang signifikan disahkan di semua sampel pasaran ekonomi membangun, kajian ini turut mendapati pulangan tersebut berlaku dalam waktu yang berbeza, di mana peluang membuat lebihan pulangan pada portfolio kontrarian naik dan turun dari masa ke masa. Siasatan lanjut mendapati bahawa pulangan kontrarian bertambah semasa pasaran negatif, keadaan volalitiliti yang tinggi dan juga ketika tempoh krisis ekonomi terutamanya semasa krisis kewangan Asia. Menariknya, keadaan pasaran didapati sebagai peramal utama kepada pulangan kontrarian dan bukannya volatiliti pasaran, ini bertentangan dengan penemuan di pasaran-pasaran maju.

Esei kedua yang menyentuh Objektif 2 pula mengkaji keupayaan ramalan terhadap keuntungan dalam strategi kontrarian bagi faktor khusus firma, faktor khusus industri dan makroekonomi. Dengan menggunakan metodologi pembentukan portfolio dan

pengimbangan semula, kajian ini mendapati bahawa faktor khusus firma seperti volum dagangan dan nilai pasaran mempunyai kuasa ramalan yang signifikan terhadap pulangan kontrarian. Saham dengan kumpulan volum dagangan terendah menjana pulangan kontrarian tertinggi. Dapatan ini menyokong andaian bahawa asimetri maklumat proksi volum dagangan boleh menjadi faktor penentu untuk keuntungan kontrarian dalam pasaran saham Asia Selatan. Mengenai analisis industri pula, penemuan empirikal memberikan bukti kesan jangka pendek kontrarian industri. Dengan menggunakan data yang merangkumi keadaan pasaran yang berbeza, kajian mendapati bahawa kesan kontrarian industri adalah lebih kuat semasa krisis kewangan Asia dan global, manakala kesan momentum industri terbukti selepas krisis kewangan global dan semasa wabak COVID. Penemuan keseluruhan bahagian ini membayangkan bahawa aspek industri tidak boleh diabaikan semasa mentafsirkan pulangan strategi perdagangan dalam pasaran membangun. SeterusnyaAkhir sekali, penemuan berdasarkan regresi ramalan mencadangkan bahawa kadar perbendaharaan tiga bulan, imbangan perdagangan dan pulangan pasaran dunia (MSCI) mempunyai kuasa ramalan yang signifikan untuk keuntungan kontrarian dalam pasaran saham Asia Selatan.

Akhir sekali, esei ketiga yang mewakili Objektif 3 cuba mengenalpasti tingkah laku pulangan strategi kontrarian di bawah pelbagai tahap liberalisasi kewangan dalam konteks pasaran-pasaran membangun di Asia-Pasifik iaitu China, India, Indonesia, Korea, Malaysia, Pakistan, Filipina dan Thailand. Pasaran ini mewakili ekonomi yang memperlihatkan perubahan secara bertahap dalam liberalisasi kewangan dan tidak membuka pasaran mereka sepenuhnya kepada pelabur asing secara sekaligus. Dengan set data harian syarikat-syarikat tersenarai dan empat ukuran tahap liberalisasi kewangan yang berbeza, kajian ini menggunakan teknik formasi portfolio, regresi panel dan kaedah pemodelan binari untuk mendedahkan kesan liberalisasi kewangan separa dan lengkap terhadap pulangan kontrarian. Hasil kajian selanjutnya menunjukkan

bahawa pulangan kontrarian adalah lebih tinggi dan signifikan di pasaran membangun bersaiz kecil berbanding dengan pasaran membangun lain yang lebih besar. Penemuan kajian ini selaras dengan hipotesis pelebaran berasaskan pelabur (*investor-base broadening*), di mana pasaran membangun yang kecil dan kurang liberal menawarkan peluang kepada pelabur dan pengurus dana untuk menghasilkan pulangan kontrarian yang luar biasa serta tidak dapat diperoleh dari strategi pelaburan konvensional yang lain.

Kata kunci: Hipotesis Pasaran Adaptif; Kesan Kontrarian; Faktor-Faktor Stok, Industri dan Makroekonomi; Liberalisasi Kewangan; Pasaran Membangun Asia

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LIST OF SYMBOLS AND ABBREVIATIONS

EMH	Efficient Market Hypothesis
AMH	Adaptive Market Hypothesis
LMW	Losers minus Winners
CAR	Cumulative Average Returns
DHS	Daniel, Hirshleifer & Subrahmanyam Hypothesis
CAPM	Capital Asset Pricing Model
FFTM	Fama-French Three Factor Model
PSX	Pakistan Stock Exchange
BSE	Bombay Stock Exchange
DSE	Dhaka Stock Exchange
ETFs	Electronic Traded Funds
SSE	Shanghai Stock Exchange
IDX	Indonesia Stock Exchange
KRX	Korea Stock Exchange
PSE	Philippines Stock Exchange
SET	Stock Exchange of Thailand
SZSE	Shenzhen Stock Exchange
TRBC	Thomson Reuters Business Classification
ICB	Industry Classification Benchmark
GICS	Global Industry Classification Standard
FTSE	The Financial Times Stock Exchange
3M-INT	Three-month Treasury Rates
EXC	Exchange Rate
CPI	Consumer Price Index
IPI	Industrial Production Index

BOT	Balance of Trade
MSCI	Morgan Stanley Capital International
VIX	The Chicago Board Options Exchange Volatility Index
+VOL	Positive Market Volatility State based on Market Returns
-VOL	Negative Market Volatility State based on Market Returns
LMF	Lane and Milesi-Ferretti Liberalization Measure
FEL	Foreign Equity Liabilities
EW	Edison and Warnock Liberalization Measure
CI	Chinn and Ito Liberalization Measure
HF	Heritage Foundation Liberalization Measure
EFW Measure)	Economic Freedom of the World (Fraser Institute's Liberalization
IMF	International Monetary Fund
AREAER	Annual Report on Exchange Arrangements and Exchange Restrictions
FDIs	Foreign Direct Investments
GDP	Gross Domestic Product
CSE	Chittagong Stock Exchange
RBI	Reserve Bank of India
SECP	Securities and Exchange Commission of Pakistan
AMEX	American Stock Exchange
KSE	Karachi Stock Exchange
NYSE	New York Stock Exchange
CRSP	Center for Research in Security Prices
NASDAQ Exchange	National Association of Securities Dealers Automated Quotations
ADRs	American Depository Receipts
OECD	Organization for Economic Co-operation and Development

S & P	Standard and Poor
IFCI	International Finance Corporation Index
GLS	Generalized Least Square
BPLM	Breusch-Pagan Lagrange Multiplier Test
REITs	Real Estate Investment Trusts

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CHAPTER 1: INTRODUCTION

1.1 Overview of Chapter

The overall thesis consists of three research objectives (essays) related to a common theme, i.e., the implications/application of contrarian investment strategy in various stock market circumstances of emerging Asian economies. This chapter provides the research foundation by discussing the problem statement, relevant issues, research objectives and research questions. Section 1.2 reports an introduction of the contrarian investment strategy; Section 1.3 discusses its relevance to the Adaptive Market Hypothesis (AMH) and emerging market economies. Section 1.4 discusses the problem statement; Section 1.5 elaborates the research objectives while Section 1.6 presents research questions; Section 1.7 provides the contribution of the overall research; and finally, Section 1.8 presents the organization of the thesis.

1.2 Contrarian Investment Strategy and Stock Market Reversals

The two stock market anomalies, which are often deemed hard to interpret through the Efficient Market Hypothesis (EMH) thoroughly, are momentum and contrarian investment strategies. Momentum investing is a strategy that capitalizes on the continuance of the current market trend. It suggests taking a long position in stocks, market ETFs or futures, showing an upward pricing trend and shortening the assets with a downward pricing trend. Contrary to the momentum strategy, a reversal or contrarian strategy involves bucking against the current market trend to make profits. A stock market reversal refers to the turning of a price trend, characterized by a definitive high, low or a successive directional move against the fixed price action. A reversal involves the falling of stock prices from an absolute high position established by an upward trend in a bullish market regime. Reversals in financial markets are a fact of life. Prices

usually reverse at some point and show multiple ups and downs over time. Ignoring reversals can lead to a greater risk than expected.

In the literature of finance and economics, a contrarian investor is defined as an investor who attempts to gain profit by investing in a manner opposite to conventional wisdom as he perceives the consensus view as wrong. A contrarian strategy suggests a long position in prior loser stocks and a short position in prior winner stocks. The phenomenon behind this particular investment strategy is "market overreaction." According to the market overreaction phenomenon, stock prices tend to follow their fundamental values by demonstrating a mean reversal of stock returns; consequently, the past's bad performing stocks tend to do well in the future and vice versa. Thus, the approach emphasizes selling the past winners and investing in past losers. When adopting this strategy, the investor believes that specific crowd behavior among investors can cause mispricing in stock markets, creating exploitable return opportunities. For example, the widespread pessimism about a loser stock can drive its price too low, which overstates its risks and understates the prospects for returning to profitability. The strategy of buying these distressed stocks at low prices and selling them when these stocks recover can lead to significant returns in the future. On the contrary, a widespread optimism about the winning stocks can lead to overvaluation of those stocks that will eventually lead to drops when high expectations don't pan out. Avoiding investment in such over-hyped stocks can reduce the chances of future losses. These common principles lead to follow the contrarian investment strategy in emerging stock markets.

DeBondt and Thaler (1985, 1987) primarily tested the phenomenon for an extended period. They provide evidence supporting contrarian returns that the stock prices overreact and move towards their intrinsic values, while substantial returns are earned

through contrarian investment strategies over 3 to 5 years. They prove that the loser portfolios beat the winner portfolios by making approximately 25% higher returns. So, the contrarian effect holds, and the market becomes inefficient in its weak form in the longer horizon. The reversal effect is more common in individual securities, as identified by Jegadeesh (1990) and Lehmann (1990), where stocks with positive returns in the past show poor performance later on. Many researchers have offered alternative explanations of contrarian returns as per their intuitions based on the different phenomenon and varying market conditions (Yalçın, 2008; Asness, 2011; Ramiah et al., 2016; Chan & Lu, 2017; Yu et al., 2019).

1.3 Adaptive Market Hypothesis and Trading Strategies

The Efficient Market Hypothesis (EMH) suggested by Fama (1970) states that the stock prices reflect all the available information; hence any historical or publicly available information cannot form grounds for anyone to earn abnormal returns. Investors make an average profit when the stock markets are efficient. The EMH is a significant theory in the domain of financial economics but subjects to debate due to its profound implications. Some researchers and economists still believe that stock prices are predictable to some extent, and investors can earn abnormal returns due to market overreaction or underreaction (DeBondt & Thaler, 1985, 1987; Jegadeesh & Titman, 1995). One of the most debated issues of the EMH is predictable patterns of contrarian and momentum investment strategies, which are often considered hard to interpret through market fundamentals.

After identifying momentum and contrarian strategy, the proponents of EMH tried to link the abnormal profits of these anomalies with time-varying risk factors and attempted to explain it through multi-factor asset pricing models (Carhart, 1997; Fama & French, 1993, 2017). However, no such description can be given for momentum and

contrarian anomalies; and as per the proponents of EMH, the multi-factor model cannot fully explain these anomalies (Fama & French, 2012). On the other hand, the behavioral side believes that the investors' overreaction to market information is the prime cause of contrarian profits (DeBondt & Thaler, 1985; Jegadeesh & Titman, 1995), although it is still ambiguous why investors show overreaction to information. Hence, the literature is widely inconclusive because of the varying explanations offered by different researchers about contrarian and momentum returns based on different circumstances and stock markets.

From the past few years, the EMH has been criticized for struggling to justify the returns of stock market anomalies (e.g., contrarian and momentum effects). In most recent times, the researchers are looking to test the stock market efficiency across markets and over time, rather than seeing market efficiency as an all or none phenomenon. In this context, Lo (2004) proposed the latest theory of market efficiency named the adaptive market hypothesis (AMH), which states that market efficiency is time-dependent and varies across markets. Momentum and contrarian are the stock market anomalies that always represent the departures from the stock market efficiency. This deviation from stock market efficiency and the extension in changed behavior of market anomalies due to change in the macro-environment may provide justifications for the existence of such anomalies.

The current literature provides extensive evidence supporting the AMH, main studies focus on measuring the time-varying probability of stock returns as a market efficiency measure (Kim et al., 2011; Ito et al., 2016; Shi et al., 2017). Another line of literature is concentrating on evaluating the time-dependent efficiency of trading anomalies implied in AMH. The previous studies have also highlighted the importance of changing market conditions in understanding the momentum effects. Cooper et al. (2004), for example,

study the profitability of momentum investment strategy in both "up" and down" market states and find that momentum strategy profits mostly prevail in the "up" market state in the U.S equity market. Urquhart and McGroarty (2014) further suggest that seasonal shifts support AMH's prominence on the U.S. stock exchange.

The literature on the momentum investment strategy is widespread. Instead of focusing on the well-explored momentum strategy, this research evaluates the contrarian investment strategy in different periods of Asian stock markets to find some AMH-consistent implications for the contrarian effect. In this regard, the research primarily evaluates the contrarian effect in South Asian emerging equity markets under varying market states (positive, negative, high volatility, low volatility, stock market bubbles and crashes) in order to prove the dynamic market assumption of the AMH. Afterwards, the research investigates the predictive ability of firm-specific, industry-specific and macroeconomic factors toward contrarian profitability by keeping in mind the AMH-consistent explanation that all these factors may also influence the internal and external environment of selected stock markets. Finally, the research examines the behavior of contrarian strategy payoffs in different phases of stock market liberalization in major Asian emerging markets to devise some policy recommendations for investors and policymakers.

1.4 Problem Statement

Several studies have been conducted on market efficiency; many considered the EMH perspective and investigated whether the markets follow a random walk over the more extended sampling periods. The issue with this technique is that market efficiency can be easily judged as an all-or-none condition (Champbell et al., 1997). Another perspective presented by Lo (2004) as well as Lim and Brooks (2011) suggests that, in compliance with the AMH, market efficiency is dynamic in nature which varies over

time based on the different stock market circumstances. Moreover, it is difficult to measure the EMH because there is no agreement about various forms of market efficiencies that need to be tested (Titan, 2015). The dynamic market assumption of AMH focuses on the notion that the level of market efficiency varies over time based on market conditions, market competition level, market participants, and the adaptability of those participants. For example, Noda (2016) tests how the level of market efficiency varies over time in two major stock indices of Japan. Urquhart and McGroarty (2016) investigate the AMH on four developed stock markets by examining how the degree of return predictability associates with the varying market conditions and conclude that there are statistically significant predictable patterns in some periods, while other periods do not show any significant predictability. Moreover, the return predictability exhibits a statistically significant association with varying stock market conditions.

The applicability of AMH on the dynamic nature of South Asian emerging stock markets requires further investigation, specifically within the framework of contrarian effect. In these emerging markets, the mean-reversion of stock prices, non-randomness of returns, and information asymmetry among investors are common issues (Chui et al., 2010; M. Liu et al., 2011; Akhter & Yong, 2019). The information environment is less transparent at both firm- and market-level, while a major proportion of investors consists of irrational retail investors. All the above characteristics make the sample stock markets more volatile, which may create frequent opportunities of abnormal returns for contrarian investment strategies. Moreover, greater information asymmetry between various groups of investors may also generate possibilities for short-term momentum and eventual reversals for investors. Skepticism generates both momentum and contrarian profits. When investors grow distrustful of other people's signal quality and presume that individuals who were among the first to obtain knowledge have learnt relatively little, underreaction occurs, resulting in a momentum impact in the near run.

Reversals are more likely to occur if investors react quickly to stale information, generating an unwarranted spike in stock prices owing to overreaction (Lee & Swaminathan, 2000).

The existing literature mostly documents the success of momentum investment strategies in relatively more developed markets (Grundy & Martin, 2001; Hart et al., 2003; Fama & French, 2008, 2012; Asness et al., 2013; Wang & Xu, 2015), while the outperformance of contrarian investment strategies is evident in emerging markets, mainly in Asian stock markets (Hameed & Ting, 2000; Griffin et al., 2003; Locke & Gupta, 2009; Shah & Shah, 2017; Chowdhury et al., 2018; Yu et al., 2019). By using daily stock price data, Loke and Gupta (2009) report short-term contrarian profits in Bombay stock exchange and considered size as a determining factor. Similarly, Shah and Shah (2017) provide evidence of short-term momentum and long-term reversals effects by using the weekly data of stocks listed in Pakistan stock market. The further reveal that underreaction and cross-sectional risk are the main contributing factors for momentum profitability. By utilizing weekly data from 2002 to 2013, Chaudhary et al. (2013) investigated the presence and sources of momentum and contrarian profits in Bangladeshi stock market. Their findings reveal contrarian profits in the initial period of sample, while idiosyncratic factors were found to be the main sources of contrarian profits.

All the above highlighted studies in this region considered the EMH perspective rather than AMH while interpreting the returns of stock market anomalies. Moreover, these studies are rare that take into account the influence of AMH-recommended elements including market conditions and other factors relating to the internal and external environment of a stock market (such as firm, industry, and macroeconomic factors). Therefore, the first two objectives of the thesis examine the impact of various

market conditions and different internal and external factors on contrarian strategy's profitability. More explanation on the selection and relevance of selected essays is provided in the motivation section of the thesis.

Over the past few years, the Asian emerging markets have undergone several regulatory changes. During the early years, there were more restrictions on foreign investors' participation in local equity markets in some Asian countries. From the late 1980s onward, foreign equity participation significantly improved in these markets (see, e.g., Bekaert & Harvey, 1997; Bekaert & Harvey, 2000). However, the degree of financial liberalization has varied substantially across countries over the study period of current research. Therefore, this thesis expects that changing stock market liberalization states may also impact the profitability of contrarian strategy, although the effect is previously unknown. In the final phase, this thesis attempts to analyze the behavior of contrarian returns during the time-varying change in the degree of financial liberalization. To achieve this objective, the study requires the sub-samples of least and most liberalized countries. Therefore, the study enhances the sample countries in order to make the sub-samples rational and more representative. The sample countries express similar characteristic in a way that all countries exhibit a gradual change in the degree of financial liberalization instead of fully opening their markets to foreign investors at once. This section also helps the researcher to devise some policy recommendations for investors and policymakers regarding the returns to stock market anomalies and subsequent efficiency of stock markets.

1.5 Research Objectives

Based on the discussion in Sections 1.4 and 1.5, this research aims to evaluate the appropriateness of contrarian investment strategy in various stock market circumstances of Asian emerging stock markets. As per the findings of existing literature and the

author's discussion in Section 1.4 regarding the failure of momentum and success of contrarian investment strategy in Asian stock markets, it is pertinent to evaluate the contrarian effect in various stock market conditions such as positive, negative, high volatility, low volatility, crises periods, changing internal and external environmental factors, and the varying states of stock market liberalization. For the purpose of analysis, the main objective of this research has been divided into three sub-objectives, which are represented by three essays (research papers). Accordingly, a separate chapter is assigned to each essay (objective) that further includes the relevant sections on introduction, literature review, methodology, results, discussion, and conclusion. As a part of an introduction to this research, the following section is dedicated to the discussion of the objectives in greater detail.

1.5.1 First Objective of the Research

The first objective of this research is to examine whether the profitability and significance level of contrarian investment strategy varies in different conditions of stock markets, as suggested by the Adaptive Market Hypothesis (AMH). This hypothesis states that the explanation for stock market anomalies, like contrarian strategy, varies across markets and the level of significance of anomalous profits from such investment strategies also differs over time (Lo, 2004; Asness et al., 2015). Several studies have presented different risk-based (e.g., Jegadeesh & Titman, 1993; Avramov & Chordia, 2006) as well as behavioral (Nofsinger & Sias, 1999; Hong et al., 2000) interpretations over the past few decades as to why the anomalous trading patterns exist in stock returns. However, it is still inconclusive that how past performance of stocks influence further performance and consequently the returns of trading strategies.

Based on the AMH assertion about the dependency of profitability and significance of market anomalies on changing market conditions, the study urges that it is essential

to examine the AMH on the emerging stock markets of South Asia. The recent literature explored the time-dependent predictability of investment strategies implied in the AMH. The studies look at whether the changes in risk-adjusted profits of trading strategies vary over time. The prior analyses conducted by utilizing the data of foreign exchange market (Neely et al., 2009; Neely & Weller, 2013), and stock market indexes of the US and other developed equity markets (Todea et al., 2009; Patari & Vilska, 2014; Taylor, 2014; Anghel, 2015). However, relatively fewer studies focused on the profitability of momentum and contrarian investment strategies within the context of AMH in the Asian emerging markets (Shi & Zhou, 2017; Akhter & Yong, 2019). For example, using the AMH framework, Akhter and Yong (2019) study the development of momentum strategy returns over time. But the study mainly focused on momentum strategy's profitability and formed portfolios based on relative strength strategy. This thesis forms equally weighted contrarian style portfolios based on different AMH-suggested market circumstances and examines the time-dependent predictability of contrarian strategy payoffs.

1.5.2 Second Objective of the Research

The second objective of this research investigates the predictive power of some firm-specific, industry-specific, and macroeconomic characteristics over contrarian strategy's profitability. While conventional price momentum and contrarian effects are well-established features of stock markets, style-based investment strategies may be viewed as fresh empirical evidence challenging the notion of efficient capital markets. According to Barberis and Shleifer (2003), investors classify equities into distinct styles based on stock-specific features. They claim that distinguishing between styles is especially appealing to institutional investors since it allows them to arrange and streamline portfolio allocation choices, as well as evaluate professional managers'

performance compared to defined style benchmarks. They further state that the popularity of styles varies over time due the deviation of asset prices from their intrinsic values. The classification of stocks into different styles has major implications for stock prices. Fundamentally dissimilar groups of stocks may move in opposite direction depending on the specific stock market environment. Consistent with the Adaptive Market Hypothesis (Lo, 2004, 2005), it is also evident in the recent research that the performance of investment strategies may vary over time owing to path-dependent and time-varying risk factors (Shi & Zhou, 2017). This suggests that traders must adjust to changing market circumstances in order to improve their performance. Therefore, the current objective attempts to evaluate the performance of style-based contrarian strategies by classifying the stocks into different firm-specific and industry-specific groups.

There is mixed evidence regarding momentum and contrarian effect in emerging markets (May et al., 2014; Demirer et al., 2015; Shi et al., 2015; Yu et al., 2019). May et al. (2014) find that momentum strategies show marginal but statistically significant momentum profits in Malaysian stock markets. (Demirer et al., 2015) confirm the presence of short-term momentum effect in the Chinese equity market, and they associate these findings with significant herding effect. However, in contrary with above evidence, Shi et al. (2015) and Yu et al. (2019) find long-term and short-term contrarian effect in the same market. While the contradictory evidence of momentum in emerging markets may be attributed to retail investors and other stock and industry-specific characteristics, the importance of macroeconomic and global factors cannot be neglected. The significance of macroeconomic and global risk factors in sample emerging markets is explained below in the motivation section of the thesis.

1.5.3 Third Objective of the Research

The third objective of this research is to investigate the behavior of contrarian strategy payoffs under varying degrees of financial market liberalization. In recent empirical literature, the role of macroeconomic factors has gained a great deal of attention in predicting the profitability of contrarian investment strategy. For instance, Gregory et al. (2003) claim that contrarian profits exist in the UK even after controlling for consumption, investment and GDP growth level. In a similar vein, Parikakis and Syriopoulos (2008) reveal that the contrarian strategy earns superior returns in foreign exchange markets. More recent literature also highlights the significance of macroeconomic factors in understanding contrarian anomaly behavior. As per Shi and Zhou (2017), the lower macroeconomic uncertainty is linked with higher contrarian investment profitability. In addition, Ikizlerli et al. (2019) suggest that unemployment and GDP growth rates are important determinants of contrarian strategy payoffs.

The current thesis hypothesizes that financial market liberalization may also affect the profitability of investment strategies (Hart et al., 2003; Groot et al., 2012). Despite the importance of rapidly evolving integration process, the possible impact of this macroeconomic factor on contrarian strategy payoffs has been ignored in the literature. A significant number of empirical studies concentrate only on the relationship between financial liberalization and stock returns, volatility and cost of capital (Bekaert & Harvey, 2000; Bae et al., 2004; Chari & Henry, 2004; Stiglitz, 2004; Bekaert et al., 2005; Moshirian, 2007). This thesis extends this line of literature by investigating the relationship between the time-varying nature of financial market liberalization and contrarian payoffs in the emerging market context.

By utilizing the daily dataset sample from eight Asia-Pacific emerging markets such as China, India, Indonesia, Korea, Malaysia, Pakistan, Philippines and Thailand, this

study attempts to investigate whether small and less liberalized financial markets provide opportunities for investors and portfolio managers to generate abnormal contrarian returns that cannot be earned through other conventional investment strategies. The possible explanation for this relationship could be borrowed from investor-base broadening hypothesis, which states that the lower degree of financial market liberalization leads to less openness and lower efficiency of stock prices, thereby increasing the chances of excess returns for various investment strategies (Merton, 1987; Kwan & Reyes, 1997; Wang, 2007).

1.6 Research Questions

In line with the research objectives discussed in the previous section, this research designs the following research questions:

1. Do the changing market conditions impact the contrarian strategy payoffs in South Asian emerging equity markets?
2. Do firm-specific, industry-specific and macroeconomic factors show predictability over contrarian profitability in South Asian emerging equity markets?
3. Does financial market liberalization have an impact on contrarian strategy payoffs in emerging Asian economies?

The research objectives that have been thoroughly discussed in the previous section will comprehensively address all the research questions raised in this section.

1.7 Motivation of the Thesis

Prior studies test market efficiency as an all or none phenomenon meaning that the implication for EMH will remain the same for every market as the investors are rational everywhere. However, consistent with the notion of AMH, this thesis focused on the

assumption of relative market efficiency and examined the market efficiency of selected South Asian markets in varying market circumstances. As suggested by the AMH (Lo, 2004), the behavior of equity market anomalies may change over time across markets. Investor personality traits and factors relating to specific stock market environment (such as firm-specific, industry-specific, macroeconomic, and global risk factors) may play an important role in explaining the time-varying behavior of market efficiency in the shape of higher stock or anomaly returns in emerging markets. Based on the above justifications, the first two essays of the thesis examine the impact of various market conditions and the role of firm-specific factors, industry-classification as well as macro and global risk factors on contrarian strategy's profitability.

Compared to prior studies on liquidity and investment strategy returns documenting conventional positive nexus between liquidity and momentum anomaly returns, essay 2 of the thesis considers the liquidity as a proxy of information asymmetry and examines the negative relationship between liquidity and contrarian strategy's profitability. This essay applies trading volume as a proxy for liquidity because trading volume is also considered a useful indicator of information of stocks (Lee & Swaminathan, 2000). Investors' misperceptions about a company's future profits potential are linked to information content. As a result, the more uncertain the firm's valuation environment is, the higher disagreement among investors about the intrinsic value of stocks, hence the larger the volume or turnover. Consequently, highly traded stocks will experience severe mispricing, which may lead to a very short-term momentum but the ultimate contrarian effect following the market correction of overpriced and underpriced stocks. Therefore, this study expects that stocks having lower trading volume will yield higher contrarian profits because they face lower information asymmetry problem. In continuation with prior AMH-consistent analysis, Essay 2 also examines the nexus between industry classification and contrarian profitability under varying market states.

As an alternate scheme, the study also evaluates the performance of industry-neutral contrarian portfolios. The study identifies the top three common industries that contain the highest number of equities in every stock market. Portfolios are formed within each industry pool in order to examine whether contrarian effect holds when industry impact is controlled for. In the final section of the essay, the essay highlights the influence of macro and global risk factors on contrarian profitability. While most prior research focused at examining the influence of various macroeconomic factors on basic stock returns or volatility, the current study examines the predictability of macroeconomic and global factors over contrarian profitability in South Asian stock markets.

It is worth noting that the selected set of South Asian emerging markets has demonstrated contrarian effect which is contradictory to momentum in developed markets. These economies experienced a remarkable average GDP growth of 5.48% and more than 100% rise in FDI during the past 20 years. Moreover, foreign equity investment inflows in three sample markets raised to 198 billion USD, which accounts for almost 100% of foreign equity investments in South Asia and around 20% of foreign equity investments in middle- and low-income economies. Following the formation of South Asian Federation of Exchanges (SAFE) in 2000, the selected stock markets of South Asian economies embraced harmonization policies and permitted international investors to acquire stocks of locally listed firms. The current investigation looks at whether this time of outstanding economic success in the three sample economies may explain changes in stock market anomaly returns, or if regional and global dynamics play a role in understanding the contrarian or reversals effects.

When we talk about the higher level of information asymmetry and increased foreign investors' participation in selected South Asian markets, then the hypotheses of third essay connects with the thesis discussion where the impact of foreign investors'

participation on contrarian profitability is examined. The third essay hypothesis that there is a negative relationship between the degree of financial liberalization (DFL) and contrarian profitability. One school of thought on the nexus of DFL and stock returns claims that foreign investors' participation through financial market liberalization may improve market efficiency by enhancing the quality of publicly available information through more openness, which can reduce the potential of higher returns for stock selection strategies. Moreover, the existing literature also comments on foreign investor participation and local and foreign investor behavior. As per Richards (2005), foreign investors are found to be momentum investors because of their experience and higher knowledge about the dynamics of emerging stock markets. Moreover, Grinblatt and Keloharju (2000) and Ikizlerli et al. (2019) reveal that local investors are contrarian investors and their behavior tendency is stronger than institutional investors. As the higher information asymmetry prevails in the selected stock markets and participation of retail investors remains low, therefore, it is an important question to explore whether the increased foreign investors' participation in the shape of higher degree of financial liberalization improves the quality of publicly available information.

1.8 Contribution of the Thesis

The current research contributes to the existing literature on market efficiency and trading anomaly returns in the emerging market context. As per the existing evidence in the literature about the dependency of profitability and significance of market anomalies on changing market conditions, this research contributes by examining these AMH-consistent arguments on the neglected stock markets of South Asia, within the framework of the contrarian effect. The research findings on the contrarian effect in different emerging markets of various countries seem to present a variety of

explanations for the existence of contrarian anomaly. In particular, analyzing whether the statistical significance of contrarian anomaly profits depends on time-varying market conditions in emerging South Asian markets, the research finding may provide partial support to AMH, which would fill some gaps between the varying arguments of EMH and behavioral finance.

Furthermore, the examination of time-varying behavior of contrarian anomaly, and whether the investors from the emerging markets adapt towards changed market conditions like the investors in developed markets, the research findings can shed light on the debate of AMH whether market efficiencies and inefficiencies coexist in South Asian emerging equity markets. In addition, Asian emerging markets are characterized by noise trading, retail investing, and mean-reverting stock prices. These factors motivate the market intermediaries and informed investors about earning speculative and manipulative profits (Khwaja & Mian, 2005; Akhter & Yong, 2019). Therefore, the sample selection from emerging Asian markets has an added significance for current research. Due to the lower degree of correlation with other developed and frontier equity markets (Harvey, 1995), the empirical results from such markets can provide further validation to the theory that findings are not necessarily due to higher correlation with previous study samples.

This thesis also investigates the effectiveness of comprehensive style investing strategies that involve splitting the overall stocks into various style portfolios based on different firm-specific and industry-specific characteristics. Liquidity- and market value-conscious portfolios are formed in order to examine whether liquidity and market value of stocks has any predictive power towards contrarian profitability. Similarly, the impact of various market conditions are also analyzed on industry-specific contrarian portfolios. These analyses along with industry-neutral contrarian effect will provide

further robustness of prior findings on the investigation of industry contrarian effect. Furthermore, the study also contributes to the literature by examining the role that regional macroeconomic and global risk factors play towards the predictability of reversals in South Asian stock markets. In this way, this work connects the two streams of literature that link reversals with state-dependent macro variables and global risk factors, and it offers fresh insights into contrarian strategy's predictability in the context of emerging markets.

Another contribution of this research is the use of various measures of the degree of financial liberalization and binary modelling analysis to uncover the ambiguous relationship between financial liberalization and contrarian strategy payoffs. By doing so, the study shows that varying degrees of financial liberalization help to explain the presence of contrarian profits in emerging markets. Several studies examine the effect of financial liberalization on market returns, cost of capital or volatility (Bekaert & Harvey, 2000; Bae et al., 2004; Chari & Henry, 2004; Stiglitz, 2004; Bekaert et al., 2005; Moshirian, 2007). However, the literature has paid less attention to the possible effect of financial liberalization on the profitability of various stock selection strategies, particularly the contrarian strategy. This thesis extends this line of literature by investigating the impact of stock market liberalization on the profitability of contrarian strategy.

Furthermore, most of the existing research treats the financial liberalization process as a one-time event and assumes that liberalization occurs fully at one point in time. However, the studies like Bekaert and Harvey (2002), Edison and Warnock (2003) and Bae et al. (2004) reveal that the speed and implementation of financial market liberalization differ, depending on local market conditions. Many researchers believe that financial market liberalization is like a process instead of an event for many

emerging markets. By keeping these arguments in mind, this research again extends the literature by testing the relationship between contrarian returns and financial liberalization with two methods, through event-window examination of financial liberalization and with the incorporation of the time-varying measures of financial market liberalization. The degree of financial liberalization shows the gradual removal of cross-border transaction restrictions over time. By applying various measures of the degree of financial liberalization, the research not only postulates the steady nature of liberalization process but also remove the imprecision issues in dating of financial liberalization.

Moreover, along with contributing to the academic literature, the results of this research may guide regulators and policymakers in policy implications. For instance, in the case of a positive effect of financial liberalization, the government can remove restrictions on foreign equity investment to safeguard market efficiency by raising the quality of public information, especially in emerging markets. The impact of financial liberalization on trading strategy returns is also relevant for portfolio managers to consider since higher or lower investment strategy returns due to varying degrees of financial liberalization can provide them different evaluation matrices in order to adjust their overall portfolio risk and return profiles.

1.9 Organization of the Thesis

The rest of the thesis is structured as follows. Chapter 2 provides the theoretical background and critical review of the literature on the role of various stock market circumstances for contrarian anomaly returns. Since this thesis is presented in the form of three related research articles (each addressing a specific research objective), Chapter 3, Chapter 4 and Chapter 5 are respectively dedicated to essay 1 (1st objective of the research), essay 2 (2nd objective of the research) and essay 3 (3rd objective of the

research). Each of these three chapters contains separate sections for the introduction, methodology, results and discussion, and conclusion. Finally, Chapter 6 concludes the research and discusses policy implications and future areas of the study.

CHAPTER 2: LITERATURE REVIEW AND HYPOTHESES DEVELOPMENT

2.1 Overview of Chapter

In this chapter, previous studies related to EMH, AMH, herd behavior, various market circumstances, firm, industry, macroeconomic factors, and contrarian investment strategies are reviewed. The literature on the possible effect of various stock market conditions on time-varying change in contrarian anomaly returns is scant and inconclusive. This research highlights those specific circumstances of emerging stock markets that give rise to the possibility of higher contrarian returns. The literature review is categorized into six sections: Section 2.2 provides the theoretical background related to the effect of different stock market circumstances on time-varying change in contrarian payoffs; Section 2.3 reviews the literature on stock market anomalies and concludes the linkage between emerging markets and contrarian effect; Section 2.4 discusses the literature on AMH and justifies its association with contrarian effect; Section 2.5 thoroughly elaborates the literature on the impact of firm-specific, industry-specific and macroeconomic variables on stock return, and concludes the section with a discussion on limitations of existing literature. Finally, Section 2.6 reviews the empirical literature on the process of stock market liberalization and its impact on various factors of stock market quality, it also justifies the association of stock market liberalization with contrarian effect.

2.2 Theoretical Background

The idea of efficient capital markets is a well-researched field of economics and finance. However, the meaning of market efficiency has been debated over the years since the introduction of a well-known framework, "The Efficient Market Hypothesis (EMH)" proposed by Fama (1970). In the initial years of EMH, the principle of the stochastic process of asset price fluctuations was considered as a base for market

efficiency. The rationale for market efficiency was that the prices of assets should follow a random walk in an efficient market because the prices already reflect all the available information. Hence, it is not possible to predict stock prices based on the new set of information. Therefore, gathering information is fruitless in efficient markets as these instantly incorporate the new set of information into asset prices. Grossman and Stiglitz (1980) suggest that perfectly functioning markets are impossible because there would be no incentive for traders to buy costly information if prices already reflect all the available data. Numerous studies have revealed that the prices of assets do not follow a random walk and that price variances (and thus returns) are predictable (Fama & French, 1988) and that it is possible to use various trading strategies based on such predicted return variances (Jegadeesh & Titman, 1993). These results have led to an eruption of literature in both developed and emerging countries questioning the validity of EMH (see e.g., Fox & Opong, 1999; Lim et al., 2008; Borges, 2010). These studies employed statistical tests to determine whether the markets are efficient over certain predefined intervals with the expected outcome that market efficiency is viewed as an all-or-none situation.

In recognizing the impossibility of perfect market efficiency, Champbell et al. (1997) propose the concept of relative market efficiency, which has led to a change in emphasis from the idea of absolute market efficiency (an all-or-none phenomenon) for measuring various degrees of stock market efficiency. Moreover, the latest empirical evidence suggests that market efficiency differs across markets and over time (Lim & Brooks, 2011). On the basis of the evolving model of how market efficiency can be described, Lo (2004) has introduced a new paradigm, the Adaptive Market Hypothesis (AMH). As per Lo (2004), the prior plethora of studies on market efficiency has generated debate among various scholars. For instance, the basic rationality assumption of EMH can be questioned based on the behavioral finance argument that the

individuals are not entirely rational; therefore, do not always bound to make rational decisions. The AMH blends the rationality notion and behavioural biases in an evolutionary heuristic approach. The reasoning behind AMH is built on the principle of sociobiological evolution of organism behaviors, connecting the evolutionary viewpoint with finance and economics; individual optimization is not conducted analytically, but rather by error and trial approach (natural selection). Therefore, the AMH clarifies certain inconsistencies between the rationality assumption of EMH and the presence of behavioural biases in finance and economics. Further, it explains the circumstances where markets are predictable (previously known as market inefficiency) and the circumstances where the markets are in equilibrium and stock prices follow random walk without showing any predictability of stock returns (previously known as market efficiency).

Prior studies show that contrarian or momentum profits vary considerably across markets. For example, Chui et al. (2000), Griffin et al. (2003), Locke and Gupta (2009), Asness et al. (2015) and Yu et al. (2019) document strong contrarian effect in Asian emerging markets, while the opposite effect is found in developed markets. The findings in recent literature provide various risk-based (Jegadeesh & Titman, 1993; Avramov & Chordia, 2006) and behavioural (Nofsinger & Sias, 1999; Hong et al., 2000) explanations for momentum and contrarian returns over the past few years. However, it is still a matter of great debate in the literature how trading strategies produce abnormal returns based on historical prices by exploiting stock market inefficiencies.

The researchers complying with classic financial theories encouraging unbounded rationality seek novel risk relating factors for asset pricing models to interpret the abnormal gains of stock market anomalies. On the other hand, the researchers adhering

to bounded investor rationality attempt to interpret stock market anomalies with behavioral models by capturing investors' behavioral biases. Neither the proponents of the efficient market hypothesis (Fama, 1970, 1991; Fama & French, 1996, 2012) nor the behavioral school of finance (DeBondt & Thaler, 1985, 1987; Jegadeesh & Titman, 1995; Barberis et al., 1998; Daniel et al., 1998; Hong & Stein, 1999) can offer a satisfactory interpretation for these anomalies. For example, Fama and French (1993, 2017) tried to link the abnormal profits of these anomalies with time-variant market risk factors and attempted to explain it with multi-factor models. However, the proposed factor models cannot fully explain these anomalies. In contrast, DeBondt and Thaler (1985, 1987) and Jegadeesh and Titman (1995) claim that the overreaction of investors to stock-related information is the leading cause of contrarian anomaly returns. Nevertheless, according to them, it is unclear why investors overreact.

Lo (2004), in his seminal paper, argues that market anomalies like momentum and contrarian often represent the deviation from market efficiency. This departure from market efficiency under varying stock market conditions can offer justifications for market anomalies returns. In this context, he proposes the AMH theory, which claims that the level of market efficiency or inefficiency varies in financial markets because the investors may not be entirely irrational or rational. Still, future-oriented and wise investors can gain knowledge from their prior experiences. The essential assertion of the AMH is that market efficiency is not an all or none phenomenon, but it changes across markets based on the local stock market conditions. As per the given evidence about the dependency of profitability and significance level of market anomalies on changing market conditions, it is expected that in contrarian driven Asian emerging markets, the profitability of contrarian strategy will be time-varying as specified by the AMH. As these markets are highly volatile with some unique market dynamic characteristics such as noise trading, retail investing, mean reversion, speculative

bubbles, and information asymmetry, the excess returns for stock market anomalies like momentum and contrarian strategies are expected to increase significantly.

2.3 Literature Review on Investment Strategies

Various studies document the behavior of investors based on past returns. DeBondt and Thaler (1985) provide their seminal work on the issue of experimental psychology to examine whether contrarian behavior matters at a market level or not. They use monthly stock returns data of common stocks listed on the New York Stock Exchange (NYSE) compiled by the Center for Research in Security Prices (CRSP) over the period January 1926 to December 1982. They examine the cumulative average returns (CAR) of loser and winner portfolios on the basis of 36 months formation period. By using the holding period of 36 months, they find that loser portfolios outperform the past winners and earn about 24.6% higher returns. Their study demonstrates that stock prices overreact to new information and contrarian investment strategies of buying past losers and selling past winners earn abnormal returns. The loser portfolios were found to have positive accumulated abnormal returns while winner portfolios earned negative cumulative average returns. The outperformance of loser portfolios with long-term formation period was more significant than the portfolios with short-term formation period. Furthermore, the mean reversion of loser portfolios was three times stronger than winner portfolios based on the past 36 months CARs.

In their subsequent paper on market overreaction, DeBondt and Thaler (1987) apply some other factors such as market risk, seasonality and firm size in order to re-evaluate their tests conducted in the previous paper. The excess returns of January were negatively associated with the returns of December, showing a capital gains tax lock-in effect for the returns of past winners. However, the tax-loss selling effect for the losers was not present in this study. This study generally supported the fact that the

overreaction hypothesis holds, and the mean reversion of past losers and winners were not explained by market risk and size factors. However, contrary to what Chan (1988) states, the risk of winner portfolios decreases while the risk of loser portfolios increases over time. In this context, it is also necessary to evaluate the factors that cause mean reversion in stock prices. When these risk changes are controlled, the excess returns between the winner and loser portfolios become insignificant from January 1933 to December 1985.

On the other hand, Jegadeesh and Titman (1993) implement the relative strength strategy to evaluate the returns of the momentum strategy. They use 3 to 12 months' past returns of the stocks listed in the American Stock Exchange (AMEX) and NYSE from the period January 1965 to December 1989. The results of this study reveal that the short-term relative strength strategies earn significant excess returns in the first year after formation and subsequently in the next two years. In conviction with the positive correlation between the degree of mean reversion and length of formation period found by DeBondt and Thaler (1985), these findings establish a building that the short-term momentum portfolios that are non-exhausted show better performance soon after formation.

Bikhchandani and Sharma (2000) argue that there is an apparent disparity between empirical approaches and theoretical models when testing for herding behavior and feedback trading. Brennan and Cao (1997) use theoretical models and suggest investment strategies for local and foreign investors. They indicate that foreign investors should follow momentum investment strategies as they have less information as compared to local investors. The study of Froot et al. (2001) also reveals the similar finding that foreign investors tend to be momentum investors.

It has been a long debate on whether contrarian or momentum investment strategies earn an abnormal return. Muga and Santamaría (2007) conduct their research on equity markets of Latin America, and they find that momentum investment strategies earn excess returns in these markets. These findings are consistent with several other U.S-based studies (Grundy & Martin, 2001; Grinblatt & Moskowitz, 2004; Fama & French, 2008). The results of some other studies also show the success of momentum strategies in relatively more developed markets. The studies of Ramiah et al. (2011) and Bernstein et al. (2013) find consistent evidence of the momentum effect in Australian and other international equity markets. Moreover, Doan et al. (2014) study the behavior of the Australian equity market to analyze the coexistence of momentum and contrarian strategies. They concluded that contrarian strategies dominate in the short-term investment period, while momentum investment strategies prevail in long-term and intermediate investment horizons. Overall, the existing literature exhibits that momentum strategies dominate in more developed and well-governed stock markets.

To compare the behavior of developed and emerging markets, Chan et al. (2000) investigate the profitability and presence of momentum investment strategy in stock indices of the international equity market over the period January 1980 to June 1995. They select 23 equity market indices as these were feasible for constructing the relative strength strategies. These 23 indices include 11 countries indices from Europe, nine countries indices from the Asia-Pacific region, two from North America and one country index from South Africa. The investment strategies were constructed on the basis of momentum strategies, i.e., buying the indices of winner countries stocks and selling the indices of loser countries based on 1-, 2-, 4-, 12- and 26-week past returns of the indices. The results of this analysis suggest that the returns of these momentum investment strategies are significant for only short-term holding periods (holdings of less than four weeks).

Specifically, for Asian Stock markets, the studies find weak-form market inefficiencies with very low momentum profits (see e.g., Chui et al., 2000; Griffin et al., 2003; Shah & Shah, 2017). Chui et al. (2000) were the first who analyze the momentum strategy effect in eight (8) Asian Stock markets from the period 1978 to 2000. They formed 6-6 month's relative strength strategies with top 30% and bottom 30% as winner's and loser's stocks, respectively. They find a shallow momentum effect in the Asian equity markets, significant only in the case of Hong Kong, which is relatively considered a more developed market within the Asian region. However, evidence supports a strong reversal (contrarian) effect in these Asian Stock markets. Moreover, Griffin et al. (2003) study the momentum effect worldwide by forming 6-6 strategies based on the data of the following regions: United States, Asia, Africa and Europe. In this strategy, the stocks are sorted into portfolios based on past six months' returns and held for the next six months. They find moment trading profits in almost all the regions except Asia, where the effect was very weak.

Yu et al. (2019) also find the same trend in three Chines stock markets, namely the Shenzhen Stock Exchange (SZSE), SZSE Growth Enterprise (GEM) and Shanghai Stock Exchange (SSE). Hameed and Ting (2000) report contrarian strategy profits in the short-term for the Malaysian equity market, while Locke and Gupta (2009) find contrarian trading returns in the Indian equity market. Shah and Shah (2017) report long term reversals effects in Pakistan's stock market. Within the Asian region, the South-Asian equity markets like Bangladesh, India and Pakistan are mostly dominated by noise traders and small investors. This noise trading contributes towards enhanced risk in a shorter time horizon (Cuthbertson & Nitzsche, 2005; Iqbal, 2012; Brzeszczyński et al., 2015; Chowdhury et al., 2019), while the investment decisions of small investors are usually driven by sentiments and past share price movements in the equity market (Shiller, 1990; Brzeszczyński et al., 2015; Chowdhury et al., 2019; Naik & Reddy,

2021). These equity markets further express the unique structural and psychological differences compared to developed equity markets (Chui et al., 2000). Based on these structural and psychological differences, consistent with the existing literature, these markets behave opposite to developed markets and usually show contrarian effect, which produces unique intuitions regarding stock market anomalies returns. The next few sections discuss the impact of various AMH suggested factors on contrarian anomaly returns, such as market conditions, firm- and industry-specific characteristics and other internal and external factors relating to specific stock market environment. It is expected that the selected factors may play a significant role in the return dynamics of emerging stock markets.

2.4 Adaptive Market Hypothesis (AMH) and Contrarian Effect

The fundamental strand of the EMH is that the market players are active and always ready to exploit the excess return opportunities on the basis of their newly acquired information relating to stock price fluctuations (Fama, 1965). In a perfect market with zero trading cost, stock prices represent all the existing information. Therefore, it is not possible to make excessive gains from any information, which is also referred to as the strong-form market efficiency. However, due to the high cost of obtaining financial market information, investors are not motivated to pay such cost until the marginal benefits outweigh the marginal cost of obtaining the new information; hence, weak-form market efficiencies are more common (Grossman & Stiglitz, 1980).

As per the adaptive market hypothesis (AMH), efficiencies and inefficiencies can exist simultaneously in stock markets because the participants are not entirely irrational or rational; however, future-oriented and wise investors learn based on their prior experiences. Empirical researches on AMH reveal that the uncertainty and predictability of stock returns differ under varying conditions of a stock market, for instance, bear and

bull market, equity market bubbles and bursts, etc. (Kim et al., 2011; Urquhart & McGroarty, 2014, 2015; Ito et al., 2016; Lin et al., 2021). AMH has unlocked a new stream of opportunities for scholars to offer a more realistic interpretation from a novel point of view for deviant stock return behavior.

The AMH recognizes the presence of cognitive biases that can derive from heuristics and could be adapted in non-financial settings (Lo, 2004). When market participants and investors make investment decisions, they build satisfactory choices for them (bounded rationality), which may not prove to be the optimal choices (rational expectation) (Simon, 1955). The latest researches reveal that the investor's personality traits and the factors relating to investor's specific environmental circumstances, which are AMH's main considerations, play a major role in incorporating the new information into prices and determining the investor's behavior towards stock market anomalies (Urquhart & McGroarty, 2014). In contrast, the market efficiency treats every market in a similar manner (Lo, 2004); therefore, the varying behavior of stock market participants in different markets towards stock market anomalies is treated as the departure from market efficiency.

Although the presence of behavioral biases in financial markets is a common phenomenon, participants with sound knowledge of the financial market can detect return or price anomalies over time and can arbitrate the abnormal gain by examining the prior price movement (Daniel & Titman, 1999; Hao et al., 2018). Like other stock market anomalies, the statistical significance and profitability of contrarian and momentum anomalies change over time (Asness et al., 2015). Daniel et al. (1998) employ different cognitive and behavioral biases to explain momentum and contrarian anomalies. According to the theory of Daniel, Hirshleifer, and Subrahmanyam (1998; DHS hereafter), investors' overconfidence about their private information leads them to

overreact to that information. If these investors further possess a self-attribution bias, they will attribute success to their own abilities and failure to external noise. This increased overconfidence further enhances the initial overreaction, which generates greater momentum returns for a short period. However, the stock price overreaction eventually corrects in the subsequent period when the investors observe the actual position in the market and realize their errors. This DHS theory can be extended to explain the differences in momentum or contrarian payoffs across varying market states. The aggregated overconfidence of investors should be larger following the market gains (Gervais & Odean, 2001). Because investors in aggregate take long positions in stocks, so the market price increase will be unduly attributed to investor skills, leading to greater aggregate overconfidence. If this happens in fact that the overconfidence gets higher following market gains, the momentum profits due to overreaction will be higher during up market state in the short run. This implies that the changed market conditions, for instance, the bull market, the bear market, stock market bubbles, stock market crashes and normal stock market conditions, etc., might impact the investment choices of investors because the investors attempt to adapt to the changing market environment.

In this context, Cooper et al. (2004) divide the market into 'up' (positive) and 'down' (negative) market states based on the prior one to three-year market return and reveal that momentum returns are mainly associated with the "up" market state. Huang (2006) confirms the same finding by using the data of 17 MSCI states from 1969 to 1999. He shows that higher and significant momentum profits are linked to the 'up' market. Antoniou et al. (2013) state that momentum profits strengthen in optimistic periods of the stock market. Along with 'up' and 'down' market state, the cycles of market volatility (high/low) and bubbles as well as crashes might also have an impact on momentum or contrarian payoffs. The direct motivation of these possible effects arises from the fact that a dramatic loss to momentum strategies followed high U.S market

volatility in late 2008. Furthermore, the momentum strategy returns further deteriorated during the bankruptcy crisis of Lehman Brothers in 2009, where the momentum strategy miserably performed with an average monthly payoff of -17%. The momentum investment strategy performs poorly in some other periods of skyrocketed volatility, such as in the early 1930s, mid-1970s, and after the NASDAQ bubble burst around the turn of the century (Wang & Xu, 2015; Demirer & Jategaonkar, 2020; Lin et al., 2021).

Due to these drastic episodes that suggest the market state impact on momentum profits, this thesis expects that the profitability and significance level for contrarian strategy will vary when market conditions change. At the same time, it is expected that the contrarian effect will prevail primarily during the "down" (negative) market state, higher volatility and crisis periods. If the stock markets are adaptive in nature, as indicated by the AMH, the behavior of contrarian anomaly will change, although the anomalous returns do not fade away entirely over time. This argument leads to the thesis's first hypothesis:

Hypothesis 1: The profitability and level of significance of contrarian strategy vary with the changing market conditions.

- **H_{1A}:** There is a negative relationship between contrarian profitability and market state (Positive/Negative).
- **H_{1B}:** There is a positive association between contrarian profitability and stock market volatility (High/Low).
- **H_{1C}:** There is a positive relationship between contrarian profitability and crisis periods (e.g., Asian crisis and the global financial crisis).

2.5 Firm, Industry, and Macroeconomic characteristics and contrarian effect

2.5.1 Firm-specific characteristics and contrarian effect

The recent literature narrates that the firm-specific factors such as profitability, book to market ratio and size play an important role in the predictability of investment strategies (Asness et al., 2013; Cakici et al., 2016). However, relatively fewer studies have explored the predictive ability of trading volume and market value factors towards contrarian profitability. Barberis and Shleifer (2003) claim that the US equity investors categorize stocks and other assets based on different investment styles such as market capitalization and book to market ratios. As the regular contrarian or momentum effect is not a constant trait of South Asian stock markets, it is interesting to examine the profitability of style investment strategies in these markets. The rationale is that when investors categorize stocks into different styles, contrarian effect would be included in it. The current study first examines the profitability of market value-based style contrarian strategies. Market value is considered an important stock characteristic because retail investors in emerging markets prefer to invest in small-cap stocks. Although, small-cap stocks generally generate higher profits, but they also have the larger cross-sectional standard deviations. Because investors are typically taking long position in small-cap companies, the methods may be considered as high-risk.

Turnover and trading volume are the two proxies for liquidity that have been widely utilized to forecast expected stock returns in recent literature. According to the traditional liquidity argument, stock liquidity has a negative relationship with the expected stock returns. Regarding the nexus of liquidity and momentum profitability, the study of Lee and Swaminathan (2000) investigate the liquidity-based momentum effect and reveal that high-volume stocks show stronger momentum effect. This finding is against the conventional hypothesis of liquidity. On the other hand, Demir et al.

(2004) and Tan and Cheng (2019) state that liquidity measures do not interpret momentum profitability in the stock market of Australia. Li et al. (2009) find that the trading volume is negatively associated with momentum profitability in the UK. However, May et al. (2018) claim that stocks with higher liquidity perform better in price momentum strategies. In a similar vein, Chan et al. (2000) analyze 17 foreign equity market indexes to provide comparable findings, and reveal that stocks with high liquidity yield higher earnings. In emerging markets perspective, Sehgal et al. (2014) investigate the behavior of various equity market anomalies in six emerging markets – Brazil, China, India, Indonesia, South Korea and South Africa. Their findings show that liquidity anomaly outperform other anomalies in South Africa and South Korea, while accruals and profitability anomalies perform better in other emerging markets. Butt et al. (2021) examine the cross-sectional and time-series chrematistics of momentum profits in 19 emerging markets. Their findings reveal that momentum profits are comparatively lower in sample emerging markets while lower momentum profits can be attributed to market and liquidity factors, which are evident only in down-market conditions. The above debate demonstrates that the direction of relationship between liquidity and momentum profitability is inconclusive. Moreover, the studies are rare that discuss the relationship between trading volume and contrarian strategy profitability in the context of information asymmetry.

Trading volume is used in this study as a proxy for liquidity because it is also considered to be a valuable indication of information for equities (Lee & Swaminathan, 2000). Information content is associated with misperceptions by investors regarding a company's possible future financial success. As a result, the greater the level of investor disagreement over the fundamental value of stocks and, consequently, the larger the volume or turnover, the more uncertain the environment for the firm's valuation. Consequently, frequently traded equities will face extreme mispricing, which may result

in strong short-term momentum but will ultimately have a contrarian effect following the market correction of overpriced and underpriced stocks. Based on these justifications, this study expects that stocks with lower trading volume would generate higher contrarian returns because they face less information asymmetry.

H_{2A}: Firm-specific factors such as trading volume and market value influence the profitability of contrarian investment strategy in South Asian stock markets.

2.5.2 Industry classification and Contrarian effect

There are some studies in the literature that grouped stocks based on their industry membership and conclude that industry-based classification leads to higher profits for investment strategies (Moskowitz & Grinblatt, 1999; O'Neal, 2000; Du & Denning, 2005; Demirer et al., 2015). Demirer et al. (2015) reveal that profitability of industry-based momentum investment strategy is high in China because of herding within industries. Some other studies relating to industry momentum also provide the consistent findings (O'Neal, 2000; Du & Denning, 2005; D. Su, 2011; C. Su, 2021). However, another stream of literature claims that momentum effect cannot always be attributed to industry influence. For instance, Nijman et al. (2004) conduct their research on European stocks and argue that individual stock momentum is more dominant than industry impact in the European region. In a similar vein, Grundy and Martin (2001) reveal that the two cases are distinct and provide fundamentally different results. In the context of Taiwan stock market, Chen and Demirer (2018) find little evidence of industry-based momentum returns, but they find significant profits of herding-based investment strategies. In the context of global equity markets, Gebka and Wohar (2013) conclude that investors show stronger irrational behavior in the oil & Gas, Consumer Services, and Basic Materials industries. While the findings of this study indicate certain industry features, they do not give a comprehensive picture of

industry herding. Li et al. (2014) used the dual listed stocks in Australian stock market and examined the stock and industry-level momentum effect. Their findings show a weak industry-level momentum effect but comparatively a strong stock-level momentum return. To put it another way, they do not see any significant evidence that industry classification drive momentum returns. In order to maximize the momentum profitability, Safieddine and Sonti (2007) analyze the industry growth factor and reveal that the higher momentum returns are associated with the higher industry growth rather than the maturity level of industries. The main rationale for this finding is that sectors with higher growth rate are more likely to be linked with increased ambiguity and mispricing, therefore a stronger momentum impact can be observed in such industries.

In the context of Asian emerging markets, by utilizing the daily data, Zheng et al. (2017) investigate herding behavior within industries for nine major emerging markets of the Asian region (Japan, China, South Korea, Hong Kong, Taiwan, Singapore, Indonesia, Malaysia, and Thailand). Their findings reveal that industry herding usually exists in sample emerging markets, although it is stronger at industry level instead of local or international market levels. Moreover, herding effect was mostly dominant in the Financial and Technology industries rather than in the Utility industry within each stock market. By using the data of 24000 stocks from the EU and the Asia-Pacific regions, Apergis et al. (2020) examine the existence of momentum and reversals trends in the local and international industry portfolios. Their findings show that only few industries can predict the market based on momentum strategies. The overall debate regarding industry momentum is inconclusive as the literature reports mixed findings. The current study focuses on contrarian investment strategy instead of momentum and examines whether industry-level classification influence the profitability of contrarian investment strategy in contrarian-driven South Asian equity markets. Moreover, in an attempt to further refine the profitability of industry-level contrarian strategies, this

study not only investigates the industry-neutral contrarian effect but also examines the effect of varying market states on the industry-level contrarian effect in sample countries.

H_{2B}: Industry-level classification of stocks influences the profitability of contrarian investment strategy in South Asian stock markets.

2.5.3 Macroeconomic and Global risk factors and predictability of Contrarian returns

Macroeconomic and global variables have a significant impact on investment decisions, since changes in these global factors affect equity markets differently depending on the government policies and economic conditions of the countries. The results of several studies in the literature provide support for a contemporaneous relation between movements in equity prices and changes in macroeconomic factors (Bilson et al., 2001; Fifield & Power, 2006; Zeng et al., 2022), as well as the association between current share price changes due to prior movements in macroeconomic factors (Fama, 1981; Rapach et al., 2005; Wang & Xu, 2015). By adopting different econometric methodologies, the findings of above studies demonstrate that the effect of different groups of macroeconomic factors on changes in share prices differs across markets. Poon and Taylor (1991), for example, reveal that the impact of macroeconomic variables on share prices is different in the UK as compared to the US stock market. Moreover, Humpe and Macmillan (2009) discover a long-term association between equity price changes and industrial production, long-term interest rate, and inflation rate. Moreover, the authors find a long-term association between equity prices, money supply and industrial production in Japanese stock market. Birz and Lott (2011) examine the news relating to unemployment, GDP, durable goods, and retail sales, and conclude that only unemployment and GDP growth news significantly impact the equity return in the US equity market. Overall, there is mixed evidence

regarding the linkage between equity price movements and macroeconomic changes in different stock markets. The debate on the direction of relationship between both the factors is also inconclusive.

The role of global economic factors towards share price movements has also gained considerable attention in emerging equity markets. For instance, foreign exchange index returns, worlds' industrial production, oil prices, world inflation, and world stock market returns have been found to be significant predictors of stock returns in emerging equity markets (Fifield et al., 2002; Fifield & Power, 2006; Khan et al., 2015; Khan et al., 2018; Bouri et al., 2020). By conducting the analysis on 13 emerging markets, Fifield et al. (2002) reveal that equity markets of Greece, Mexico, Singapore, Thailand, and Portugal are more integrated with world markets, while the stock markets of Turkey and India are segmented during the period of their analysis. The results were consistent with Nasseh and Strauss (2000), who find a significant impact of local and foreign macroeconomic factors on share price movements. Fifield and Power (2006) extended the analysis of Fifield et al. (2002) by adding some fundamental factors in 11 Asian and non-Asian emerging stock markets. Their findings reveal that global variables such as money supply, world GDP, world inflation, and world market returns significantly influence the stock returns of both sets of emerging markets. Moreover, the global factors were more imperative in the variability of Asian equity markets. In short, it was found that economic condition of developed markets had a greater influence in the performance of Asian equity markets.

Few studies analyzed the nexus between macroeconomic factors and stock returns or volatility in South Asian Stock markets (Gunasekarage et al., 2004; Ahmed, 2008; Khan et al., 2015; Khan et al., 2018; Verma & Bansal, 2021). The literature provides mixed findings regarding the relationship between macroeconomic factors and stock returns.

For example, Gunasekarage et al. (2004) performed a research on the Sri Lankan stock market and concluded that historical data rather than macroeconomic variables explain the fluctuation in stock prices in this market. Ahmed (2008) looked into the influence of macroeconomic factors on the Bangladeshi stock market and discovered that local macroeconomic variables have higher predictive power than FDI and international trade when it comes to stock returns. Sohail and Hussain (2009), and Khan et al. (2015) inflation, currency rates, industrial production, and money supply all have a substantial influence on stock market performance in Pakistan. Interestingly, the literature is scarce which examines the predictability of macroeconomic and global risk factors for contrarian strategy's profitability in South Asian equity markets. While most previous research focused at examining the influence of various macroeconomic factors on basic stock returns or volatility, the current study examines the predictability of macroeconomic and global factors over contrarian profitability in South Asian stock markets. Therefore, the study forms the following hypothesis:

H_{2C}: Macroeconomic and global risk factors have predictive ability for contrarian profitability in South Asian Stock Markets.

2.6 Financial Market Liberalization and Contrarian Effect

It has been established in most of the latest studies that the momentum strategy pioneered by Jegadeesh and Titman (1993) shows significant success in the U.S and other developed stock markets (see, e.g. Rouwenhorst, 1998; Grundy & Martin, 2001; Lewellen, 2002; Hart et al., 2003; Grinblatt & Moskowitz, 2004; Fama & French, 2008, 2012; Asness et al., 2013; Wang & Xu, 2015). However, the studies show weak-form market inefficiencies and a very low momentum effect for the Asia-Pacific emerging markets (Hameed & Kusnadi, 2002; Griffin et al., 2003; McInish et al., 2008; Chui et al., 2010; M. Liu et al., 2011; Demirer et al., 2017). Moreover, the explanation for stock

market anomalies, like contrarian strategy, varies across markets and the level of significance of anomalous profits from such investment strategies also differs over time (Asness et al., 2015).

The literature offers risk-based (Jegadeesh & Titman, 1993; Avramov & Chordia, 2006; Fama & French, 2008) as well as behavioral (Nofsinger & Sias, 1999; Hong et al., 2000; Bhootra, 2011) explanations of momentum and contrarian payoffs. To explain these anomalies, neither the adherents of the EMH (Fama, 1970, 1991; Fama & French, 1996, 2012) nor the behavioral school (DeBondt & Thaler, 1985, 1987; Jegadeesh & Titman, 1995; Barberis et al., 1998; Daniel et al., 1998; Hong & Stein, 1999) can offer a sufficient interpretation. For instance, Fama and French (1993, 2017) attempt to link the abnormal profits of these anomalies with time-variant market risk factors, but they reveal that the proposed factor models cannot fully explain these anomalies. Recent studies focus on identifying the various factors that can interpret the time-variation in momentum payoffs and subsequent returns of the past loser and winner stocks. The studies relate momentum payoffs to market risk factors (Stivers & Sun, 2010), business cycle factors (Chordia & Shivakumar, 2002), macroeconomic or country-specific variables (Liew & Vassalou, 2000; Grundy & Martin, 2001; Breloer et al., 2014) and market states and volatility factors (Kadan & Liu, 2014; Wang & Xu, 2015; Daniel & Moskowitz, 2016).

Financial market liberalization may also influence the return predictability of stock selection strategies (Hart et al., 2003; Groot et al., 2012), although its effect is previously unknown. This thesis expects that financial liberalization can influence the contrarian strategy payoffs in two ways. On the one hand, foreign investors' participation through financial market liberalization may improve market efficiency by enhancing the quality of publicly available information through more openness, which

can reduce the potential of higher returns for stock selection strategies. On the other hand, the literature often argues that the imperfections are seen more in integrated international financial markets relative to domestic (segmented) capital markets due to the high degree of information asymmetry between the local and foreign investors. Th The studies in recent literature mainly examine the impact of financial liberalization on cost of capital, volatility, or market returns (Bekaert & Harvey, 2000; Bae et al., 2004; Chari & Henry, 2004; Stiglitz, 2004; Bekaert et al., 2005; Moshirian, 2007). But the literature is scarce on the relationship between financial liberalization and the profitability of different stock market anomalies, notably the contrarian strategy. By examining the effect of stock market liberalization on the viability of contrarian strategy, this thesis extends the body of knowledge in this area. As the profitability of trading strategies represent the departure from stock market efficiency, this thesis attempts to investigate the investor-base broadening argument and expects a negative relationship between the degree of financial liberalization and contrarian profitability. This would suggest that the less liberalized markets would offer opportunities for abnormal contrarian returns for investors and fund managers due to market inefficiencies. The thesis proposes that the higher degrees of financial market liberalization would lead to more openness and efficiency of stock prices, hence limit the scope of returns for contrarian investment strategies. The research, therefore, designs the following hypotheses:

Hypothesis 3: There is a negative relationship between the degree of financial liberalization and contrarian strategy payoffs.

Hypothesis 3_A: Emerging markets with a lower degree of financial liberalization offer higher contrarian return opportunities.

Hypothesis 3B: Emerging markets with a higher degree of financial liberalization offer lower contrarian return opportunities.

CHAPTER 3: ADAPTIVE MARKET HYPOTHESIS AND TIME-VARYING CONTRARIAN EFFECT: EVIDENCE FROM EMERGING STOCK MARKETS OF SOUTH ASIA

3.1 Introduction

Contrarian and momentum investment strategies are the two types of stock market anomalies that always present challenges to the validity of the Efficient Market Hypothesis (EMH). While momentum investing technique seeks to take advantage of current market trends, contrarian investing approach takes the opposite stance. Contrarian investors assume that current market circumstances are not realistic, and as a result, they make investment decisions that are against the general market directions. Prior studies show that contrarian or momentum profits vary considerably across markets. For example, Chui et al. (2000), Griffin et al. (2003), Locke and Gupta (2009), Asness et al. (2015) and Yu et al. (2019) document strong contrarian effect in Asian emerging markets, while the opposite effect is found in developed markets. Several studies present different risk-based (e.g., Jegadeesh & Titman, 1993; Avramov & Chordia, 2006; Fama & French, 2017; Munir et al., 2020), as well as behavioural (e.g., Nofsinger & Sias, 1999; Hong et al., 2000; Bhootra, 2011; Yu et al., 2019; Lekhal & El Oubani, 2020) interpretations over the past few decades as to why the momentum or contrarian patterns exist in stock returns. However, how the historical performance of stocks contributes to their subsequent performance is still a puzzle in academic literature, which allows trading strategies to generate abnormal returns by exploiting market inefficiencies.

A more comprehensive theory needed to be developed to interpret the time-varying behaviour of stock market anomalies. In this regard, Lo (2004) proposed the Adaptive market hypothesis (AMH) theory, which claims that the efficiency and inefficiency can

coexist in financial markets. Market competition, innovation, natural selection, market participants and their adaptation cause the wax and wane in the degree of market efficiency and profits of investment strategies. The major practical assertion of AMH is in utilizing profitable trading strategies timely, as the return opportunities vary over time. Based on this evolutionary perspective, the abnormal return opportunities arise over time but vanish when they are exploited. Moreover, the emergence of profitable investment strategies is dependent on the specific stock market environment. Hence, in contrast to the EMH's argument that active management is useless, the AMH supports the portfolio's active management. Furthermore, Lo (2005) claims that the convergence to exact equilibrium is neither guaranteed nor likely to happen; therefore, it is wrong to conclude that the market would shift towards some optimal efficiency state.

Several studies in recent literature inspect the profitability of trading strategies; however, very few of these studies focus on examining such profitability within the framework of the AMH (Todea et al., 2009; Urquhart & McGroarty, 2014; Al-Khazali & Mirzaei, 2017; Shahid & Sattar, 2017; Xiong et al., 2019). The procedure relating to this examines whether trading strategies' risk-adjusted profits are time-varying. These studies provide empirical evidence based on foreign exchange market (Neely et al., 2009; Neely & Weller, 2013) and stock market indexes in the U.S. and other developed markets (Todea et al., 2009; Patari & Vilska, 2014; Taylor, 2014; Anghel, 2015). However, the studies are rare that focus on the profitability of momentum and contrarian investment strategies within the framework of AMH (Shi & Zhou, 2017; Akhter & Yong, 2019). For example, Akhter and Yong (2019) investigate the evolution of momentum strategy returns over time based on the AMH framework. However, more studies need to be conducted on the evaluation of contrarian returns to the implications of the AMH, particularly in South Asian stock markets. Therefore, this study fills this

gap in the literature by examining the dynamic market assumption of AMH within the framework of contrarian effect.

This study focuses on the stock markets of Bangladesh, India and Pakistan for two reasons. First, several studies argue that these stock markets are mostly dominated by small investors and noise trading (Cuthbertson & Nitzsche, 2005; Iqbal, 2012; Brzeszczyński et al., 2015; Chowdhury et al., 2019). The investment decisions of small investors in the South-Asian markets are driven by either sentiments or past share price movements which leads to greater price volatility in these markets (Shiller, 1990; Brzeszczyński et al., 2015; Chowdhury et al., 2019; Naik & Reddy, 2021). In addition, the noise trading further contributes towards enhanced risk in the short term, thereby offering unique justifications for the time-varying return patterns of stock market anomalies. Second, South Asian stock markets are relatively young, therefore many studies argue that some idiosyncratic phenomena characterize these markets. For instance, weak-form market inefficiencies (Chui et al., 2010; M. Liu et al., 2011; Rahman et al., 2020), mean-reversion of stock prices (Chui et al., 2010), non-randomness of returns (Joshi, 2011; Akhter & Yong, 2019), and speculative and manipulative bubbles (Khanna & Sunder, 1999; Khwaja & Mian, 2005) are common issues in these emerging markets. Based on these structural and psychological differences, the selected emerging markets are expected to produce unique intuitions regarding stock market anomalies as compared to their developed market counterparts.

The current study constructs a sample from 1997 to 2018 for Bangladesh, India and Pakistan stock markets and confirm the existence of a strong contrarian effect, which is statistically significant in all the markets. Interestingly, contrarian strategies gain significantly higher profits during crisis periods, more than twice as compared to non-crisis periods. Upon examining the payoffs to winners and loser portfolios, the study finds that higher contrarian returns are primarily associated with the outperformance of

past loser portfolios particularly during negative market states and crisis periods. The study findings based on CAPM and augmented Fama and French three-factor (AFFTM) models further indicate that the risk-adjusted profits vary over time, while the factor loading on different risk factors is non-constant. These results partially support the AMH.

The research contributes to the existing literature in several ways. Firstly, the examines the AMH theory on the emerging South Asian stock markets within the framework of the contrarian effect. The study findings conclude that the raw and risk-adjusted returns of contrarian strategy are time-varying, where price-and volatility-states connect with the local market environment to play a significant role in explaining the return dynamics of selected emerging markets. Secondly, the study investigates whether the profitability and significance level of contrarian profits vary in different market conditions as suggested by the AMH. The dependency of contrarian returns on time-varying market conditions in South Asian emerging markets offers support to AMH, which bridges some of the gaps between the conflicting arguments of the advocates of EMH and behavioural school. Along with contributing to the academic literature, the study findings guide the investment community, which intends to exploit returns through a combination of various trading schemes. The outperformance of contrarian strategy under varying market states offers different performance matrices to individual investors and fund managers to form winners and loser portfolios in both the panic as well as stable market states.

The rest of this study is organized as follows. In Section 3.2, the study describes data and summary statistics. In Section 3.2.1, the study examines the relationship between the contrarian effect and the time-varying risk premium. In Section 3.3, the study investigates the context-dependent contrarian effects. Section 3.4 provides conclusions and implications of the current study.

3.2 Data and Methodology

To investigate the contrarian returns and their risk-premium relation in the Bombay Stock Exchange (BSE), Pakistan Stock Exchange (PSX) and Dhaka Stock Exchange (DSE), the study obtains monthly data from Thomson and Reuters DataStream. The dataset contains the adjusted closing prices of all the shares listed on each stock market, and monthly Fama and French three factors, that are formed based on Fama and French (1993). The study period extends from 1997 to 2018. To control the impact of inconsistent and small stocks, the study eliminates the stocks showing inconsistent trading history. This procedure also helps us to maintain the sample of stocks which usually eliminates the least liquid stocks. This leaves the author with a total sample of 2,522 stocks originating from three stock markets over a research period covering 264 months. The monthly closing prices of all listed stocks and market indices, adjusted for dividend, are changed into returns by utilizing the below Equation of continuous compounding return:

$$R_t = 100 \times ln(\frac{P_t}{P_{t-1}}) \quad (3.1)$$

Where,

R_t = represents the return of an index or stock[1]

P_t = the dividend-adjusted close price an index or stock at time t

P_{t-1} = the dividend-adjusted close price of an index or stock at time t-1

[1] Here, the return of stock is used to construct the desired portfolios, while the index return identifies the variables of market state and volatility that are further used to examine the impact of market state and volatility on contrarian effect.

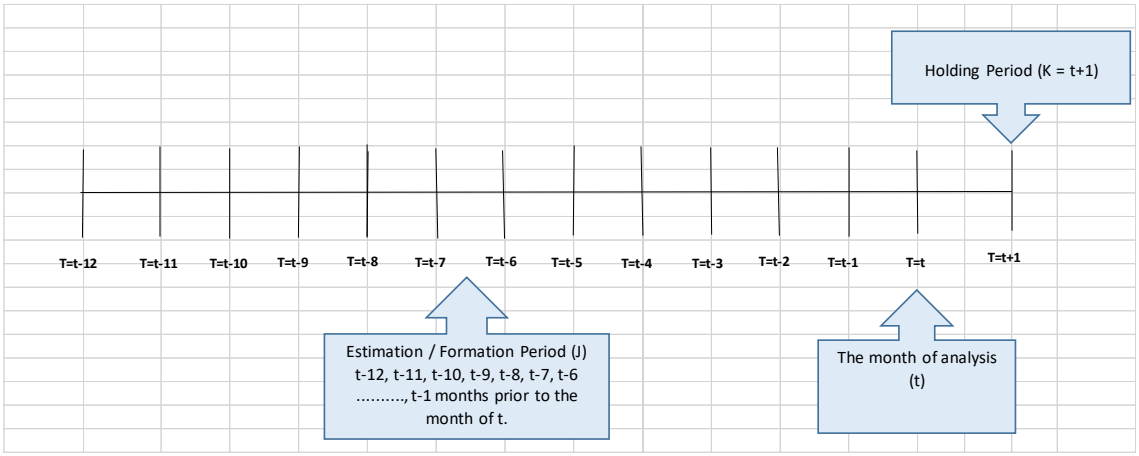

Figure 3.1: Portfolio formation and holding period

This study adopts the overlapping portfolio construction procedure of (Chen et al., 2016). The study utilizes monthly stock returns to construct the zero-investment loser and winner portfolios based on equally weighted and full rebalancing methods of portfolio formation. As shown in Figure 3.1, based on the past twelve-month cumulative average returns (CARs); the study sorts the overall stocks into winner and loser portfolios at the end of each month (t). The shares having the highest (lowest) CARs during the formation period t-12 to t-1 are categorized as winners (loser) portfolios as per Equation 3.2:

$$CAR = \sum_{t=-12}^{-1} AR_{it} \tag{3.2}$$

The winner portfolio contains the stocks with the prior 12-month CARs in the top 20%, while the loser portfolio comprises of the stocks with prior 12-month CARs in the bottom 20%. Following Asness (1994), the study forms contrarian strategy with a one-month delay between the formation and holding periods in order to mitigate microstructure issues such as bid-ask spread, trading cost and liquidity biases. After forming equally weighted winner and loser portfolios, the study then measures the returns of each portfolio for one month (t+1) holding period. By assuming the

contrarian strategy of longing the loser and shorting the winner with monthly rebalancing, the study computes the monthly payoffs (LMW) to contrarian strategy for each country, which is the difference in returns between the equally weighted winner ($Q_{W,t}$) and loser ($Q_{L,t}$) and portfolios over the holding period (t+1) month.

$$LMW_t = Q_{L,t} - Q_{W,t} > 0 \quad (3.3)$$

After calculating the monthly contrarian return series, the study then investigates the pattern of contrarian profits under changing market and volatility states to verify the existence of AMH. Following Wang and Xu (2015), the study defines market state as the return on value-weighted index for prior six months in each stock market at month t. For instance, a month is treated as in POSITIVE (NEGATIVE) state in cases where the prior six-month return on market index is positive (negative). In the same manner, a month is treated as in HIGH (LOW) volatility condition in cases where the prior six-month volatility of market index is larger (smaller) than the prior twelve-month index volatility. Given that the sample period of this study covers two major crises, such as the Asian financial crisis and global crisis and keeping in mind the possible effect of these crises' periods on contrarian returns, the study also examines the contrarian effect during these crises' periods.

To demonstrate the robustness of study results, the market state impact on time-varying contrarian payoffs in other major stock exchanges of the Asian region is also studied. The study uses monthly data on common stocks listed in some major emerging markets of Asia, retrieved from DataStream. These exchanges consist of Bursa Malaysia, Korea Stock Exchange (KRX), China's Shanghai Stock Exchange (SSE), Indonesia Stock Exchange (IDX), Stock Exchange of Thailand (SET) and Philippines Stock Exchange (PSE). The main stock market index of each selected country is utilized

as the proxy for market risk, which is further used to calculate the variables of market state and volatility for additional econometric analysis.

Table 3.1 reports the summary statistics for the yearly cumulative returns of the companies included in the dataset in each sample country over the full sample period from 1997 to 2018. The years with maximum cumulative returns for Indian and Pakistani companies in the dataset are 2001 and 2000. These years represent the periods of stock market scams for both the markets as the actions of some market brokers artificially inflated the stock prices through manipulative bubbles. The maximum cumulative return for Bangladeshi companies is evident from the year 2009-2011 when the stock market was facing a historic stock price boom. The minimum cumulative returns are observed in the year 2001 (-99.76%), 2004 (-39.68%) and 2009 (-37.33%), respectively for India, Pakistan, and Bangladesh. These were the periods when the markets were recovering from a stock market crash. Based on the companies used in the dataset, Indian companies have the highest median cumulative returns (26.54%), while the Pakistani companies exhibit the maximum mean cumulative returns (38.07%). The Bangladeshi companies show the lowest mean and median yearly cumulative profits of 22.45% and 15.50% during the overall sample period.

Table 3.1: Summary Statistics for the yearly cumulative returns for the whole data set

Year	India				Pakistan				Bangladesh			
	Min.	Max.	Median	Mean	Min.	Max.	Median	Mean	Min.	Max.	Median	Mean
1997	-181.96%	598.43%	-12.42%	-5.98%	-111.70%	610.00%	19.55%	29.46	-176.89%	1766.47%	-71.68%	-47.40%
1998	-146.12%	1363.33%	16.14%	61.26%	-150.00%	192.32%	-2.15%	2.04	-85.76%	173.63%	-11.85%	-7.10%
1999	-99.76%	8026.25%	127.73%	185.77%	-110.00%	708.36%	38.46%	51.50%	-65.79%	515.55%	-5.48%	1.91%
2000	-214.83%	1449.74%	-21.37%	-7.96%	-127.32%	1965.56%	40.31%	61.57%	-104.16%	132.07%	13.88%	16.36%
2001	-246.87%	17752.53%	-11.81%	22.60%	-132.97%	456.18%	18.95%	26.65%	-83.29%	145.82%	1.50%	6.83%
2002	-160.65%	993.53%	38.91%	63.29%	-111.80%	994.46%	67.77%	83.12%	-90.02%	289.38%	11.02%	17.89%
2003	-107.16%	2344.47%	106.51%	132.02%	-135.77%	1591.80%	71.16%	91.68%	-49.47%	83.99%	14.10%	13.84%
2004	-200.92%	2245.64%	84.91%	105.22%	-39.68%	1032.62%	72.00%	91.05%	-108.18%	182.00%	48.15%	49.25%
2005	-160.87%	1307.31%	64.70%	80.27%	-68.96%	578.87%	22.35%	29.01%	-101.88%	156.75%	-9.34%	-3.17%
2006	-245.81%	478.97%	10.87%	29.05%	-112.70%	219.75%	-5.33%	-1.12%	-83.05%	279.50%	-4.10%	2.33%
2007	-120.48%	740.57%	85.28%	104.80%	-57.76%	349.09%	42.35%	48.98%	-48.87%	377.31%	60.24%	68.14%
2008	-235.33%	377.82%	-80.84%	-70.10%	-174.70%	242.21%	-34.28%	-32.55%	-117.50%	447.35%	41.63%	49.85%
2009	-187.14%	1256.23%	76.51%	83.01%	-159.93%	8367.94%	18.83%	53.46%	-37.33%	1671.82%	82.04%	102.86%
2010	-153.25%	453.43%	21.84%	31.82%	-142.79%	558.07%	14.81%	28.28%	-76.55%	1070.35%	82.85%	89.41%
2011	-259.85%	364.27%	-26.96%	-22.80%	-172.16%	1094.55%	-8.59%	-0.14%	-132.67%	3128.91%	-36.81%	-23.65%
2012	-205.94%	417.50%	13.75%	23.11%	-93.95%	777.89%	74.96%	104.48%	-76.31%	132.59%	-6.49%	-4.81%
2013	-222.71%	1050.71%	-5.51%	2.56%	-57.64%	344.33%	52.33%	57.18%	-79.50%	244.61%	9.73%	18.77%
2014	-339.95%	9214.08%	52.55%	66.94%	-83.21%	679.17%	31.76%	40.86%	-73.58%	273.45%	0.18%	5.65%
2015	-351.24%	474.17%	22.22%	29.97%	-88.99%	304.18%	14.95%	24.96%	-57.26%	146.30%	-5.77%	-0.83%
2016	-278.28%	732.55%	9.37%	15.09%	-90.33%	456.96%	44.43%	58.18%	-59.16%	517.68%	13.21%	20.40%
2017	-264.98%	307.02%	28.30%	31.97%	-152.59%	484.42%	-20.24%	-12.82%	-78.94%	188.70%	25.56%	31.87%
2018	-272.63%	447.06%	-16.73%	-14.43%	-133.89%	425.13%	-3.52%	1.70%	-103.59%	320.93%	-14.96%	-4.08%
1997-2018	-211.67%	2381.62%	26.54%	43.07%	-114.04%	1019.72%	25.95%	179.82%	-85.90%	556.60%	10.80%	18.38%

Notes: This table provides the yearly minimum, maximum, median and mean returns of each country, computed with the annual cumulative returns of all the companies in the sample. The study period extends from 1997 to 2018.

3.2.1 Contrarian effect and the time-varying risk-premium relation

As suggested by Lo (2004), preferences, the relative size of various traders and certain other factors, such as tax laws, regulatory environment, lead to unstable risk-premium relationships. In this part of the study, along with testing the contrarian effect, the study aims to investigate whether there exists an unstable relationship between risk and reward within the contrarian anomaly framework. Particularly, from contrarian anomaly perspective, the fluctuations in risk-adjusted profits of contrarian portfolios and the time-varying factor loadings on various factors of risk may justify the unstable risk-reward relationship.

To attain the risk-adjusted contrarian profits (α values), the study employs the Capital Asset Pricing Model (CAPM) and Fama and French three-factor model (FFTM), as defined by Equations 3.4 and 3.5. Where LMW_t represents the returns on contrarian portfolio at month t, while R_{MKT}, R_{SMB} and R_{HML} respectively denote the market, size and value factors from Fama and French (1993). The market factor (R_{MKT}) is generated by deducting the risk-free rate from the return of market. To form the SMB and HML factors, the stocks are classified into two market capitalization groups and three book-to-market equity (B/M) ratio at the end of each period t. Bottom 10% of the stocks form the Small stocks, while top 10% stocks form the Big stocks. Similarly, top and bottom 30% stocks with respect to B/M ratio for big stocks form the High and low B/M value groups, respectively. SMB (Small Minus Big) represents the average difference in return between small and big stock portfolio. Whereas HML (High Minus Low) denote the average difference in return between the high and low value groups of stocks.

$$LMW_t = \alpha + \beta_{MKT} R_{MKT,t} + \varepsilon_t, \qquad \varepsilon_t \sim N(0, \sigma_\varepsilon^2) \tag{3.4}$$

$$LMW_t = \alpha + \beta_{MKT} R_{MKT,t} + \beta_{SMB} R_{SMB,t} + \beta_{HML} R_{HML,t} + \varepsilon_t, \quad \varepsilon_t \sim N(0, \sigma_\varepsilon^2) \tag{3.5}$$

3.3 Empirical Results and Discussion

3.3.1 Profitability of the contrarian strategy

Before investigating the risk and reward relationship, the preliminary findings of research confirm a statistically significant contrarian effect in all the sample emerging markets. Table 3.2 provides the excess returns to the winners, losers and contrarian portfolios during the entire study period (January 1997 - December 2018), while Table 3.3 reports the results during crises periods (January 1998 – December 1999 and October 2007 – September 2009). Mean raw and risk-adjusted (CAPM-based) contrarian returns are provided in percentage form. As shown in Table 3.2, both mean raw and risk-adjusted returns are positive for all the sample countries, with the highest raw (risk-adjusted) contrarian returns in India with 3.30% (3.07%) and lowest in Bangladesh with 0.20% (0.06%). Both raw and risk-adjusted returns are significant for India and Pakistan. The study associates the higher contrarian returns in Indian stock market with overreaction phenomenon. While comparing the returns of winners and loser portfolios in the Indian stock market in Table 3.2 and Table 3.3, the study observes that both winner and loser portfolios generate positive returns. However, neglected stocks that were possibly underpriced during the negative market state or crisis periods outperform winner portfolios in subsequent period when the market adjusts the prices of underpriced stocks. These results are consistent with Locke and Gupta (2009), who find almost similar contrarian returns around 3% in Bombay stock exchange and they associate these results with overreaction phenomenon in the Indian stock market. However, this thesis refines the interpretation of higher returns by incorporating the impact of changing market states on contrarian effect. Moreover, the impact of different investor behavior and investor sentiments cannot be ignored, rather further investigation can be made on this important issue.

Interestingly, the contrarian strategies yield significantly higher profits during crises periods, twice or even more as compared to non-crises periods. Table 3.3 provides the returns during the crises periods, where the highest mean (risk-adjusted) return is again in India with 4.62% (4.48%) and lowest in Bangladesh with 0.63% (0.25%). The raw (risk-adjusted) profits are significant for all the countries during crises periods. These results support the Hypothesis 1c of the thesis that contrarian returns are higher during crisis periods. It is also apparent that contrarian portfolios show varying performance patterns over time. In the next section, the study will conduct further investigation on this issue.

Table 3.2: Profitability of the contrarian strategy

Full sample (January 1, 1997-December 31, 2018)

Country		Winner	Loser	Contrarian (LMW)
India	Mean return	2.199***	5.505***	**3.306*** **
		(3.17)	(6.59)	**(5.02)**
	Risk-adjusted return	1.264*	4.511***	**3.076*** **
		(1.94)	(4.82)	**(3.56)**
Pakistan	Mean return	3.960***	4.907***	**0.947*** **
		(5.56)	(7.63)	**(3.59)**
	Risk-adjusted return	2.874***	3.556***	**0.510*** **
		(4.76)	(6.28)	**(2.70)**
Bangladesh	Mean return	2.261***	2.462***	**0.200**
		(3.31)	(3.59)	**(0.29)**
	Risk-adjusted return	2.196***	2.430	**0.063**
		(2.78)	(2.71)	**(0.10)**

Notes: This table provides the findings of country-specific contrarian profits over the whole sample period (from January 1997 to December 2018). At the end of every month (t), the stocks are classified into winners and losers portfolios based on past 12-month cumulative returns. The stocks having positive (negative) prior returns during the formation period t-12 to t-1 are categorized as winner and loser stocks. Contrarian profits represent the subsequent returns at (t+1) month holding period, calculated as the difference in return between the equally weighted loser and winner portfolio (LMW). CAPM-alpha denotes the Risk-adjusted returns. In parentheses are the values of robust t-statistic that are adjusted for heteroskedasticity, and autocorrelation based on Newey (1987). *, ** and *** denote the significance level at 10, 5 and 1 percent, respectively.

Table 3.3: Contrarian returns during crisis periods

Crisis Periods (Jan. 1998 – Dec. 1999 and Oct. 2007 – Sep. 2009)				
Country		**Winner**	**Loser**	**Contrarian (LMW)**
India	Mean return	5.021***	9.522***	**4.624*** **
		(2.76)	(4.80)	**(3.15)**
	Risk-adjusted return	4.433***	9.194***	**4.481*** **
		(2.88)	(5.43)	**(2.93)**
Pakistan	Mean return	1.504***	4.489***	**2.810*** **
		(3.06)	(5.38)	**(3.76)**
	Risk-adjusted return	1.948**	4.188***	**1.959***
		(2.24)	(4.93)	**(1.69)**
Bangladesh	Mean return	2.977***	3.045***	**0.633*** **
		(5.99)	(5.77)	**(3.85)**
	Risk-adjusted return	2.74**	2.994**	**0.254***
		(2.49)	(2.34)	**(1.72)**

Notes: This table provides country-specific contrarian strategy returns during crisis periods, consisting of 48 months. At the end of every month (t), the stocks are classified into winners and losers portfolios based on past 12-month cumulative returns. The stocks having positive (negative) prior returns during the formation period t-12 to t-1 are categorized as winner and loser stocks. Contrarian profits represent the subsequent returns at (t+1) month holding period, calculated as the difference in return between the equally weighted loser and winner portfolio (LMW). CAPM-alpha denotes the risk-adjusted returns. In parentheses are the values of robust t-statistic that are adjusted for heteroskedasticity, and autocorrelation based on Newey (1987). *, ** and *** denote the significance level at 10, 5 and 1 percent, respectively.

The study next turns to investigate the risk-reward relationship by evaluating the performances of contrarian portfolios under the CAPM and FFTM. Table 3.4 reports the findings for different countries over the whole sample period 1997-2018. The slopes of regression β_{MKT}, β_{SMB} and β_{HML} represent the corresponding loadings on the market (R_{MKT}), size (R_{SMB}) and value (R_{HML}) factors. The study first analyzes the findings based on CAPM model. As reported in Table 3.4, the risk-adjusted profits (α values) of contrarian portfolios are only marginally reduced compared to the raw returns over the entire sample period in Table 3.2. The addition of the market risk factor (RMKT) does not significantly reduce the contrarian returns. Moreover, risk-adjusted contrarian profits are positive in all the countries but significant only for India and Pakistan. However, the loadings on market risk factor are significant only for Pakistan. In general, the CAPM lacks the power to interpret the profits of contrarian portfolios.

Table 3.4: Adjusted returns under CAPM and Fama-French three-factor model

Country	CAPM		Fama-French three-factor model			
	α	β_{MKT}	α	β_{MKT}	β_{SMB}	β_{HML}
India	**3.076*** (3.56)**	0.061 (0.35)	**2.629*** (3.32)**	0.054 (0.41)	-0.040 (-0.08)	**0.59* (1.71)**
Pakistan	**0.510*** (2.70)**	**0.184** (2.12)**	0.278 (0.52)	**0.174** (1.98)**	-0.090 (-0.20)	0.318 (1.25)
Bangladesh	0.063 (0.10)	-0.055 (-0.45)	-0.236 (-0.40)	-0.034 (-0.25)	0.288 (0.72)	0.385 (1.03)

Notes: This table provides the risk-adjusted profits of contrarian portfolios (α value) obtained from CAPM and Fama-French three-factor model. It also provides factor loadings of various factors of risk (e.g., β_{MKT}, β_{SMB}, β_{HML}). The values of robust t-statistic are in parentheses that are adjusted for heteroskedasticity and autocorrelation on the basis of Newey (1987). *, ** and *** denote the significance level at 10, 5 and 1 percent, respectively.

The study next moves to check the results of the FFTM. The risk-adjusted profits under the FFTM are considerably lower for all the countries. They become statistically insignificant for Pakistan and Bangladesh, indicating that the FFTM has a strong power in explaining the contrarian effect compared to the CAPM. Overall, the market risk factor loadings (β_{MKT}) are positive and significant for Pakistan, while the value factor loadings (β_{HML}) are positive for India. For Bangladesh, the risk-adjusted profits and the factor loadings (β_{MKT}) of the market risk factor are negative but insignificant. The results of the FFTM are mixed. Insignificant and significant risk-adjusted contrarian profits are obtained across countries. Moreover, the magnitude of raw and risk-adjusted returns differs during crisis periods (as shown in Table 3.3). These findings, consistent with AMH (Lo, 2004), imply that there is possibly the time-varying risk-reward relationship in the form of contrarian effect in South Asian emerging markets.

The findings of current study also raise questions on the standard procedures used in several prior studies, where constant factor loadings are applied for various risk factors

by applying time-series regression throughout the whole study period (Liew & Vassalou, 2000; Subrahmanyam, 2010; Fama & French, 2012, 2017). The results may be misleading if factor loading dynamics are not incorporated in traditional risk-adjustment processes. Theoretically, factor loadings are certainly time-varying and depending on the formation frequency of contrarian or momentum portfolios, as suggested by Wang and Wu (2011). As per the authors, individual stock returns are produced through FFTM with constant factor loadings, but the monthly formation of contrarian portfolios applied in most of the studies require different loser and winner stocks each month. While the factor loadings on various risk components for contrarian portfolios are average loadings of individual stocks in the sample, thus resulting in risk factor loadings that fluctuate over time. Moreover, it is natural that loser (winner) portfolios are formed with those stocks that have generally lower (higher) risk factor loadings if the premium on risk factors show positive profits, whereas stocks with higher (lower) risk factor loadings are chosen for the loser (winner) stocks in case the premium has negative profits. Therefore, the loadings on various risk factors will co-vary with respective premium of risk factors in a time-varying nature.

3.3.2 Impact of changing market conditions on contrarian payoffs

In order to examine the hypothesis originated from AMH that the varying stock market conditions are the primary reasons of time-dependent market efficiency, this study moves to investigate the behavior of contrarian profits in changing market states (POSITIVE/NEGATIVE) with volatility (HIGH/LOW) clustering within each state of the market. The market state (or direction) plays a crucial role in momentum (contrarian) profitability (Cooper et al., 2004). To achieve this goal, the study splits the overall sample period in four groups based on market state and volatility pairs. As previously stated, a month is considered to be in a POSITIVE (NEGATIVE) market condition if the prior six-month return on market index is positive (negative). Every

market state is further subdivided into HIGH (LOW) volatility subgroups. A month is treated as in HIGH (LOW) volatility condition in cases where the prior six-month volatility of market index is larger (smaller) than the prior twelve-month index volatility.

The analysis regarding contrarian payoffs reported in Table 3.5 advocates that both market state and volatility factors are important in explaining contrarian profitability. The higher mean raw and risk-adjusted contrarian returns are obtained in negative market state with higher market volatility. Moreover, the mean return spread between the negative and positive market states with higher market volatility is as high as 6.78% (6.958-0.175), 5.309% [3.607- (-1.432)] and 3.837% (7.298-3.461) for Pakistan, Bangladesh, and India, respectively. The mean and risk-adjusted returns of negative (high volatility) states are both economically and statistically significant compared to other market states. Furthermore, we can see a more pronounced effect of market state (POSITIVE/NEGATIVE) that all the combinations in the negative market state consistently outperform their counterparts in the positive market state.

However, the volatility effect is found to be slightly less pronounced and asymmetric within each market state (POSITIVE/NEGATIVE) as in one exception under the positive market state of BSE, the lower volatility months generate higher contrarian returns than higher volatility months by 1.312% (4.773-3.461) and 1.46% (4.52-3.06) after risk-adjustment. Apart from this deviation, all the markets show a consistent pattern that the months with higher volatility outperform the months in lower volatility in each market state. The less pronounced volatility impact across each market state indicates the more dominant role of market state than market volatility in the predictability of contrarian strategy payoffs in selected emerging markets.

Table 3.5: Market State, Volatility and Contrarian Strategy Payoffs

	POSITIVE Market State		NEGATIVE Market State	
	High Volatility	Low Volatility	High Volatility	Low Volatility
India				
Mean return	**3.461*** **	***4.773*** **	**7.298*** **	7.283*** **
	(3.39)	*(3.63)*	**(2.97)**	(4.22)
Risk-Adjusted return	**3.06*** **	***4.52*** **	**8.166*** **	6.419*** **
	(3.05)	*(3.55)*	**(2.7)**	(4.35)
No. of months	85	*95*	29	55
Pakistan				
Mean return	0.175	0.143	**6.958** **	1.322
	(0.23)	(0.09)	**(2.3)**	(1.52)
Risk-Adjusted return	0.114	0.015	**4.955** **	1.462*
	(0.15)	(0.02)	**(2.23)**	(1.7)
No. of months	80	118	24	42
Bangladesh				
Mean return	-1.432	-1.425*	**3.607** **	-0.685
	(-1.48)	(-1.76)	**(2.04)**	(-0.69)
Risk-Adjusted return	-1.400	-1.798**	**2.875** **	-0.792
	(-1.46)	(-2.26)	**(2.15)**	(-0.79)
No. of months	53	79	35	49

Notes: This table report the effect of changing market conditions on contrarian payoffs. At the end of every month (t), the stocks are classified into winners and losers' portfolios based on past 12-month cumulative returns. The stocks having positive (negative) prior returns during the formation period t-12 to t-1 are categorized as winner and loser stocks. Contrarian profits represent the subsequent returns at (t+1) month holding period, calculated as the difference in return between the equally weighted loser and winner portfolio (LMW). A month is treated as in POSITIVE (NEGATIVE) state in cases where the prior six-month return on market index is positive (negative). A month is treated as in HIGH (LOW) volatility condition in cases where the prior six-month volatility of market index is larger (smaller) than the prior twelve-month index volatility. CAPM-alpha denotes the risk-adjusted returns. In parentheses are the values of robust t-statistic that are adjusted for heteroskedasticity, and autocorrelation based on Newey (1987). *, ** and *** denote the significance level at 10, 5 and 1 percent, respectively.

These findings contradict the results of the U.S equity market, where the volatility factor acts as the primary predictor of momentum strategy payoffs (Wang & Xu, 2015). This variation can be explained through the structural changes in return dynamics among developed and emerging equity markets. Overall, from the point of view of investors, we can suggest that higher profits can be achieved by making contrarian style portfolios in negative market state with higher market volatility. These results support the hypotheses H1a and H1b designed to achieve the objective one of the thesis.

The study gets more insights by examining the payoffs of loser and winner portfolios within the positive and negative market state. Table 3.6, Panels A and B provide the results of contrarian payoffs to loser and winner portfolios under negative and positive market states. The study finds that higher contrarian returns are primarily associated with the outperformance of loser portfolios, particularly during negative market states. Following the negative market state, the loser portfolios generate significantly higher mean raw (risk-adjusted) returns of 8.43% (7.69%), 5.42% (4.47%), and 4.32% (4.19%), respectively for India, Pakistan and Bangladesh. The same trend was observed during crisis periods (in Table 3.3) that the higher ex-ante expected returns of contrarian strategy during crises periods were mainly due to the higher payoffs attached to the past loser (neglected) stocks. These results comply with the latest findings of Daniel and Moskowitz (2016), who state that, specifically in panic and higher volatility states, the momentum investment strategy crashes which is contemporaneous with stock market rebounds.

In contradiction with the results during negative market states, as expected, winner portfolios yield higher returns during the positive market state in Bangladeshi and Pakistani stock market. These results are consistent with self-attribution bias and overconfidence hypothesis of Daniel, Hirshleifer, and Subrahmanyam (1998), who claim that Investors have a self-attribution bias, which means they associate their success on their own abilities and blame their loss on other factors. This enhanced overconfidence amplifies the original overreaction, resulting in higher momentum returns for a shorter period. However, when investors observe the true market position and recognize their errors, the stock price overreaction gradually corrects itself in the subsequent period. The results of Indian stock market are inconsistent with the above assumption where loser portfolios again beat their winner counterparts in positive market state. This could be due to the higher level of contrarian returns in both normal

and crisis periods in this market, which leads to higher loser portfolios returns during negative as well as positive market states.

In panel C of Table 3.6, the study examines the hypothesis of equality of returns between negative and positive market states. In most of the cases, the null hypothesis of the equality of returns between different market states is rejected as the results are significant at 10, 5 and 1 percent significance levels. These results indicate that the returns of positive and negative market state are significantly different from zero, so the market state impact on winners, losers and contrarian portfolios cannot be neglected. The overall results show that returns on winner portfolios are lower in bearish market conditions than in bullish market conditions. On the other hand, the results for loser portfolios show more persistent and statistically significant distinction between the different market states, indicating that the influence of the market state on contrarian payoffs is largely derived from its impact on short-term contrarian profitability of loser portfolios.

Table 3.6: Market states and the payoffs to winner and loser portfolios

Panel	India		Pakistan		Bangladesh	
	Winner	**Loser**	**Winner**	**Loser**	**Winner**	**Loser**
Panel A: Average Monthly Returns during POSITIVE Market State						
Mean return	3.460***	7.614***	5.263***	4.402***	3.935***	2.507***
	(3.57)	(6.35)	(6.05)	(7.6)	(5.94)	(4.12)
Risk-Adjusted return	2.236***	6.244***	3.462***	3.771***	3.618***	2.151***
	(2.65)	(5.92)	(5.82)	(6.56)	(5.22)	(3.53)
No. of months	180	180	198	198	132	132
Panel B: Average Monthly Returns during NEGATIVE Market State						
Mean return	1.142	**8.431*****	0.053	**5.425****	0.219	**4.322****
	(1.12)	**(3.51)**	(0.052)	**(2.39)**	(0.18)	**(2.39)**
Risk-Adjusted return	0.724	**7.693*****	-0.038	**4.475*****	0.177	**4.198****
	(0.88)	**(3.96)**	(-0.75)	**(4.00)**	(0.16)	**(2.45)**
No. of months	84	84	66	66	84	84
Panel C: Equality of returns test (H0: POSITIVE-NEGATIVE=0)						
Mean return	(1.72)*	(1.70)*	(3.91)***	(2.57)**	(3.40)***	(1.27)
Risk-Adjusted return	(1.82)*	(1.94)*	(3.70)***	(2.53)**	(3.34)***	(1.30)

Notes: This table presents the payoffs of loser and winner portfolios under POSITIVE and NEGATIVE market states. At the end of every month (t), the stocks are classified into winners and losers portfolios based on past 12-month cumulative returns. The stocks having positive (negative) prior returns during the formation period t-12 to t-1 are categorized as winner and loser stocks. Contrarian profits represent the subsequent returns at (t+1) month holding period, calculated as the difference in return between the equally weighted loser and winner portfolio (LMW). A month is treated as in POSITIVE (NEGATIVE) state in cases where the prior six-month return on market index is positive (negative). Panel A reports the returns of winner and loser portfolios following positive market state, while Panel B reports the returns of winner and loser portfolios following negative market state. CAPM-alpha denotes the risk-adjusted returns. Panel C presents the values of robust t-statistics estimated to examine the hypothesis of the equality of returns between negative and positive market conditions. In parentheses are the values of robust t-statistic that are adjusted for heteroskedasticity, and autocorrelation based on Newey (1987). *, ** and *** denote the significance level at 10, 5 and 1 percent, respectively.

Furthermore, Groot et al. (2012) and Blitz et al. (2011) report the similar reversal effects during crisis periods while testing the various stock selection strategies on emerging and developed markets. The possible interpretation for higher contrarian returns during the down-market state or crash period could be that investors search for safe heavens during these times and shift their positions to those winner (quality) stocks that hold higher credit rating. In comparison, the prevalent pessimism against loser stocks pushes their values too low, exaggerating their risk and reducing the probability of gains for those stocks. Subsequently, as the economy recovers and adjusts the prices of underpriced and overpriced shares, the loser stocks then outperform. Hence, the investment strategy of buying the depressed stocks at low price and selling them when they regain yields substantial future profits.

The time-varying nature of contrarian payoffs during different market states can also be observed in Figs. 3.2, 3.3 and 3.4, respectively, for Pakistan, Bombay and Dhaka stock exchanges. We can see the hikes in contrarian strategy profits during negative states in Pakistan stock exchange, specifically during the Asian financial crisis over January 1998 to December 1999, then at the start of 2001 to 2002 and later in the times of global crisis, where there are considerable positive hikes in contrarian strategy payoffs. Similar patterns of higher contrarian returns can be seen in the Indian stock market during the Asian financial crisis and after the global crisis. The same trend is present during the stock market crash of the Bombay stock exchange from the beginning of 2001 till the end of 2002. This period was one of the worst periods for the Indian stock market when the actions of some stock market brokers caused the whole market to crash by 21% in March 2001 (Uppal & Mangla, 2006). Finally, the hikes in contrarian payoffs in the Bangladeshi stock market can be found at the end of the global financial crisis in 2009, then from the beginning of 2011 till mid-2013, representing a period of Bangladeshi share market scam which exacerbated due to government failure.

The market fell by 10% in January 2011 and then further 30% in February 2011 (Choudhury, 2013). The findings of this section provide ample support to the argument that the performance of stock market anomalies evolve over time; therefore, the AMH should be taken into account when explaining the behavior of such market anomalies.

The study then conducts a similar analysis for six other major emerging markets of the Asian region for the robustness of the study results. The findings are reported in Figure 3.5. For the Malaysian stock market, the contrarian effect strengthens from 1997-1998, possibly during the Asian Financial Crisis, spikes again during the year 2001, disappears from 2006-2008 and appears again from the mid of 2008-2009 during the downturn of the stock market. Similar peaks in contrarian payoffs during the negative market states can be found in Korea Stock Exchange from 1997-1998, during the year 2001, then in 2003 and finally during the global crisis from September 2008 to August 2009. For Chinese equity market, we see a combination of momentum and contrarian effects from 1997-1998, strong momentum effect from 1999-2000, strong contrarian effects during the market crash from 2008-2009 and finally, during the negative market state in 2016. For other major stock markets of the region, the study also witnesses the wax and wane in the contrarian effects across market states.

Table 3.7 provides the summarized results in tabular form regarding the market state and contrarian profitability nexus in the context of other major emerging markets of the Asian region. Apart from China where contrarian returns are higher in both positive and negative market states, all the combinations of contrarian strategies yield significantly positive and higher returns during negative market states in all the countries. These results generalize the prior study findings based on the investigation in other emerging economies of the region.

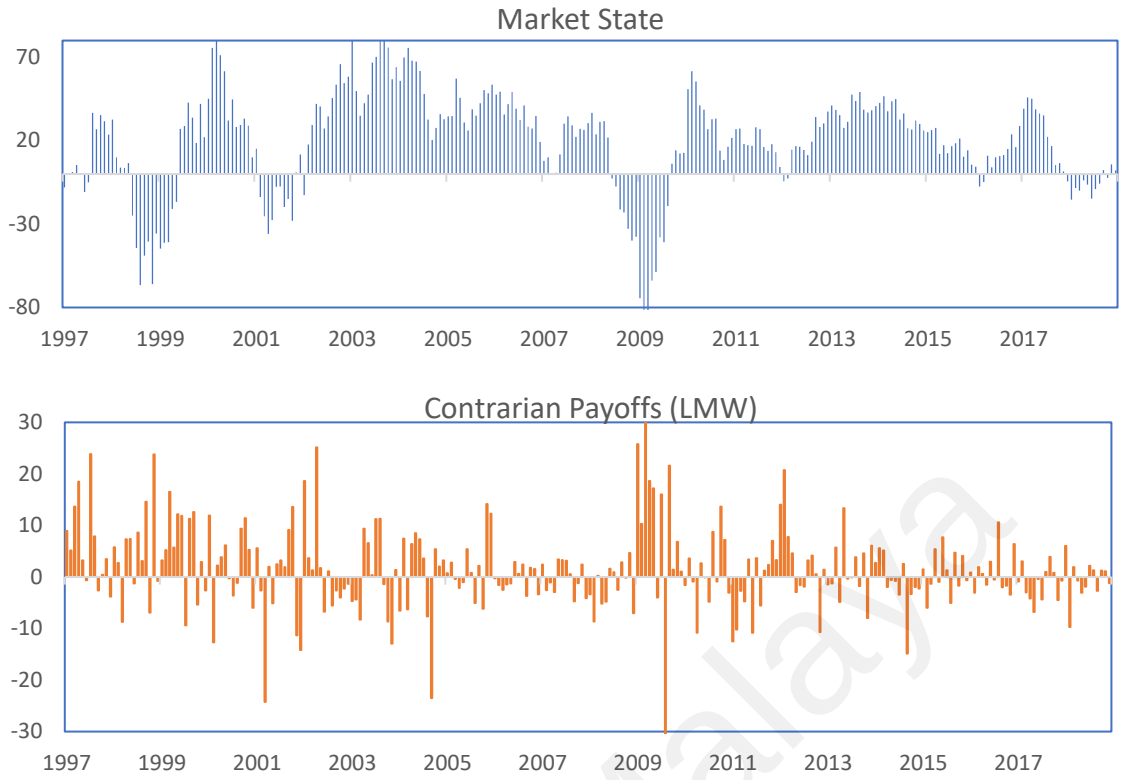

Figure 3.2: Market State and Contrarian payoffs (LMW) in Pakistan

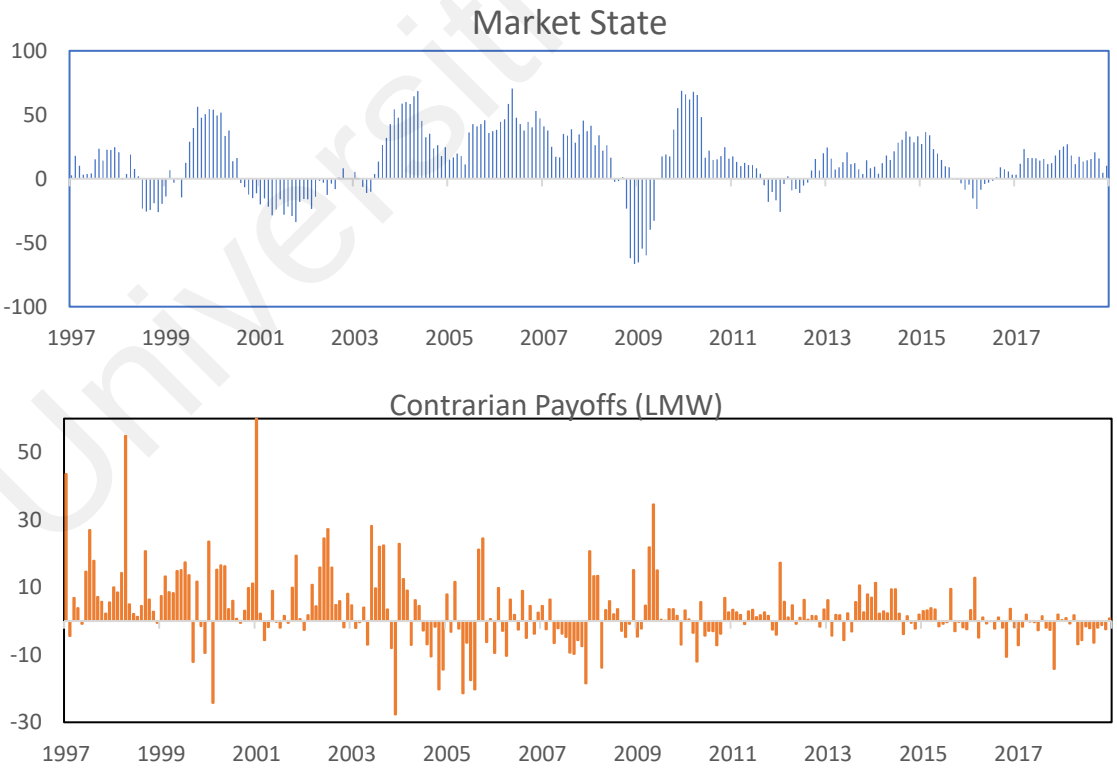

Figure 3.3: Market State and Contrarian payoffs (LMW) in India

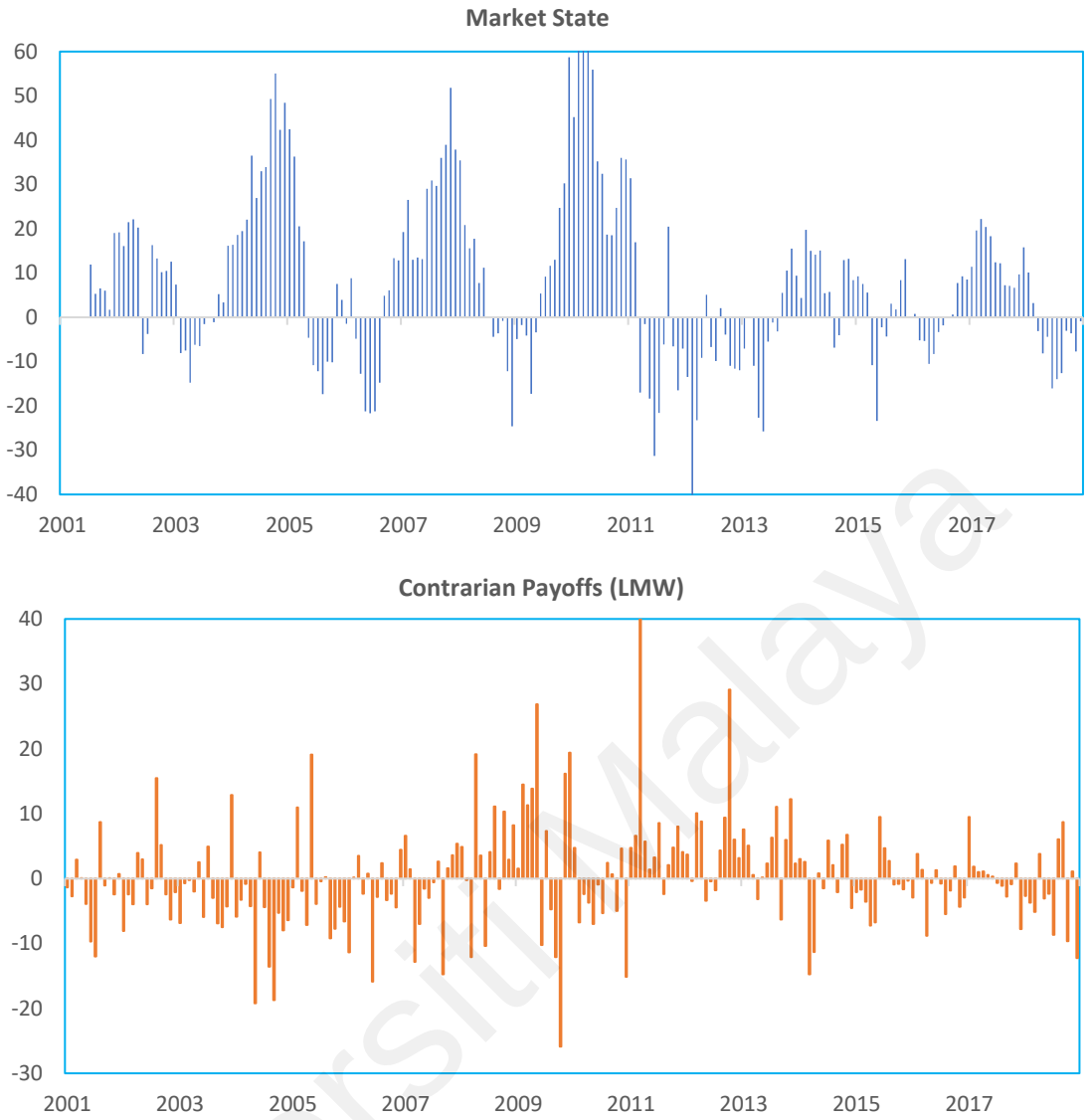

Figure 3.4: Market State and Contrarian payoffs (LMW) in Bangladesh

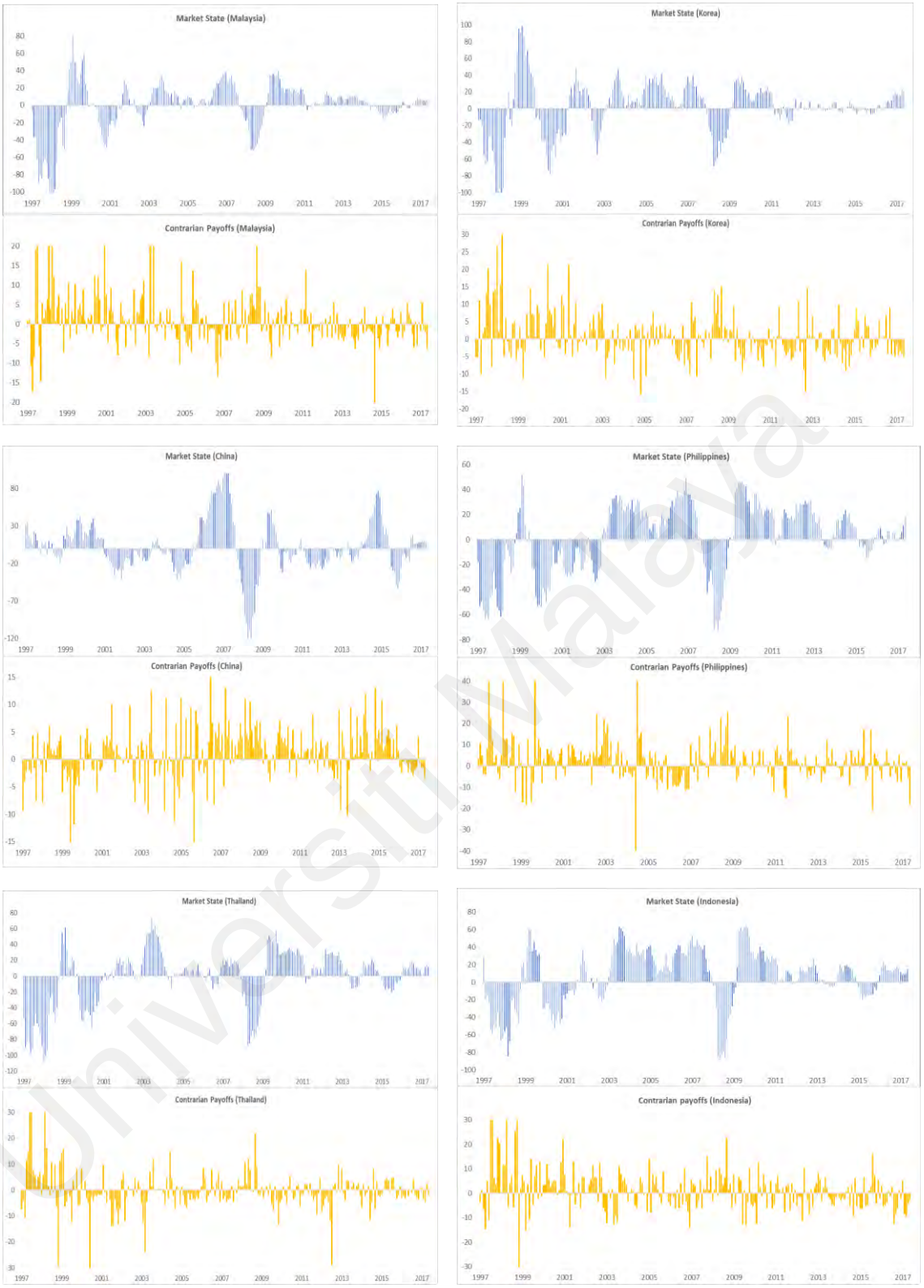

Figure 3.5: Market state and time-variation in contrarian payoffs in other major emerging markets

This figure depicts the time-varying behavior of contrarian payoffs under changing market states for 6 major emerging markets of Asian region: Malaysia, Korea, China, Philippines, Thailand and Indonesia. The market state is defined as the return on value-weighted index of each market over the past twelve-month. Contrarian profits represent the subsequent returns at (t+1) month holding period, calculated as the difference in return between the loser and winner portfolios (LMW).

Table 3.7: Market State and Contrarian effect in other major emerging markets

	POSITIVE Market State			NEGATIVE Market State		
	L12-Month	**L24-Month**	**L36-Month**	**L12-Month**	**L24-Month**	**L36-Month**
China	0.554	1.138**	1.117***	**1.313*****	0.765*	0.713
	(1.10)	(2.52)	(2.82)	(3.42)	(1.74)	(1.38)
Indonesia	-0.559	-0.197	-0.579	**5.789*****	4.885***	6.395***
	(-1.04)	(-0.41)	(-1.29)	(3.59)	(2.98)	(3.51)
Korea	-0.694	-0.644	-0.784	**3.109*****	2.728***	3.085***
	(-1.60)	(-1.45)	(-1.78)	(3.09)	(2.89)	(3.18)
Malaysia	0.869	1.011	0.719	**2.670****	**2.538****	**2.914*****
	(0.84)	(0.92)	(0.63)	(2.21)	(2.38)	(2.97)
Philippines	0.093	0.324	0.385	**6.755*****	6.681***	6.176***
	(0.13)	(0.47)	(0.54)	(3.57)	(3.36)	(3.29)
Thailand	-1.95***	-1.141**	-0.948**	**3.217****	1.642	1.320
	(-3.88)	(-2.50)	(-2.09)	(2.48)	(1.29)	(1.06)

Notes - This table report the summarized findings relating to the effect of changing market conditions on contrarian payoffs in some other emerging markets of the Asian region. The sample countries include China, Indonesia, Korea, Malaysia, Philippines and Thailand. At the end of every month (t), the stocks are classified into winners and losers portfolios based on past 12-month cumulative average returns. The stocks having positive (negative) prior returns during the formation period t-12 to t-1 are categorized as winner and loser stocks. Contrarian profits represent the subsequent returns at (t+1) month holding period, calculated as the difference in return between the equally weighted loser and winner portfolio (LMW). The study utilizes the lag 12-, 24-, and 36-month proxies of market state. A month is treated as in POSITIVE (NEGATIVE) state in cases where the prior 12-, 24-, and 36-month return on market index is positive (negative) in each country. In parentheses are the values of robust t-statistic. *, ** and *** denote the significance level at 10, 5 and 1 percent, respectively.

3.3.3 Incorporating transaction costs

The findings reported in prior sections are based on market pricing without specifically taking into account transaction costs. As the liquidity in emerging markets is often weaker than the developed markets (see, Speidell & Krohne, 2007), so incorporating actual transaction costs such as bid-ask spread into prices will refine the

profitability of investment strategies in the presence of real life imperfections of stock markets. This section investigates the question whether the anomalous gains linked to contrarian investment strategies are actually inconsistent with the market efficiency hypothesis. The model of Keim and Madhavan (1997) is frequently used in past papers that explore the returns of market anomalies after accounting for trading costs in the US and other developed markets (see, Avramov et al., 2006). In the context of emerging and frontier equity markets, the model of Marshall et al. (2011) and Groot et al. (2012) is applied that incorporates the characteristics of emerging markets. Therefore, the study applies the model of Marshall et al. (2011) and Groot et al. (2012) and considers bid-ask spread as transaction costs. The study gathers the required data from Thomson and Reuters Datastream. To control the effect of bid-ask bounce and other relevant costs, consistent with the prior studies, the study skips one month period between the portfolio formation and holding periods.

The results reported in Appendix A incorporate transaction costs in the contrarian investment strategies. Table A.1 provide the profitability of contrarian investment strategy during the whole sample period, while Table A.2 reports results during crisis periods. The impact of market state and volatility factors on transaction cost adjusted contrarian returns are shown in Table A.3. The results are reported in the form of gross returns and net returns in all the Tables. Gross returns are the simple contrarian returns calculated as the difference between loser minus winner portfolios. Net returns are the transaction cost adjusted returns determined by subtracting the bid-ask spread as transaction cost from portfolio returns. As shown in Table A.1, although net returns are slightly lower in magnitude (for Bangladesh) and negative (for India and Pakistan) compared to gross returns during the whole sample period, but the contrarian returns are still positive and statistically significant during the crisis periods. For example, contrarian strategy yields 0.40%, 1.11%, and 0.41% monthly returns for India, Pakistan

and Bangladesh, respectively during crisis periods (see Table A.2). Table A.3 presents the impact of market state and volatility on contrarian strategy returns. The higher net contrarian returns are mainly obtained in negative market state with higher volatility. As reported in Table A.3, the net returns are still positive in magnitude for all countries during the periods of negative market state and higher market volatility. The net returns of negative (high volatility) states are both economically and statistically significant compared to other market states. Hence, we can conclude that net returns are somewhat lower in magnitude, but they are less likely to vanish owing to transaction costs. The overall results again support the hypotheses H_{1A}, H_{1B}, and H_{1C} that contrarian strategies generate higher returns during negative market state, higher volatility and crisis periods even when the transaction costs are accounted for.

3.3.4 Context-dependent contrarian effects - Evidence from augmented FFTM

To mitigate the impact of various risk factors, the study again runs the pricing model with the addition of market condition dummies to identify a more accurate relationship between contrarian profitability and stock market conditions (Kim et al., 2011; Taylor, 2014). This analysis also helps in testing the robustness of prior study findings. Specifically, the study employs the augmented FFTM, as shown in Equation 3.6. Where, LMW_t represents the contrarian portfolio returns at time t, while R_{MKT}, R_{SMB} and R_{HML} respectively denote the market, size and value factors from Fama & French (1993). D_t represents the dummy variable of specific market conditions, which takes the value one or zero at time t. The study employs various indicators of stock market conditions that are repeatedly used in existing literature (Umutlu, Akdeniz, et al., 2010; Taylor, 2014), such as market state, volatility and crisis periods (e.g., Asian crisis and global financial crisis).

$$\boldsymbol{LMW_t = \alpha + \beta_{MKT}R_{MKT,t} + \beta_{SMB}R_{SMB,t} + \beta_{HML}R_{HML,t} + \beta_D D_t + \varepsilon_t, \quad \varepsilon_t \sim N(0, \sigma_\varepsilon^2)} \qquad \textbf{(3.6)}$$

Market state dummy takes the value one (zero) if the past twelve month return on market index is negative (positive) at month t. Likewise, the market volatility dummy takes the value of one (zero) if the prior six-month market index volatility is higher (lower) than the prior twelve-month market index volatility at month t. The Asian financial crisis occurred between 1998-1999, its dummy variable receives the value one in the months from Jan. 1998 to Dec. 1999, while zero otherwise (see e.g., Umutlu et al., 2010 for prescribed length of Asian crisis period). The global crisis, which occurred between 2007-2009, its dummy variable takes the value of one in the months from Oct. 2007 to Sep. 2009, while zero otherwise.

Table 3.7 provides the findings of regression Equation 3.6. As per the findings in panel A based on market state, the risk-adjusted contrarian returns are positively

significant only for India but negatively insignificant for Pakistan and negatively significant for Bangladesh. Interestingly, the risk-adjusted returns of contrarian portfolios are lower than their corresponding raw returns in all the countries. Notably, there are positive and significant loadings on the dummy factor of market state, indicating the better performance of contrarian portfolios under the periods with negative trends of the market. Panel B provides the findings on the basis of market volatility. The risk-adjusted profits are again lower than their respective raw returns, significant only for the Indian stock market while insignificant and negative for Pakistani and Bangladeshi stock markets. Notably, there are positive but insignificant loadings on the dummy factor of market volatility for Pakistan and India, while negative and insignificant for the Bangladeshi stock market. In comparison, the larger and more significant factor loadings on market state dummies reveal the more dominant effect of market state instead of market volatility, which again supports the prior finding that the market state instead of market volatility is more likely the primary source of contrarian profitability in emerging stock markets.

Panels C and D provide the findings based on the periods of Asian financial Crisis and Global Crisis, respectively. For all the countries, loadings on Asian crisis dummies are highly positive and significant, indicating the strong impact of Asian crisis on contrarian strategy returns. However, the effect of global crisis on contrarian payoffs is unclear as the loadings on global crisis dummies are either small or negative and insignificant for all the sample countries. The large and significant coefficients of the Asian financial crisis dummies reveal its more dominant impact on the market efficiency of South Asian emerging markets compared to the global crisis.

Table 3.7: Context-dependent contrarian effects - Evidence from augmented FFTM

Country	Raw Return	α	β_{MKT}	β_{SMB}	β_{HML}	β_D
Panel A: Market State						
India	3.306***	1.413*	0.066	-0.019	0.567	**4.547****
	(5.02)	(1.73)	(0.40)	(-0.03)	(1.40)	**(2.09)**
Pakistan	0.947***	-0.139	0.173*	-0.112	0.278	**2.196**
	(3.59)	(-0.30)	(1.97)	(-0.25)	(1.07)	**(0.85)**
Bangladesh	0.200	-1.01*	0.129	0.598	-0.417	**2.331***
	(0.29)	(-1.81)	(0.99)	(1.40)	(-1.51)	**(1.73)**
Panel B: Market Volatility						
India	3.306***	2.594***	0.054	-0.041	0.590	**0.082**
	(5.02)	(2.63)	(0.32)	(-0.07)	(1.49)	**(0.05)**
Pakistan	0.947***	-0.142	0.171*	-0.071	0.317	**1.081**
	(3.59)	(-0.21)	(1.94)	(-0.16)	(1.27)	**(0.75)**
Bangladesh	0.200	-0.039	0.144	0.585	-0.419	**-0.467**
	(0.29)	(-0.04)	(1.05)	(1.38)	(-1.45)	**(-0.39)**
Panel C: Asian Crisis						
India	3.306***	1.958**	0.048	-0.065	0.688*	**6.620*****
	(5.02)	(2.30)	(0.29)	(-0.11)	(1.74)	**(2.71)**
Pakistan	0.947***	0.020	0.179**	-0.097	0.352	**2.470***
	(3.59)	(0.03)	(2.01)	(-0.21)	(1.35)	**(1.76)**
Bangladesh	0.200	-0.588	-0.042	0.269	0.437	**3.471***
	(0.29)	(-0.94)	(-0.31)	(0.66)	(1.11)	**(1.70)**
Panel D: Global Crisis						
India	3.306***	2.550***	0.055	-0.033	0.591	**0.867**
	(5.02)	(2.70)	(0.33)	(-0.06)	(1.50)	**(0.35)**
Pakistan	0.947***	0.288	0.174*	-0.091	0.318	**-0.110**
	(3.59)	(0.62)	(1.74)	(-0.19)	(1.25)	**(-0.02)**
Bangladesh	0.200	-0.184	-0.036	0.282	0.385	**-0.561**
	(0.29)	(-0.29)	(-0.26)	(0.70)	(1.03)	**(-0.40)**

Note: This table exhibits contrarian portfolio performance on the basis of three-factor model of Fama and French by including various dummies of stock market conditions, namely, $LMW_t = \alpha + \beta_{MKT}R_{MKT,t} + \beta_{SMB}R_{SMB,t} + \beta_{HML}R_{HML,t} + \beta_D D_t + \varepsilon_t$. For each market condition, the dummy variable D_t receives the value one or zero (as defined in the paper). Panel A through D report the findings on the basis of four specific market conditions. These market conditions include market state (positive/negative), volatility (high/low), Asian crisis period and global crisis period. In parentheses are the values of robust t-statistic that are adjusted for heteroskedasticity, and autocorrelation based on Newey (1987). *, ** and *** denote the significance level at 10, 5 and 1 percent, respectively.

These results comply with the findings of previous researches in developed markets. Kim et al. (2011) reveal that the return predictability of momentum investment strategies are higher during stock market bubbles as compared to normal market

conditions, while the stock market crashes are considered the worst times for momentum profits (Asness et al., 2015; Daniel & Moskowitz, 2016; Hao et al., 2018).

According to the overall study results based on various viewpoints, contrarian profitability is mainly dependent on varying conditions of the stock market. The periods with a negative state of the market, higher stock market volatility and the Asian financial crisis relate to higher contrarian profitability. The relationship between contrarian profitability and varying market conditions holds even after controlling for the effect of known risk factors.

3.4 Conclusion

In the existing literature of the efficient market hypothesis (EMH), technical anomalies like momentum and contrarian investment strategies are always considered tricky to be fully interpreted by the EMH. This study examines the impact of changed market conditions on time-series predictability of contrarian profitability in South Asian emerging markets, which is also considered the leading cause of time-dependent market efficiency as per the adaptive market hypothesis (AMH). In the empirical analysis, the study specifically focuses on the emerging markets of the South Asian region as the stock prices are mean reverting, returns are non-random, while the manipulative and speculative bubbles are persistent issues in these markets. The sample countries include India, Pakistan and Bangladesh.

The preliminary findings confirm that a strong and significant contrarian effect holds in all the selected South Asian emerging markets. The results based on CAPM and three-factor Fama and French model demonstrate the time-varying nature of risk-adjusted returns, while the loadings of various factors of risk are non-constant. These findings are consistent with AMH. The study then investigates the relationship between contrarian payoffs and stock market conditions. The findings reveal that contrarian

returns strengthen during negative market state, higher market volatility and crises periods, particularly during the Asian financial crisis. In line with the results of Wang and Xu (2015), the research confirms the presence of a significantly negative relationship between market state and a positive association of stock market volatility with contrarian payoffs. However, in contradiction with their findings, the market state factor instead of market volatility, serves as a primary source of contrarian payoffs in selected emerging markets. According to the overall study results based on various viewpoints, contrarian profits are highly dependent upon changing stock market conditions. The relationship between contrarian profitability and varying market conditions holds even after controlling for the effect of known risk factors.

The overall empirical results of this study offer partial support to AMH, which considers the changing market conditions as the primary reasons of time-dependent market efficiency in the shape of higher returns of stock market anomalies. However, another significant result of this research implies that investors in South Asian emerging markets, like investors in the developed markets, could not respond to evolving market conditions. Therefore, contrarian return opportunities frequently arise over time, and persistent weak-form market inefficiencies exist in these markets. The findings provide alternative evaluation matrices to investors and fund managers by suggesting that a contrarian strategy generally outperforms in South Asian emerging markets, could be employed particularly during negative market states, higher volatilities and crisis periods in order to generate higher returns.

CHAPTER 4: FIRM-SPECIFIC, INDUSTRY-SPECIFIC AND MACROECONOMIC FACTORS OF CONTRARIAN STRATEGY'S PROFITABILITY IN SOUTH ASIAN STOCK MARKETS

4.1 Introduction

Momentum investing is a trading tool that investors use to maximize their profitability in stock markets. Investors take frequent long position in stocks that show an upward pricing trend and short the stocks with a downward pricing trend. On the other hand, contrarian investors buck against the existing market trend by buying the stocks or other assets that show the downward pricing trend and selling the stocks with upward pricing pattern. Jegadeesh and Titman (1993) is the pioneer who tested momentum strategy in the US stock market and reported an annual average return of 12.01%. Since then, several studies examined the momentum and contrarian effect in US and several other markets. Prior research has demonstrated that momentum impact is mostly dominant in developed equity markets such as the United States and Europe, but contrarian effect is mainly evident in emerging stock markets. Although, contrarian strategy is a well-known anomaly among investors in emerging markets, the reason of its presence is not yet clear.

One way of examining whether contrarian effect is genuinely an anomaly, or an artifact of data mining is to investigate alternative data sets that have yet to be studied or have provided inconclusive findings. If contrarian effect persists in different markets, even in varying magnitude, it can be regarded as a systematic risk factor whose exposure could be accounted for through different mean profits. As suggested by the Adaptive Market Hypothesis (AMH) (Lo, 2004), the behavior of equity market anomalies may change over time across markets. Subsequently, the studies document that these variations may be caused by investor personality characteristics as well as elements related to the specific stock market environment (Urquhart & McGroarty, 2014; Shi & Zhou, 2017; Akhter &

Yong, 2019). Keeping in mind the AMH viewpoint, it is an important question to explore whether the factors relating to internal and external environment of stock market influence the performance of stock market anomalies. Therefore, this study attempts to investigate the role of firm-specific, industry-specific, macroeconomic, and global risk factors towards contrarian strategy's profitability.

This study has focused on South Asian emerging markets due to some distinctive characteristics of these markets in terms of stock market anomaly returns. It has been established in most of the existing studies that momentum effect is low in Asia-Pacific emerging markets and these markets exhibit consistent weak-form market inefficiencies (Chui et al., 2000; Hameed & Kusnadi, 2002; Griffin et al., 2003; McInish et al., 2008; Chui et al., 2010; M. Liu et al., 2011; Demirer et al., 2017). Retail investors' characteristics may be blamed for the inconsistency of evidence indicating low momentum and higher inefficiencies in South Asian emerging markets. Recent theoretical and empirical literature provides conclusive evidence of excessive speculation, insider trading, and information asymmetry among investors in these markets (Huang & Cheng, 2015; Neupane et al., 2017; Akhter & Yong, 2019). Higher information asymmetry among different classes of investors in these markets may create opportunities for short-term momentum and subsequent reversals for investors. According to Luo et al. (2021), skepticism leads to both momentum and contrarian profits. If investors become skeptical about the signal quality of others and assume that those who were among the first to possess information have learned very little, then, there is underreaction that causes momentum effect in the short-term period. On the other hand, if investors respond promptly to stale information causing an unnecessary increase in stock prices due to overreaction, thus reversals are likely to follow.

Some studies claim that industry-level classification also leads to higher profitability for investment strategies (Moskowitz & Grinblatt, 1999; O'Neal, 2000; Du & Denning, 2005; Demirer et al., 2015). Therefore, this study performs an in-depth analysis based on industry characteristics in order to analyze whether industry composition of stocks contributes to higher contrarian profitability in selected stock markets. Finally, the study examines the predictive ability of macroeconomic and global risk factors towards contrarian strategy payoffs. To date, numerous studies have examined the impact of macroeconomic factors on simple stock returns in developed equity markets (Kim, 2003; Humpe & Macmillan, 2009; Zeng et al., 2022), and emerging markets of Europe and Latin America (R. Verma & Ozuna, 2005; Abugri, 2008; Hanousek et al., 2009; Wang & Xu, 2015). Studies in the context of South Asian equity markets are fairly dated and most of them examined the influence of macroeconomic factors on simple stock returns or volatility in the context of an individual country (Gunasekarage et al., 2004; Ahmed, 2008; Sohail & Hussain, 2009; Khan et al., 2015; Khan et al., 2018). The studies provide mixed evidence regarding the nexus between macroeconomic factors and stock returns. For instance, Ahmed (2008) investigated the impact of macroeconomic factors in the Bangladeshi equity market and reveal that domestic macroeconomic variables have more predictive power towards stock returns as compared to FDI and international trade. Sohail and Hussain (2009), and Khan et al. (2015) indicate that inflation, currency rates, industrial production, and money supply significantly impact the performance of stocks in Pakistan stock market. While most of the prior studies looked at the impact of different macroeconomic factors on basic stock returns or volatility, the current study examines the effect of those macroeconomic factors on the predictability of returns for investment strategies, particularly for contrarian strategy. The study specifically examines whether past changes in macroeconomic factors predict the current changes in the profitability of contrarian investment strategy. Additionally, the

study examines the predictability of several global risk factors towards contrarian profitability.

The regional macroeconomic and global factors play a crucial role in the development of financial markets of the South Asian region. Over the last 20 years, these markets have undergone economic transformations, which reduced the trade barriers. For example, the economies like Pakistan, Bangladesh and India have experienced an average GDP growth of 5.48% over the years 1997 to 2019. Similarly, the countries witnessed more than 100% growth in FDI to GDP ratio during the similar period (World Bank, 2020). Furthermore, net foreign equity inflows for three countries were recorded as 198 billion USD from 1997 to 2019, accounting for approximately 100 percent share of foreign equity investments in this region and around 20% of international equity investment for middle- and low-income economies (World Bank, 2020). Overall, it is worth doing the required analysis for selected sample of emerging markets as these markets have long been vulnerable to global risk variables, partly due to their reliance on short-term inflows of capital to finance their large current account deficit, and partly because of the increased participation of foreign investors.

4.2 Data and Methodology

4.2.1 Data

The study gathers data from Thomson and Reuters DataStream and official websites of Bombay Stock Exchange (BSE), Pakistan Stock Exchange (PSX) and Dhaka Stock Exchange (DSE). The dataset comprises adjusted close prices, trading volume, and market value of all the listed stocks in each stock market. The sample period ranges from January 1997 to December 2020. To avoid the impact of small and inconsistent stocks, the study eliminates stocks that show inconsistent trading pattern. This method also assists in

maintaining the sample of stocks, which usually excludes the least liquid equities. To prevent any false perception of strong return continuation or reversals, the missing values of non-trading days are left blank and not replaced with any previous values. The monthly close prices of all listed equities are converted into monthly returns using the following continuous compounding return equation:

$$R_t = 100 \times ln(\frac{P_t}{P_{t-1}}) \quad (4.1)$$

Where, R_t represents the stock returns at time t, while P_t is the dividend-adjusted close price of stocks at time t, and P_{t-1} denotes the dividend-adjusted close price of stocks at time t-1.

This study uses Thomson Reuters Business Classification (TRBC) system, which is an industry classification method operated and owned by Thomson Reuters. This is a market-based categorization system in which companies are classified according to the market instead of the services or products they produce. Many investors and researchers use either Industry Classification Benchmark (ICB) or Global Industry Classification Standard (GICS) industry classification system, or any local market system such as developed by FTSE in the UK stock market. However, TRBC classification is more useful and effective because it uses most robust and objective procedure to identify the sector classification of a company. The TRBC is a five-tier industry categorization system where each tier further divides the stocks into extended specific sectors. Firstly, this classification method uniquely classifies the stocks into 10 economic sectors, each of which is then split into 28 business sectors. These business sectors are further sub-divided into 54 industry groups, 136 industries and finally 837 activities. This study applies second-tier classification of TRBC and divides the stocks into 22 industries common in each stock market. The industry

classification is made in such a way which ensures that sufficient industries are available to form industry portfolios and each industry portfolio contains reasonable number of stocks.

In addition to examining the predictability of firm and industry specific factors, following Wang and Xu (2015) and Demirer et al. (2017), the study utilizes various macroeconomic and global variables as potential predictors of contrarian profitability. Monthly data relating to all the economic and global variables is gathered from Thomson and Reuters DataStream. These predictors include three-month treasury rate (3M-INT), local currency to USD exchange rate (EXC), Consumer price index (CPI), Industrial production index (IPI), Balance of trade (BOT), Oil returns (OIL), Gold returns (GOLD), Morgan Stanley Capital International (MSCI) measuring the world market equity returns, and CBOE volatility index (VIX) measuring the global market volatility. This study uses first differences and return series of all the time series in order to ensure the stationarity of all the series.

4.2.2 Methodology

The study applies overlapping portfolio formation technique of Chen et al. (2016). Firstly, the study forms contrarian style portfolios based on trading volume and market value factors. Trading volume is considered a useful indicator of information asymmetry (Lee & Swaminathan, 2000), while market value-based style portfolios are particularly attractive for institutional and retail investors because it helps them in organizing and simplifying the portfolios allocation decisions (Barberis & Shleifer, 2003; H.-L. Chen & De Bondt, 2004). To construct trading volume-based contrarian portfolios, the study divides the stocks into five groups based on their trading volume. Top 20% of stocks in terms of trading volume form the highest liquidity portfolios and bottom 20% stocks form the lowest liquidity portfolios. Within each group of highest and lowest liquidity, the stocks

are further sorted into winners and losers portfolios on the basis of lagged 12-month returns. In order to test for style contrarian effect, the study forms contrarian style portfolios within each liquidity group by taking the long position in past loser style portfolios and short position in past winner style portfolios based on zero cost trading strategy. These arbitrage portfolios are held for next one month and rebalanced at the end of each month. Mean contrarian returns are calculated for each liquidity group based on equally weighted loser and winner portfolios over the holding period (t+1) month.

$$LMW_{HL,t} = Q_{HL,L,t} - Q_{HL,W,t} > 0 \quad (4.2)$$

$$LMW_{LL,t} = Q_{LL,L,t} - Q_{LL,W,t} > 0 \quad (4.3)$$

Here, $LMW_{HL,t}$ represents the loser minus winner (contrarian) portfolios for highest liquidity group at time t. Whereas, $Q_{HL,L,t}$ and $Q_{HL,W,t}$ respectively denote the loser and winner portfolios for highest liquidity group. Similarly, $LMW_{LL,t}$ represents the loser minus winner (contrarian) portfolios for lowest liquidity group at month t. While $Q_{LL,L,t}$ and $Q_{LL,W,t}$ respectively denote the loser and winner portfolios for lowest liquidity group. The same procedure is repeated to construct style portfolios based on market value, where loser and winner portfolios are formed within highest market value and lowest market value groups. If negative or insignificant contrarian returns are identified after controlling for trading volume or market value, the meaningful relationship between contrarian returns and selected stock related characteristics cannot be established. However, if significant contrarian returns are observed after controlling for trading volume and market value, we may conclude that some meaningful relationship exists between selected stock related characteristics and contrarian returns.

After analyzing the predictability of stock related factors, the study next moves to investigate the impact of industry characteristics on contrarian effect in selected emerging stock markets. Following Moskowitz and Grinblatt (1999), industry contrarian portfolios are formed. The study first categorizes stocks into 22 industry groups based on Thomson Reuters Business Classification (TRBC). Subsequently, industries are organized into different quintile portfolios on the basis of their past performance. The study forms portfolios on the basis of past 12-month and 6-month formation periods in order to deeply evaluate the industry contrarian effect. The winner industry portfolios comprise the industries with past 12-month or 6-month cumulative returns in the top 20%, whereas loser industry portfolios consist of the industries with past 12-month or 6-month cumulative returns in the bottom 20%. Then, contrarian portfolios are formed by longings the loser industry portfolios and shorting the winner industry portfolios. Portfolios are formed with one-month lag between formation and holding periods in order to control the impact of microstructure related issues. Monthly rebalancing is used to calculate contrarian (LMW) returns, which are calculated by comparing the returns of equally weighted losers and winners' portfolios over the holding period (t+1) month. As an alternate scheme, the study also evaluates the performance of industry-neutral contrarian portfolios. The study identifies the top three common industries that contain the highest number of equities in every stock market. Portfolios are formed within each industry pool in order to examine whether contrarian effect holds when industry impact is controlled for. Finally, the study investigates the influence of different market states on industry contrarian effect by dividing the overall study period into crises, non-crises, and Covid-19 sub-periods.

In the final section of analysis, the study investigates the predictability of macroeconomic and global factors towards contrarian profitability. By following Wang and Xu (2015), a predictive regression of the following form is used in panel data setting:

$$LMW_{i,t} = \alpha + \beta x_{i,t-1} + \varepsilon_{it} \quad (4.4)$$

Here, $LMW_{i,t}$ denotes the monthly time-series of contrarian returns for country i at time t. While $x_{i,t-1}$ denotes the vector of different predictors measured for each country at time t-1. As stated earlier, macroeconomic and global variables are used as potential predictors of contrarian returns. Along with these local and global predictors, market state and volatility factors are used as controlled variables as these factors are found to have significant effect on contrarian strategy's profitability in selected sample of emerging markets. The variables of market state and volatility are defined in terms of the lagged returns and volatility of market indexes. The study applies lagged 12-month and lagged 6-month definitions of market state and volatility factors.

4.3 Empirical Results and Discussions

4.3.1 Firm-level characteristics and contrarian effect

While simple price momentum or contrarian effect is a well-known aspect of financial markets, style investing is another important empirical observation that calls into question the theory of efficient capital markets. Investors categorize assets on the basis of different styles or stock characteristics, like market capitalization, book to market ratio, and earning to price ratio etc. In this section, the current study examines whether contrarian strategy based on different styles or stock characteristics generates higher returns for investors in emerging stock markets. The study forms contrarian strategy based on two important stock characteristics: trading volume and market capitalization. The significance of these factors for selected emerging stock markets has already been explained in previous sections.

Table 4.1 reports the profitability of volume-based contrarian portfolios formed by using the two-way sorting. As shown in Table 4.1, both the winners and losers portfolios of the highest trading volume group outperform the winners and losers portfolios of lowest trading volume group. However, lowest trading volume stocks generate highest contrarian returns in all the stock markets. For example, contrarian strategy formed on the basis of winners and losers stocks of lowest trading volume group generates 3.68%, 1.13%, and 4.25% monthly returns for Pakistan, Bangladesh, and India, respectively. All of the contrarian returns are significant for lowest volume stocks. On the other hand, portfolios of highest volume stocks generate negative contrarian (or momentum returns) for Bangladesh (-0.18%), and India (-0.03%) and contrarian returns for Pakistan (0.17%). However, the magnitude of these returns is lower than the contrarian portfolios of lowest trading volume stocks. In a nutshell, we find a strong statistical association between trading-volume and contrarian profits. The stocks that fall in lowest trading-volume quartile generate highest contrarian returns for investors. Also, the past winner portfolios in both volume groups experience greater short-term reversals in subsequent periods. These results corroborate the information asymmetry hypothesis of Lee and Swaminathan (2000), which claims that trading volume includes information content. Winner stocks with higher trading volume face greater information asymmetry, which results in more chances of overpricing of these overhyped stocks. When the stock market adjusts the price of underpriced and overpriced stocks in following periods, these overpriced stocks experience short-term return reversals. In comparison, the stocks with lower trading volume are less prone to information asymmetry problem, hence, outperform in subsequent periods that may lead to higher returns for contrarian investment strategies in selected emerging stock markets.

Table 4.1: Profitability of volume-based contrarian strategies

Country		Winner	Loser	Contrarian (LMW)
Pakistan	Highest Trading Volume	1.9979*** (3.20)	2.1687*** (3.18)	0.1708 (0.57)
	Lowest Trading Volume	-3.7728*** (-9.46)	-0.0857 (-0.23)	**3.6871*** (8.98)**
Bangladesh	Highest Trading Volume	2.3800** (4.11)	2.1965*** (3.91)	-0.1835 (-0.48)
	Lowest Trading Volume	-1.2843*** (-2.65)	-0.1452 (-0.32)	**1.1391*** (3.24)**
India	Highest Trading Volume	2.0142*** (2.68)	1.9823** (2.35)	-0.0319 (-0.08)
	Lowest Trading Volume	-3.0409*** (-8.10)	1.2129*** (2.62)	**4.2538*** (8.78)**

Notes - This table reports the profitability of trading volume-based contrarian strategies based on past 12-month formation periods in all the sample countries over the whole sample period (from January 1997 to December 2020). At the end of each month (t), the stocks are classified into 5 groups based on their trading volume (liquidity). The top 20% stocks form the highest trading volume group, while the bottom 20% stocks form the lowest trading volume group. Within the highest and lowest trading volume group, the stocks are further sorted based on their past twelve-month performance. The stocks having positive (negative) prior returns during the formation period t-12 to t-1are categorized as winner and loser portfolios. Contrarian profits represent the subsequent returns at (t+1) month holding period, calculated as the difference in return between the equally weighted loser and winner portfolio (LMW) in each liquidity group. In parentheses are the values of robust t-statistic that are adjusted for heteroskedasticity and autocorrelation based on Newey (1987). *, ** and *** denote the significance level at 10, 5 and 1 percent, respectively.

Next, the study examines the profitability of market capitalization-based contrarian strategies. The study applies the same procedure of two-way sorting of stocks on the basis of market capitalization and designs the portfolios of winners and losers stocks in highest market capitalization and lowest market capitalization groups. This style portfolio is built by taking the long position in small-cap portfolios and short position in large-cap portfolios. The results are reported in Table 4.2. The majority of the market value-based style portfolios yield positive and statistically significant contrarian returns. However, portfolios consisting of lowest market capitalization stocks generate higher contrarian

returns as compared to stocks with highest market capitalization. For example, the strategies based on lowest market capitalization stocks provide an average return of 4.27%, 0.71%, and 2.39%, respectively for Pakistan, Bangladesh, and India. The results are significant at 1% level of significance. In contrast, stocks with highest market capitalization generate an average return of 0.12%, -0.57%, and 0.73% for Pakistan, Bangladesh, and India, respectively. The overall results of this section prove the study hypothesis H_{2A} that firm-specific factors such as trading volume and market value show significant predictive power over contrarian profitability in selected emerging markets.

Our results are consistent with prior studies in a way that past research claim that value and small-cap stocks are riskier; hence demand greater rate of profits (H.-L. Chen & De Bondt, 2004; Aarts & Lehnert, 2005). H.-L. Chen and De Bondt (2004) address this issue by analyzing and presenting the cross-sectional risk (standard deviation) of various style investment portfolios. In the analysis of this section, the study observed higher rate of contrarian returns for small-cap portfolios but certainly the risk or standard deviation of these portfolios would also be usually higher since the study repeatedly takes long position in small-cap loser stocks. Generally, the study findings are consistent with previous studies. But looking at the practical implication of these findings, one can observe that the risk of loser portfolios formed with regular contrarian strategy will always be lower than the risk of loser portfolios formed through style investing. Therefore, regular contrarian strategies are considered more appropriate for investors in selected emerging markets.

4.3.2 Incorporating transaction costs

The study also examines the profitability of style investment strategies based on stock prices that specifically take into account transaction costs. Since emerging market liquidity is often weaker than that of developed market liquidity (see, Speidell & Krohne, 2007),

adding actual transaction costs, such as the bid-ask spread, to prices will improve the profitability of investment strategies in the presence of actual stock market imperfections. The study applies the model of Marshall et al. (2011) and Groot et al. (2012), which is considered more robust for frontier and emerging markets by keeping in mind the characteristics of these markets. By following the model of Marshall et al. (2011) and Groot et al. (2012), the study uses bid-ask spread as transaction cost. The data is collected from Thomson and Reuters Datastream. To control the effect of bid-ask bounce and other relevant costs, consistent with the above studies, the study skips the month-long time between the portfolio construction and holding periods.

The results are reported in appendix B. The findings reported in Appendix B.1 and B.2 incorporate transaction costs in style contrarian investment strategies. Table B.1 provide the profitability of style contrarian investment strategy formed on the bases of trading volume of sample stocks. Whereas Table B.2 reports findings of contrarian investment strategy constructed based on market value of selected stocks. As shown in Table B.1, the lowest trading volume stocks generate highest net contrarian returns in all the stock markets. For example, contrarian strategy formed on the basis of winners and losers stocks of lowest trading volume group generates 1.51%, 0.47%, and 1.06% monthly returns for Pakistan, Bangladesh, and India, respectively. All the contrarian returns are significant for lowest volume stocks. In a nutshell, we find a strong statistical association between trading-volume and contrarian profits.

Table B.2 in the Appendix provides the results of market value-based contrarian strategies by taking into account the effect of transaction costs. The portfolio of stocks consisting of lowest market value group yields higher net contrarian returns in all the sample stock markets. For example, the strategies based on lowest market capitalization

stocks provide an average net return of 2.76%, 0.32%, and 0.94%, respectively for Pakistan, Bangladesh, and India. Despite the lower percentage of returns, the results are still statistically and economically significant. In contrast, the group of stocks having highest market capitalization generate a negative net return of -1.36%, -0.55%, and -0.72% for Pakistan, Bangladesh, and India, respectively.

Although the magnitude of returns becomes lower when the study incorporates the transaction costs into the pricing of stocks; however, the overall results still support the prior hypotheses that trading volume and market value factors are found to have significant predictive power towards contrarian effect in selected emerging markets. Portfolio of stocks with lower trading volume and lower market value groups generate significant positive returns even when the transaction costs are accounted for.

Table 4.2: Profitability of Market Value-based contrarian strategies

Country		Winner	Loser	Contrarian (LMW)
Pakistan	Highest Market Value	1.1596*** (2.78)	1.2798*** (2.71)	0.1202 (0.43)
	Lowest Market Value	-3.5857*** (-7.51)	0.6867 (1.61)	**4.2724*** (9.18)**
Bangladesh	Highest Market Value	1.2922*** (2.79)	0.7219 (1.56)	-0.5703* (-1.81)
	Lowest Market Value	-0.5733 (-1.02)	0.1437 (0.26)	**0.7171* (1.92)**
India	Highest Market Value	0.7057 (1.30)	1.4442*** (2.93)	0.7385** (2.11)
	Lowest Market Value	-3.3622*** (-7.22)	-0.9672*** (-3.60)	**2.3950*** (5.53)**

Notes - This table reports the profitability of market value-based contrarian strategies based on past 12-month formation periods in all the sample countries over the whole sample period (from January 1997 to December 2020). At the end of each month (t), the stocks are classified into 5 groups based on their market value (capitalization). The top 20% stocks form the highest market value group, while the bottom 20% stocks form

the lowest market value group. Within the highest and lowest market value group, the stocks are further sorted based on their past twelve-month performance. The stocks having positive (negative) prior returns during the formation period t-12 to t-1 are categorized as winner and loser portfolios. Contrarian profits represent the subsequent returns at (t+1) month holding period, calculated as the difference in return between the equally weighted loser and winner portfolio (LMW) in each market value group. In parentheses are the values of robust t-statistic that are adjusted for heteroskedasticity and autocorrelation based on Newey (1987). *, ** and *** denote the significance level at 10, 5 and 1 percent, respectively.

The study next moves to analyze the influence of industry factors on contrarian effect in South Asian equity markets over the entire sample period, from January 1997 to December 2020. Tables 4.3, 4.4, and 4.5 present summary statistics and industry breakdowns for the Pakistani, Bangladeshi, and Indian stock markets, respectively. With respect to the number of firms in each sample market, personal goods, financials, and food producer sectors are market leaders. Another common characteristic of these markets is that the highest mean returns were generated by the healthcare, and Pharmaceuticals sectors. The highest market capitalization for Pakistani stock market belongs to the Oil and Gas industry, while Fixed Line Telecommunications industry holds the highest market capitalization for Bangladeshi and Indian stock markets. On the other hand, Fixed Line Telecommunications and Electricity are the industries holding the highest share of trading volume for Pakistani and Bangladeshi markets, respectively. However, media and technology industries lead with the highest share of trading volume in Indian stock market over the whole study period. Overall, the study observes the diverse characteristics of different industry groups in each sample stock market. Moreover, the results further reveal that the cross-sectional mean returns, trading volume and market capitalization of industry clusters were statistically different from one another in every stock market. Therefore, it is worth investigating the impact of industry factors on contrarian effect keeping in mind the dissimilar performance and diverse characteristics of industry groups in selected contrarian-driven emerging markets.

Table 4.3: Descriptive statistics of Industries in Pakistan (January 1997 to December 2020)

Name of Industry	No. of firms	Percentage of firms	Avg Market Capitalization (In Millions)	Avg Trading Volume (In Thousands)	Mean Returns	Standard Deviation
Automobiles and Parts	20	4.1%	7048.26	3924.88	0.9576	15.5834
Chemicals	33	6.8%	12606.9	24085.46	0.5303	14.4465
Construction and Materials	30	6.2%	6941.60	19973.30	0.2569	17.0990
Electricity	17	3.5%	14146.52	26390.51	-0.2654	14.0024
Electronic and Electrical Equipment	5	1.0%	728.33	1084.04	0.4703	18.0652
Financials	86	17.7%	12271.58	17956.77	0.2153	17.2724
Fixed Line Telecommunications	4	0.8%	25622.07	115450.61	-0.2235	15.4199
Food Producers	55	11.3%	7616.57	4824.09	0.7588	15.4519
Forestry and Paper	4	0.8%	1790.57	866.56	0.8014	14.2968
General Industrials	16	3.3%	4682.95	15184.98	0.3139	16.3806
Health Care Equipment and Services	3	0.6%	10522.92	685.44	1.4649	14.5039
Household Goods and Home Construction	2	0.4%	4804.49	27862.25	1.2717	16.2181
Industrial Engineering	6	1.2%	1384.28	516.99	0.8477	23.4880
Industrial Metals and Mining	13	2.7%	5552.87	15620.98	0.3209	16.0003
Industrial Transportation	3	0.6%	16054.70	37353.57	0.7558	16.8153
Media	2	0.4%	3303.15	13599.22	-0.5273	22.6327
Oil and Gas	14	2.9%	82599.15	76931.80	0.5995	14.0260
Personal Goods	151	31.0%	1405.58	1826.42	0.3712	19.0492
Pharmaceuticals and Biotechnology	10	2.1%	13449.99	2723.49	1.3946	14.3611
Real Estate Investment and Services	4	0.8%	7285.73	16387.20	-0.1037	16.4638
Technology	4	0.8%	6290.75	22553.93	1.3116	14.8090
Travel and Leisure	5	1.0%	5146.70	8364.84	0.9032	19.2343
Total	**487**	**100%**				

Notes - This table provides the summary statistics of industries in Pakistan stock market (PSX). As per the Thomson Reuters Business Classification (TRBC), stocks are classified into 22 different industry groups based on their market activity. Number of active firms, average market capitalization, average trading volume, mean returns and standard deviations are reported in this table. The study period ranges from 1997 to 2020.

Table 4.4: Descriptive statistics of Industries in Bangladesh (January 1997 to December 2020)

Name of Industry	No. of firms	Percentage of firms	Avg Market Capitalization (In Millions)	Avg Trading Volume (In Thousands)	Mean Returns	Standard Deviation
Automobiles and Parts	5	1.6%	6033.24	7843.77	0.0014	14.7131
Chemicals	9	2.8%	8594.11	9055.70	0.1675	12.9580
Construction and Materials	17	5.3%	6875.20	7564.80	0.4277	14.8123
Electricity	9	2.8%	24511.82	19623.46	0.4773	11.3839
Electronic and Electrical Equipment	5	1.6%	2454.97	1714.61	0.3075	16.0402
Financials	109	33.9%	5543.54	16029.24	0.8888	13.8737
Fixed Line Telecommunications	4	1.2%	101055.77	12083.31	0.7289	11.7238
Food Producers	18	5.6%	1972.84	6956.57	0.5329	16.8379
Forestry and Paper	4	1.2%	3977.33	6422.83	0.2449	14.9626
General Industrials	9	2.8%	3307.80	14795.29	-0.0430	13.1083
Health Care Equipment and Services	3	0.9%	1126.54	1179.48	0.9614	12.5799
Household Goods and Home Construction	3	0.9%	2070.82	3569.18	0.9479	15.8500
Industrial Engineering	-	-	-	-	-	-
Industrial Metals and Mining	13	4.0%	6193.14	15117.59	-0.7004	12.9438
Industrial Transportation	3	0.9%	4653.70	17617.37	-0.3920	16.5632
Media	-	-	-	-	-	-
Oil and Gas	6	1.9%	21659.72	10815.76	0.5398	13.7218
Personal Goods	73	22.7%	2900.87	15125.56	-0.1814	14.0108
Pharmaceuticals and Biotechnology	17	5.3%	8797.67	14562.61	0.9947	12.0097
Real Estate Investment and Services	3	0.9%	2554.27	11468.46	0.1583	12.8918
Technology	8	2.5%	1840.96	10343.93	0.8689	12.4558
Travel and Leisure	4	1.2%	6515.26	10832.84	0.4099	11.8448
Total	**322**	**100%**				

Notes - This table provides the summary statistics of industries in Dhaka Stock Exchange (DSE). As per the Thomson Reuters Business Classification (TRBC), stocks are classified into 22 different industry groups based on their market activity. Number of active firms, average market capitalization, average trading volume, mean returns and standard deviations are reported in this table. The study period ranges from 1997 to 2020.

Table 4.5: Descriptive statistics of Industries in India (January 1997 to December 2020)

Name of Industry	No. of firms	Percentage of firms	Avg Market Capitalization (In Millions)	Avg Trading Volume (In Thousands)	Mean Returns	Standard Deviation
Automobiles and Parts	45	1.9%	601.13	463.35	0.1233	17.5952
Chemicals	193	8.0%	465.18	422.88	0.2546	19.3642
Construction and Materials	123	5.1%	399.38	384.96	-0.3368	18.8602
Electricity	12	0.5%	134.40	650.69	-0.5697	19.2436
Electronic and Electrical Equipment	5	0.2%	63.813	185.58	-0.4560	16.6830
Financials	613	25.4%	637.17	429.45	-0.3746	17.1621
Fixed Line Telecommunications	6	0.3%	744.99	648.46	-0.9312	20.3713
Food Producers	203	8.4%	470.96	255.97	-0.0126	17.7009
Forestry and Paper	43	1.8%	564.12	505.85	-0.6360	19.8591
General Industrials	55	2.3%	227.99	197.15	-0.3883	17.7014
Health Care Equipment and Services	22	0.9%	233.91	142.89	0.0713	17.8424
Household Goods and Home Construction	41	1.7%	484.44	159.80	-0.2423	16.4407
Industrial Engineering	121	5.0%	524.40	317.82	0.2519	18.3610
Industrial Metals and Mining	141	5.8%	588.77	649.23	0.2759	19.2625
Industrial Transportation	25	1.0%	391.15	266.54	-0.1277	19.5783
Media	25	1.0%	626.06	1111.14	-0.7338	21.6857
Oil and Gas	13	0.6%	327.54	128.62	0.0148	21.6107
Personal Goods	280	11.6%	265.88	260.94	-0.1286	18.7265
Pharmaceuticals and Biotechnology	118	4.9%	492.08	497.86	0.2840	20.5177
Real Estate Investment and Services	80	3.3%	625.62	633.47	-0.1378	17.8027
Technology	186	7.7%	349.72	779.79	-0.8226	21.3189
Travel and Leisure	63	2.6%	404.88	168.73	-0.3458	18.2375
Total	**2413**	**100**				

Notes - This table provides the summary statistics of industries in Bombay Stock Exchange (BSE). As per the Thomson Reuters Business Classification (TRBC), stocks are classified into 22 different industry groups based on their market activity. Number of active firms, average market capitalization, average trading volume, mean returns and standard deviations are reported in this table. The study period ranges from 1997 to 2020.

4.3.3 Industry Contrarian Effect

In this section, the study analyzes the performance of industry contrarian strategies based on 22 sectors in each stock market over the whole sample period (January 1997 - December 2020). Table 4.6 provides the excess returns of winners and losers industries on the basis of past 12- and 6-month cumulative returns of industries. The industry contrarian returns are determined by differencing the returns of equally weighted loser and winner industry portfolios (LMW).

As shown in Table 4.6, the industry contrarian effect is persistent and strong in all the sample stock markets during the sample period. Both twelve-month and six-month contrarian strategies produce statistically significant contrarian returns for all the markets, except for twelve-month strategy in Indian stock market. The strategy with twelve-month formation period generates positive contrarian returns for Pakistani and Bangladeshi stock markets – 0.21% and 0.035% per month, respectively. The same strategy yields negative contrarian returns (or momentum profits) of -0.19% for Indian equity market. However, strategies that require six-month formation period yield the strong and persistent contrarian returns for all the stock markets. Although, stock-level contrarian effect was comparatively strong (reported in Essay 1), trading strategies based on industry clustering also provide persistent and significant returns especially for strategies having shorter formation period. Moreover, the study finds overreaction effect in most of the cases where loser industry portfolios outperform their winner industry counterparts by attaining significantly positive returns during the subsequent holding periods.

The evidence of industry contrarian effect provided in current study contradicts with the results of developed markets where significant industry momentum effect was found (Moskowitz & Grinblatt, 1999; Swinkels, 2002; Ji & Giannikos, 2010). Moskowitz and

Grinblatt (1999) report 0.46% monthly momentum returns, while Swinkels (2002) and Ji and Giannikos (2010) show 0.65% monthly momentum returns based on industry groups in the European stock markets. Moreover, Li et al. (2014) reveal that significant industry momentum returns can be generated only with longer formation period in Australian equity markets. However, this study presents the evidence that shorter horizon ranking period strategies generate more pronounced and significant contrarian returns in South Asian equity markets. Although, the magnitude of yearly momentum returns is higher in developed markets, the findings of this study provide a hint that in emerging markets, stocks having similar industry show a greater propensity to overreact and hence produce industry-specific contrarian returns. Further analysis based on industry-neutral portfolios, and sub-sampling holding period analysis of this study will offer more insights regarding the dynamics of industry contrarian effect in selected emerging markets.

Table 4.6: Profitability of Industry Contrarian Strategies (January 1997 to December 2020)

Country		Winner	Loser	Contrarian (LMW)
Pakistan	12-month formation period	0.5059*** (4.61)	0.7201*** (6.28)	**0.2142**** **(2.21)**
	6-month formation period	0.5842*** (5.34)	0.8405*** (7.87)	**0.2563***** **(2.82)**
Bangladesh	12-month formation period	0.2893** (2.19)	0.3243*** (3.06)	**0.0350** **(0.28)**
	6-month formation period	-0.0104 (-0.07)	0.6847*** (5.73)	**0.6951***** **(5.24)**
India	12-month formation period	0.1594 (1.36)	-0.0402 (-0.43)	**-0.1996**** **(-2.21)**
	6-month formation period	-0.1838* (-1.65)	0.1799* (1.87)	**0.3637***** **(3.98)**

Notes - This table reports the profitability of industry-specific contrarian strategies based on past 12-month and 6-month formation periods in all the sample countries over the whole sample period (from January 1997 to December 2020). At the end of each month (t), the industries are classified into winners and losers portfolios based on past 12- and 6-month cumulative returns of industries. The industries having positive (negative) prior returns during the formation period t-12 to t-1 and t-6 to t-1 are categorized as winner and loser industries. Contrarian profits represent the subsequent returns at (t+1) month holding period, calculated as the difference in return between the equally weighted loser and winner portfolio (LMW). In parentheses

are the values of robust t-statistic that are adjusted for heteroskedasticity and autocorrelation based on Newey (1987). *, ** and *** denote the significance level at 10, 5 and 1 percent, respectively.

In order to examine the stability of industry contrarian effect in selected stock markets, the study next explores the profitability of contrarian investment strategies across different time periods: the sub-sample of crisis periods (Asian financial crisis, Global crisis, Covid-19) and non-crisis periods. Panels A, B and C of Table 4.7 respectively provide the payoffs to winners, losers, and contrarian portfolios during Asian financial crisis, global crisis, and Covid-19 sub-sample periods. The results of the sub-period between Asian financial crisis and global crisis are presented in Panel A of Table 4.8, whereas the results of the sub-period between global crisis and Covid-19 epidemic are provided in Panel B.

As evident in Panel A of Table 4.7, contrarian strategy based on 12-month formation period yields positive contrarian returns for all the markets except for India during the Asian financial crisis. Importantly, the results are more pronounced and highly significant based on 6-month contrarian strategy in all the markets. Consistent with the stock-level contrarian effect (reported in Essay 1) during Asian financial crisis, the findings of current essay corroborate that the Asian crisis had a significant large effect on the efficiency of South Asian stock markets as compared to global crisis. Next, moving to the global crisis, Panel B depicts that contrarian returns are positive and significant for 12-month contrarian strategy, but the magnitude is lower than the returns of Asian crisis. This was somewhat expected because of the small effect of global crisis on South Asian stock markets. Finally, contrarian returns are less pronounced during the sub-sample of Covid-19 pandemic as evident in Panel C, where the magnitude of returns is either smaller or negative for most of the instances. The strategy yields positive returns only for Bangladeshi stock market based on 12-month and 6-month formation periods. In a similar vein, industry contrarian effect is again weak during the non-crisis periods as reported in Panels A and B of Table 4.8, where

most of the strategies generate negative contrarian profits in all the sample markets. The negative returns yielded during the non-crisis periods reveal that the industry contrarian effect is possibly associated with the crisis periods and negative market states.

Table 4.7: Industry contrarian effect across different time spans (Crises periods)

Country		Winner	Loser	Contrarian (LMW)
Panel A: Industry Contrarian Returns during Asian Financial Crisis (From Jan 1998 to Dec 1999)				
Pakistan	12-month formation period	-3.3871***	1.4699***	**4.8571*** **
		(-9.48)	(4.09)	**(10.79)**
	6-month formation period	-2.3409***	0.3310	**2.6719*** **
		(-7.50)	(0.93)	**(7.66)**
Bangladesh	12-month formation period	-1.5435***	-1.0415**	**0.5020**
		(-4.58)	(-2.42)	**(1.04)**
	6-month formation period	-5.1936***	-3.0915***	**2.1021** **
		(-6.85)	(-6.38)	**(2.04)**
India	12-month formation period	4.2803***	3.9382***	**-0.3421**
		(5.56)	(10.29)	**(-0.54)**
	6-month formation period	1.8426***	4.2787***	**2.4361*** **
		(2.89)	(11.05)	**(4.48)**
Panel B: Industry Contrarian Returns during Global Financial Crisis (From Oct 2007 to Sep 2009)				
Pakistan	12-month formation period	-4.7616***	-2.7716***	**1.9900*** **
		(-9.87)	(-4.97)	**(3.95)**
	6-month formation period	-0.4679	-2.1098***	**-1.6419*** **
		(-0.92)	(-4.36)	**(-3.57)**
Bangladesh	12-month formation period	4.5179***	5.8852***	**1.3672*** **
		(9.79)	(14.27)	**(3.25)**
	6-month formation period	2.8207***	5.3737***	**2.5529*** **
		(6.93)	(16.75)	**(8.21)**
India	12-month formation period	-0.8264	0.1036	**0.9301*** **
		(-1.60)	(0.22)	**(4.34)**
	6-month formation period	0.1528	0.0692	**-0.0836**
		(0.39)	(0.16)	**(-0.44)**
Panel C: Industry Contrarian Returns during Covid19 Pandemic (From Jan 2020 to Dec 2021)				
Pakistan	12-month formation period	2.3391***	-0.2893	**-2.6284*** **
		(3.78)	(-0.85)	**(-6.21)**
	6-month formation period	2.6158***	1.9206***	**-0.6951** **
		(5.69)	(5.83)	**(-2.20)**
Bangladesh	12-month formation period	0.4192	1.6532***	**1.2339*** **
		(0.98)	(4.40)	**(6.18)**
	6-month formation period	2.2479***	3.2866***	**1.0387*** **
		(5.77)	(10.06)	**(3.98)**
India	12-month formation period	4.3576***	4.1606***	**-0.1969**
		(10.81)	(21.04)	**(-0.81)**
	6-month formation period	4.7164***	3.2487***	**-1.4677*** **
		(16.13)	(19.03)	**(-8.87)**

Notes - This table reports the profitability of industry-specific contrarian strategies based on past 12-month and 6-month formation periods across different time periods. Panels A, B, and C returns during Asian Financial crisis, Global crisis and Covid-19 sub-periods. At the end of each month (t), the industries are classified into winners and losers portfolios based on past 12- and 6-month cumulative returns of industries. The industries having positive (negative) prior returns during the formation period t-12 to t-1 and t-6 to t-1 are categorized as winner and loser industries. Contrarian profits represent the subsequent returns at (t+1) month

holding period, calculated as the difference in return between the equally weighted loser and winner portfolio (LMW). In parentheses are the values of robust t-statistic that are adjusted for heteroskedasticity and autocorrelation based on Newey (1987). *, ** and *** denote the significance level at 10, 5 and 1 percent, respectively.

Moreover, the negative contrarian returns observed during Covid-19 and non-crisis sub-periods occurred either due to outperformance of prior winner stocks or because of the short-term reversals of prior loser stocks during non-crisis or positive market states. However, some of these results are not statistically significant, and hence lose statistical reliance. This study again attributes these results to the overreaction phenomenon and provides behavioral explanation that investors feel fear during negative market states or crisis periods and search for save heavens. Therefore, flock in to high quality winner stocks, which lead to overpricing of these stocks. These overpriced stocks experience short-term reversals when the stock market adjusts the prices of underpriced and overpriced stocks. The overall findings of this section comply with prior studies which suggest that the contrarian impact is highly variable across time and dependent on stock market states (Cooper et al., 2004; Urquhart & McGroarty, 2014).

For robustness of prior findings, the study also examines the behavior of contrarian strategies during the sub-periods that do not include crisis periods and the results are reported in Table 4.8. Although not persistent, but the results reveal a similar contrarian effect during the time between Asian financial crisis and global crisis. However, following the global financial crisis, weak or no contrarian effect is found. The negative returns of contrarian strategy reported in Panel B of Table 4.8 show strong momentum effect in the aftermath of the global financial crisis. The winner portfolios generated higher returns, as indicated by the large positive profits during the sub-periods that exclude the two crises. These findings comply with the underreaction hypothesis of Grinblatt and Han (2005), which claims that winners experience more momentum after the decreasing trend of

market. The findings are also in line with those studies that claim that contrarian profits are lower under up states of the market (Cooper et al., 2004; Daniel & Moskowitz, 2016).

Table 4.8: Industry contrarian effect across different time spans (Non-Crises periods)

Country		Winner	Loser	Contrarian (LMW)
Panel A: Industry Contrarian Returns during Jan 2000 to Sep 2007				
Pakistan	12-month formation period	1.5415***	2.0992***	**0.5577*** **
		(7.93)	(9.86)	**(3.22)**
	6-month formation period	1.3840***	2.7766***	**1.3926*** **
		(7.60)	(15.83)	**(9.59)**
Bangladesh	12-month formation period	0.5109***	0.5034***	**-0.0075**
		(3.71)	(4.40)	**(-0.06)**
	6-month formation period	0.0393	0.7094***	**0.6701*** **
		(0.28)	(5.56)	**(4.82)**
India	12-month formation period	1.2319***	0.4870**	**-0.7449*** **
		(6.01)	(2.15)	**(-4.78)**
	6-month formation period	0.4227**	0.4670**	**0.0443**
		(2.38)	(2.19)	**(0.27)**
Panel B: Industry Contrarian Returns during Oct 2009 to Dec 2019				
Pakistan	12-month formation period	1.3309***	0.3128**	**-1.018*** **
		(9.63)	(1.96)	**(-8.87)**
	6-month formation period	0.6591***	0.3671**	**-0.2919** **
		(4.73)	(2.33)	**(-2.45)**
Bangladesh	12-month formation period	-0.5186***	-0.5653***	**-0.0467**
		(-2.75)	(-3.03)	**(-0.38)**
	6-month formation period	-0.7680***	-0.1357	**0.6322*** **
		(-4.12)	(-0.79)	**(6.20)**
India	12-month formation period	-0.5843***	-0.8388	**-0.2545*** **
		(-6.92)	(-10.22)	**(-3.81)**
	6-month formation period	-0.4520***	-0.5537***	**-0.1017**
		(-5.37)	(-6.64)	**(-1.57)**

Notes - This table reports the profitability of industry-specific contrarian strategies based on past 12-month and 6-month formation periods across different time periods. Panels A reports the results during the period between Asian financial crisis and global crisis, while panel B provides the results during the period between Global financial crisis and Covid-19 pandemic. At the end of each month (t), the industries are classified into winners and losers portfolios based on past 12- and 6-month cumulative returns of industries. The industries having positive (negative) prior returns during the formation period t-12 to t-1 and t-6 to t-1 are categorized as winner and loser industries. Contrarian profits represent the subsequent returns at (t+1) month holding period, calculated as the difference in return between the equally weighted loser and winner portfolio (LMW). In parentheses are the values of robust t-statistic that are adjusted for heteroskedasticity and autocorrelation based on Newey (1987). *, ** and *** denote the significance level at 10, 5 and 1 percent, respectively.

4.3.3.1 Industry-neutral Contrarian effect

This section explores the industry-dependent contrarian effect in order to examine whether industry-dependent portfolios contribute to the stock-level contrarian effect in sample emerging markets. To ensure that the portfolios contain sufficient firms, the study

selects the following three largest industries from each stock market: personal goods, financials, and food producers. Personal goods industry contains 151, 73, and 280 firms, respectively for Pakistan, Bangladesh, and India. Financials industry consists of 86, 109, and 613 firms for the same set of countries. Finally, the food producer industry comprises 55, 18, and 203 firms, respectively for Pakistani, Bangladeshi, and Indian stock market.

The results reported in Panel A, B, and C of Table 4.9 show positive returns for most of the contrarian strategies based on 12-month formation periods. Interestingly, however, contrarian returns become higher and more significant with short-distant ranking period of 6 months. For instance, in personal goods industry, contrarian strategy with 6-month formation period yields 6.12%, 2.79%, and 5.27%, respectively for Pakistan, Bangladesh. Similarly, financials and food producers generate more positive returns with 6-month ranking period strategies as compared to 12-month or any other combination of strategies analyzed in previous sections. When contrarian investment strategies are implemented with a similar industry, the magnitude of positive returns observed in previous sections become higher and more significant in all the three industries. On average, industry-neutral contrarian portfolios generate monthly mean profit of 3.22%[2], -0.03%, and 4.30%, respectively for Pakistan, Bangladesh, and India based on the 12-month formation period. Whereas 4.33%[3] (for Pakistan), 1.95% (for Bangladesh), and 4.56% (for India) mean contrarian returns are yielded based on strategies with 6-month formation period. In other

[2] These profits represent the average monthly profits calculated by averaging the profits of personal goods (PG), financials (Fin), and food producers (FP) sectors for each country. For example:

For Pakistan 12-month strategy = [4.3728 (PG) + 3.5589 (Fin) + 1.7184 (FP)] / 3 = 3.22%,

[3] For Pakistan 6-month strategy = [6.1251 (PG) + 4.7396 (Fin) + 2.1138 (FP)] / 3 = 4.33%

* The same procedure is repeated for average monthly profit calculations of Bangladesh and India.

words, industry contrarian effect becomes stronger and highly significant when the industry impact is accounted for.

Table 4.9: Industry-Neutral Contrarian Portfolios

Country		Winner	Loser	Contrarian (LMW)
Panel A: Personal Goods				
Pakistan	12-month formation period	-1.5584***	2.8144***	**4.3728*** **
		(4.61)	(6.28)	**(2.21)**
	6-month formation period	-2.5407***	3.5844***	**6.1251*** **
		(5.34)	(7.87)	**(2.82)**
Bangladesh	12-month formation period	-0.5401***	0.7572***	**1.2973*** **
		(2.19)	(3.06)	**(0.28)**
	6-month formation period	-1.2843***	1.5084***	**2.7928*** **
		(-0.07)	(5.73)	**(5.24)**
India	12-month formation period	-2.6369	2.1827	**4.8196*** **
		(1.36)	(-0.43)	**(-2.21)**
	6-month formation period	-2.9469*	2.3268*	**5.2737*** **
		(-1.65)	(1.87)	**(3.98)**
Panel B: Financials				
Pakistan	12-month formation period	-1.1649***	2.3939***	**3.5589*** **
		(4.61)	(6.28)	**(2.21)**
	6-month formation period	-1.9476***	2.7919***	**4.7396*** **
		(5.34)	(7.87)	**(2.82)**
Bangladesh	12-month formation period	0.5272**	0.6359***	**0.1086** **
		(2.19)	(3.06)	**(2.17)**
	6-month formation period	-0.2084	1.9112***	**2.1196*** **
		(-0.07)	(5.73)	**(5.24)**
India	12-month formation period	-1.7810	1.868	**3.6491*** **
		(1.36)	(-0.43)	**(-2.21)**
	6-month formation period	-1.8421***	1.7830***	**3.6252*** **
		(-1.65)	(1.87)	**(3.98)**
Panel C: Food Producers				
Pakistan	12-month formation period	0.1043***	1.8227***	**1.7184*** **
		(4.61)	(6.28)	**(2.21)**
	6-month formation period	0.0352	2.1490***	**2.1138*** **
		(0.55)	(7.87)	**(2.82)**
Bangladesh	12-month formation period	1.5981**	0.1125***	**-1.4856**
		(2.19)	(3.06)	**(0.28)**
	6-month formation period	0.1197	1.0659***	**0.9462*** **
		(0.51)	(4.87)	**(3.38)**
India	12-month formation period	-2.1242	2.2826	**4.4069*** **
		(1.36)	(-0.43)	**(-2.21)**
	6-month formation period	-2.5026***	2.2661***	**4.7687*** **
		(-1.65)	(1.87)	**(3.98)**

Notes - This table reports the profitability of industry-neutral contrarian portfolios based on past 12-month and 6-month formation periods. The study identifies the top three common industries that contain the highest number of stocks in each stock market (i.e., Personal Goods, Financials, and Food Producers). Portfolios are formed within each industry pool to examine the industry-neutral contrarian effect. At the end of each month (t), the industries are classified into winners and losers portfolios based on past 12- and 6-month cumulative returns of industries. The industries having positive (negative) prior returns during the formation period t-12 to t-1 and t-6 to t-1 are categorized as winner and loser industries. Contrarian profits represent the subsequent returns at (t+1) month holding period, calculated as the difference in return between the equally weighted

loser and winner portfolio (LMW). In parentheses are the values of robust t-statistic that are adjusted for heteroskedasticity and autocorrelation based on Newey (1987). *, ** and *** denote the significance level at 10, 5 and 1 percent, respectively.

The overall findings of this section prove the study hypothesis H_{2B} by implying that the performance of contrarian investment strategy is influenced by the industry classification, so industry aspect cannot be neglected while interpreting the returns of investment strategies in selected emerging markets. The results relating to industry contrarian effect are unique in emerging market context as these contradict with the results of prior studies that observed industry momentum effect in relatively developed markets (Moskowitz & Grinblatt, 1999; Tan & Cheng, 2019). Moreover, the magnitude of industry-neutral contrarian returns is economically larger than the momentum returns observed in the US and European markets. As per Moskowitz and Grinblatt (1999), industry momentum effect can be attributed to herding behavior of investors. However, herding behavior may also cause overpricing of winner stocks when investors follow the herd and invest in hot stocks and flock out of cold stocks within an industry. This behavior may lead to an unnecessary increase in stock prices of hot stocks, which results is contrarian profits in the short-term when these stocks experience subsequent short-term reversals.

4.3.4 Predictability of macroeconomic and global factors

After presenting the role of stock- and industry-level characteristics towards the profitability of contrarian strategy, the study next moves to investigate the predictability of macroeconomic and global factors. In this regard, the study explores whether the predictability arises from prior losers and winner stocks, or some macroeconomic and global factors show predictability. After controlling the impact of market state and volatility factors, the study regresses the return series of losers, winners, and contrarian portfolios on various predictors in different combinations. The predictors used in this

analysis include consumer price index (CPI), industrial production index (IPI), balance of trade (BOT), exchange rate (domestic currency/USD), crude oil prices, and three-month T-bill rate for all the markets in order to control the impact of domestic liquidity. The results of the overall analysis are presented in Table 4.10.

As evident in Panels A, B and C of Table 4.10, market state and volatility factors show strong significant effect on the performance of past winners, losers, and contrarian portfolios. There is a positive association between the overall market state and winner stocks' returns meaning that winner stocks generate higher returns when market performs well and vice versa. However, the negative and significant coefficients of -VOL reveal that winner portfolios experience short-term reversals in the negative market state, which may lead to higher contrarian returns during down states of the market. On the other hand, positive and significant volatility coefficients (+VOL and -VOL) of past losers and contrarian stock portfolios show that both losers and contrarian portfolios yield higher returns during the extreme states of the market. These results are consistent with prior findings reported in Table 3.6 of Essay 1 that market volatility show significant predictive power towards the payoffs to loser stock portfolios.

Interestingly, three-month Treasury bill rate (3M-INT) representing domestic liquidity shows significant predictability for all the return series (losers, winners and contrarian portfolio returns). These findings point to the potential influence of liquidity on reversals in selected emerging markets. There is a negative association between 3M T-bill rate and the returns of both winners and losers' portfolios. These results imply that investors prefer to invest in risk free securities by leaving their positions from stocks. However, the highly negative coefficient of winner portfolios compared to losers implies that an increase in interest rate more adversely effects the performance of winner stocks, which causes high

losses to winner stock portfolios. Consequently, the contrarian strategy yields higher returns due to short-term reversals of high quality (winner) stocks in subsequent period.

In a similar vein, other macroeconomic factors like exchange rate, CPI, IPI and BOT have predictive power towards winner portfolios, but BOT is a common predictor for loser and contrarian portfolios. Finally, in contradiction with Demirer et al. (2017), crude oil is not a significant predictor of returns to winners, loser, and contrarian portfolios in South Asian stock markets. Besides, some other regional factors such as three-month treasury rate, exchange rate, CPI, IPI and BOT show significant predictive ability over contrarian returns in this region, which proves hypothesis H_{2C} of this study.

The results of predictive regression for loser portfolio returns reported in Panel B suggest that Industrial Production Index (IPI) is a robust and significant predictor of loser stock returns even after controlling for market state and volatility factors. The positive sign of IPI indicates that higher future growth expectation leads to greater subsequent returns on past loser portfolios, which causes higher reversals or contrarian returns in selected emerging stock markets. In this context, Liu and Zhang (2008) reveal that the industrial production growth rate predicts more than 50% variation of momentum profits in US equity market. The significant impact of domestic liquidity (3M-INT) is more appealing and intuitive considering the fact that investors shift their position from bonds to cheap and possibly underpriced stocks, which results in greater reversals in emerging stock markets. Given the existence of contrarian impact in South Asian stock markets, it is reasonable to conclude that IPI, BOT, and 3M-INT are the prominent macroeconomic risk factors that show significant predictive power and contribute to short-term reversals in loser portfolios and contrarian strategy payoffs.

Table 4.10: Predictability of regional macroeconomic factors towards contrarian profitability

MKT	VOL	+VOL	-VOL	3M-INT	EXC	CPI	IPI	BOT	OIL	Ad. R^2
Panel A: Winners										
0.0090*	-0.3198*									0.021
(1.82)	(-1.83)									
0.0106*		-0.3254	-0.3080***							0.022
(1.94)		(-1.58)	(-2.80)							
0.0050	-0.0501			-0.3609***	-0.3911***	0.3055*	0.0711***	0.5704***	-0.0007	0.058
(0.69)	(-1.30)			(-16.02)	(-6.79)	(1.72)	(3.21)	(4.75)	(-0.05)	
-0.0061		-0.0052	-0.1339*	-0.3587***	-0.3820***	0.3222*	0.0723***	0.5320***	0.0003	0.060
(-0.43)		(-0.51)	(-1.69)	(-16.23)	(-6.67)	(1.79)	(3.18)	(4.06)	(0.02)	
Panel B: Losers										
0.0027	0.1235									0.002
(0.42)	(0.55)									
0.0141*		0.0835	0.2082							0.004
(1.71)		(0.40)	(0.85)							
-0.0101**	0.4108***			-0.1316***	-0.3802	0.1102	0.0969***	0.2639***	0.0158	0.046
(-2.57)	(4.13)			(-3.23)	(-0.84)	(0.33)	(3.30)	(7.16)	(0.80)	
-0.0023		0.3792***	0.4698**	-0.1332***	-0.3866	0.0984	0.0961***	0.2909***	0.0151	0.047
(-0.15)		(6.49)	(2.04)	(-3.18)	(-0.84)	(0.29)	(3.23)	(4.01)	(0.70)	
Panel C: Contrarian Returns										
-0.0151**	0.4610***			0.2293***	0.0108	-0.1954	0.0257	-0.3065**	0.0166	0.054
(-2.26)	(7.52)			(4.59)	(0.02)	(-0.39)	(0.99)	(-2.07)	(1.44)	
0.0039		0.3843***	0.6037***	0.2254***	-0.0046	-0.2238	0.0237	-0.2410*	0.0148	0.058
(0.41)		(6.07)	(3.92)	(4.26)	(-0.01)	(-0.44)	(0.94)	(1.72)	(1.16)	

Notes – This table provides the results of regression Eq. 4 ($LMW_{i,t} = \alpha + \beta x_{i,t-1} + \varepsilon_{it}$). At the end of every month (t), the stocks are classified into winners and losers portfolios based on past 12-month cumulative returns. The stocks having positive (negative) prior returns during the formation period t-12 to t-1 are categorized as winner and loser stocks. $LMW_{i,t}$ represents contrarian returns for country i at time t, calculated as the difference in return between the equally weighted loser and winner portfolio. Winners, losers and contrarian return series are regressed with various macroeconomic predictors with control variables of market state (MKT) and volatility (VOL). MKT denotes the past twelve-month return of market and VOL represents the past 12-month volatility of stock market. +Vol(-Vol) denote volatility if the market return over the prior twelve-month is positive(negative). The macroeconomic predictors include three-month treasury rate (3M-INT), local currency to USD exchange rate (EXC), Consumer price index (CPI), Industrial production index (IPI), Balance of trade (BOT), and Oil returns (OIL). In parentheses are the values of robust t-statistic that are adjusted for heteroskedasticity and autocorrelation based on Newey (1987). *, ** and *** denote the significance level at 10, 5 and 1 percent, respectively.

Table 4.11: Robustness checks with other global predictors

MKT	VOL	3M-INT	EXC	CPI	IPI	BOT	OIL	GOLD	MSCI	VIX	Ad. R^2
Panel A: Stock market volatility measured over past twelve months											
-0.0154** (-2.33)	0.4534*** (8.07)	0.2240*** (4.85)	0.0356 (0.07)	-0.1896 (-0.39)	0.0289 (0.99)	-0.2798 (-1.54)	0.0134 (1.20)	0.0591 (1.16)			0.056
-0.0152** (-2.49)	0.4739*** (6.73)	0.2376*** (4.22)	0.1561 (0.29)	-0.1952 (-0.41)	0.0374 (1.26)	-0.3198** (-2.08)	-0.0115 (-0.56)		0.1690*** (2.73)		0.062
-0.0097 (-0.87)	0.3809*** (3.11)	0.2272*** (4.95)	-0.0219 (-0.04)	-0.1696 (-0.35)	0.0243 (0.97)	-0.3073** (-2.07)	0.0258 (1.39)			0.0522 (1.13)	0.057
-0.0105 (-0.94)	0.3812*** (3.24)	0.2228*** (5.37)	0.0022 (0.00)	-0.1669 (-0.35)	0.0271 (0.97)	-0.2843* (-1.79)	0.0223 (1.21)	0.0508 (1.00)		0.0477 (1.07)	0.058
-0.0040 (-0.41)	0.3051*** (2.84)	0.2338*** (4.94)	0.1822 (0.36)	-0.1360 (-0.30)	0.0427 (1.23)	-0.3093* (-1.67)	-0.0093 (-0.50)	0.0431 (0.74)	0.2593*** (9.85)	0.1109*** (3.15)	0.073
Panel B: Stock market volatility measured over past six months											
-0.0057*** (-3.07)	0.4461*** (6.29)	0.2439*** (3.53)	0.0076 (0.02)	-0.2007 (-0.42)	0.0267 (0.99)	-0.2526 (-1.22)	0.0110 (0.87)	0.0627 (1.43)			0.058
-0.0087*** (-2.93)	0.4550*** (5.86)	0.2548*** (3.42)	0.1215 (0.23)	-0.2017 (-0.43)	0.0343 (1.22)	-0.2921* (-1.63)	-0.0124 (-0.59)		0.1641*** (2.71)		0.063
0.0026 (0.41)	0.3672*** (3.55)	0.2426*** (4.00)	-0.0553 (-0.10)	-0.1783 (-0.37)	0.0221 (0.93)	-0.2840* (-1.66)	0.0257 (1.48)			0.0665** (1.99)	0.060
0.0021 (0.37)	0.3692*** (3.60)	0.2387*** (4.12)	-0.0310 (-0.06)	-0.1758 (-0.37)	0.0249 (0.96)	-0.2612 (-1.34)	0.0221 (1.25)	0.0514 (1.16)		0.0623* (1.92)	0.061
0.0044 (0.71)	0.3094*** (3.29)	0.2429*** (4.37)	0.1577 (0.32)	-0.1467 (-0.32)	0.0409 (1.22)	-0.2859 (-1.42)	-0.0106 (-0.54)	0.0450 (0.86)	0.2581*** (7.36)	0.1170*** (5.16)	0.077

Notes – This table provides the results of regression Eq. 4 ($LMW_{i,t} = \alpha + \beta x_{i,t-1} + \varepsilon_{it}$) with additional global predictors. At the end of every month (t), the stocks are classified into winners and losers portfolios based on past 12-month cumulative returns. The stocks having positive (negative) prior returns during the formation period t-12 to t-1 are categorized as winner and loser stocks. $LMW_{i,t}$ represents contrarian returns for country i at time t, calculated as the difference in return between the equally weighted loser and winner portfolio. MKT denotes the past twelve-month return of market and VOL represents the past 12-month volatility of stock market. +Vol(-Vol) denote volatility if the market return over the prior twelve-month is positive(negative). The predictors include three-month treasury rate (3M-INT), local currency to USD exchange rate (EXC), Consumer price index (CPI), Industrial production index (IPI), Balance of trade (BOT), Oil returns (OIL), Gold returns (GOLD), world market equity returns (MSCI), and global market volatility (VIX). Panel A and B respectively provide the findings on the basis of past twelve-month and 6-month market volatility. In parentheses are the values of robust t-statistic that are adjusted for heteroskedasticity and autocorrelation based on Newey (1987). *, ** and *** denote the significance level at 10, 5 and 1 percent, respectively.

For robustness of above findings, the study conducts similar regressions with some additional global risk proxies in order to confirm the persistent of above highlighted as well as additional global risk factors. These additional global predictors include Gold returns, Morgan Stanley Capital International (MSCI), and CBOE Volatility Index (VIX). Gold return is used to account for the global risk expectations since gold is regarded as safe haven under the negative or down-market conditions. MSCI return is the proxy of world market index, and it measures the impact of global equity price movements on the profitability of reversals in emerging markets. VIX is a proxy of global market volatility, and it is used to analyze the impact of global market volatility on the profitability of contrarian strategy payoffs. The study utilizes 6-month and 12-month volatility factors in order to deeply analyze the effect of both short-term and long-term volatility conditions. The results are reported in Table 4.11.

Panels A and B present the predictability of macroeconomic and additional global factors with volatility factors measured over past twelve-month and six-month. After controlling the effect of additional global risk factors, 3M-INT and BOT still show significant predictability towards the returns of contrarian portfolios. Interestingly, however, MSCI shows persistent and significant predictive power towards the contrarian returns, which indicates strong correlation of global stock price variations with reversals in emerging stock markets. One possible explanation could be that foreign investors move to other international markets in search of higher returns and leave their positions in high quality (winner) stocks in emerging markets, which may lead to poor performance of past winner stocks and subsequently raise opportunity for contrarian returns in selected sample of emerging markets. The effect of VIX is only significant when the effect of MSCI is controlled in the model (see the coefficients of MSCI returns and VIX in the last rows of Panels A and B). It implies that there is some link between world market return and world market volatility benchmarks. Both create

significant positive association with contrarian strategy payoffs. However, why VIX does not contain idiosyncratic predictability rather possesses predictive capability while controlling for MSCI returns is still a puzzle. Moreover, it is a valuable question to examine whether the regional macroeconomic factors such as IPI, 3M-INT, and BOT are the significant predictors of reversals in other contrarian-driven emerging markets.

4.4 Conclusion

This study examined the predictive ability of various stock-specific and industry related characteristics as well as macroeconomic and global factors over the profitability of contrarian returns in the context of emerging markets. In the empirical analysis, this study focused on South Asian emerging stock markets as these markets are relatively young and some idiosyncratic phenomena characterize these markets, which produce unique institution for contrarian strategy returns. These emerging markets offer a unique set of market characteristics that relate contrarian and momentum profits to macroeconomic and global risk factors and provide important insights by interacting with local market conditions and volatility factors. Furthermore, these markets have undergone economic transformations over the past 20 years, which reduced the trade barriers and increased the foreign investors' participation in these markets. Overall, this study provides unique insights into the prediction of reversals in the context of emerging markets by examining the predictive ability of various firm-specific and industry-related characteristics, as well as macroeconomic and global factors over contrarian strategy payoffs.

The empirical findings show that both firm-specific factors such as liquidity and market value have significant predictability over contrarian strategy payoffs. The stocks that fall in lowest trading-volume and lowest market value quartiles generate highest contrarian returns for investors. Also, the past winner portfolios in lowest volume and lowest market capitalization groups experience greater short-term reversals in

subsequent periods. These results support the argument of Lee and Swaminathan (2000) who claim that trading volume contains information content. Winner stocks with higher trading volume face greater information asymmetry; therefore, overinvestment in these stocks may lead to significant short-term reversals in subsequent periods. Next, this study finds that investors can earn superior returns by carefully forming industry portfolios. The study confirms that the industries which have lower returns in the past outperform the other industries in subsequent periods. Interestingly, the industry-neutral contrarian portfolios yield highest contrarian returns, implying that investors can increase their profits by focusing on specific industry at a time and forming the winner and loser portfolios within the same industry. The study further noted that industry contrarian returns are higher during the periods of Asian and global financial crisis. However, industry momentum returns were mainly observed during non-crises periods, particularly after the period of global financial crisis due to the greater momentum for winner industries. These results corroborate the underreaction theory of Grinblatt and Han (2005) in which winner portfolios exhibit larger momentum following a down market trend. Overall, the findings of this section demonstrate that the relevance and significance of industry characteristics cannot be ignored in interpreting the anomaly returns, and industry component should be considered while pricing various assets.

Finally, the results relating to the predictability of macroeconomic and global risk factors reveal that Industrial production index (IPI), Balance of Trade (BOT), and three-month interest rate (3M-INT) are the prominent macroeconomic factors that show significant predictive ability over loser portfolios and contrarian strategy payoffs. The predictive power of these local macroeconomic factors persists even after controlling for the impact of global risk proxies. In contradiction with Demirer et al. (2017), oil return is not a robust predictor for contrarian strategy payoffs in South Asian emerging stock markets rather some local and regional factors show more predictive ability. The

analysis based on additional global predictors reveals that variation in global market returns (MSCI index) predicts the variability of returns in contrarian payoffs, implying the strong correlation of global stock price movements with the returns of contrarian strategy in emerging stock markets. The global market volatility measured thorough VIX is only significant when the impact of MSCI is controlled in the model. Future research can further explore why VIX does not contain idiosyncratic predictability but possesses predictive capability when MSCI returns are controlled for. Moreover, some other factors and criteria of classifying stocks can be considered while predicting the momentum and contrarian returns. Overall, the findings of current study offer an important implication to investors and fund managers that contrarian strategy with value stocks, conditional on firm, industry, and macroeconomic factors, can yield superior returns in South Asian emerging stock markets. These findings are particularly important in emerging market context because these markets mostly exhibit lower returns for conventional momentum strategies.

CHAPTER 5: FINANCIAL LIBERALIZATION AND THE BEHAVIOUR OF REVERSALS IN EMERGING MARKET ECONOMIES

5.1 Introduction

Momentum and contrarian investment strategies are the two stock market anomalies that are always considered as tricky to be fully explained by the Efficient Market Hypothesis (EMH). The contrarian strategy bucks against current market trends as contrarian investors usually search for distressed stocks and short the existing stock market trends in a bull market. A number of studies document the success of reversal or contrarian investment strategy across geographical and temporal dimensions (DeBondt & Thaler, 1985; Griffin et al., 2003; Locke & Gupta, 2009; Asness et al., 2015; Yu et al., 2019). Neither the proponents of EMH (Fama, 1970, 1991; Fama & French, 1996, 2012) nor the behavioral school of finance (DeBondt & Thaler, 1985, 1987; Jegadeesh & Titman, 1995; Barberis et al., 1998; Daniel et al., 1998; Hong & Stein, 1999) can provide a satisfactory explanation to interpret this anomaly. For example, Fama and French (1993, 2017) tried to link the abnormal profits of the anomaly with time-variant market risk factors but they reveal that the proposed factor models cannot fully explain the anomaly.

The latest research is focusing on identifying various factors that can interpret the time-varying change in contrarian payoffs and subsequent returns of past loser and winner stocks. The studies relate contrarian payoffs to market risk factors (Stivers & Sun, 2010; Kadan & Liu, 2014; Wang & Xu, 2015; Daniel & Moskowitz, 2016; Munir et al., 2020), business cycles (Chordia & Shivakumar, 2002), and macroeconomic or country-specific variables (Liew & Vassalou, 2000; Gregory et al., 2003; Parikakis & Syriopoulos, 2008; Breloer et al., 2014; Shi & Zhou, 2017; Ikizlerli et al., 2019). Gregory et al. (2003) argue that contrarian abnormal returns in the UK persist even after

controlling for GDP, consumption and the investment growth level. Similarly, Parikakis and Syriopoulos (2008) show that a contrarian strategy can be used in all currency markets for profitable investments. Recent studies further highlight the importance of macroeconomics in understanding the contrarian anomaly. Shi and Zhou (2017) find that the lower macroeconomic uncertainty is related to higher contrarian profitability. Ikizlerli et al. (2019) claim that GDP and unemployment rates are useful in explaining contrarian profits.

Financial market liberalization can also affect the profitability of stock selection strategies (Groot et al., 2012), although its impact is unknown a priori. There are two schools of thought about the impact of financial liberalization on the returns of stock selection strategies. On the one hand, liberalization may enhance the stock price efficiency through more openness, which can reduce the scope of higher returns for stock selection strategies. On the other hand, it is sometimes argued in the literature that the imperfections are found mostly in integrated international stock markets as compared to domestic (segmented) capital markets due to the severe information asymmetry problem. Despite the importance of the topic, it has been neglected in the literature on the role of this macroeconomic variable on the contrarian investment strategy's profitability. Many empirical studies focus only on the relationship of financial liberalization with market returns, cost of capital and volatility (Bekaert & Harvey, 2000; Bae et al., 2004; Chari & Henry, 2004; Bekaert et al., 2005; Moshirian, 2007; Muñoz et al., 2020).

This study constructs a daily dataset sample from 1997 to 2017 for eight Asia-Pacific emerging markets i.e., China, India, Indonesia, Korea, Malaysia, Pakistan, Philippines and Thailand and demonstrate that, less liberalized financial markets offer opportunities for investors and fund managers to produce abnormal contrarian returns that cannot be earned through other conventional investment strategies. On the contrary, markets with

higher degree of financial liberalization offer fewer opportunities for investors to generate abnormal contrarian returns. The linkage potentially arises from the investor-base broadening argument that higher financial market liberalization leads to more openness and efficiency of stock prices, hence reduces the scope of returns for different investment strategies (Merton, 1987; Wang, 2007).

The study starts the analysis by dividing the sample of emerging markets into most- and least-liberalized groups based on four different measures of the degree of financial market liberalization. The study then investigates the association between contrarian returns and financial liberalization with binary modelling considering that there are two schools of thought about the impact of financial liberalization on stock markets. On the one hand, financial liberalization process is treated as a one-time event (Foerster & Karolyi, 1999; Kim & Singal, 2000; Chari & Henry, 2004; Umutlu, Salih, et al., 2010). On the other hand, it is argued that financial market liberalization is a time-varying phenomenon, where the speed and implementation of the liberalization differs, depending on local market conditions (Bekaert & Harvey, 2002; Edison & Warnock, 2003; Bae et al., 2004). Since the sample of emerging Asia-Pacific markets in this study exhibits a gradual change in financial market liberalization process, it allows us to test the impact of one-time (identical) and time-varying (partial and complete) natures of financial liberalization on contrarian returns.

This paper has two main contributions. The first contribution is the use of various measures of the degree of financial liberalization and binary modelling analysis to uncover the ambiguous relationship between financial liberalization and contrarian investment strategy. By doing so, the study shows that varying degrees of financial liberalization help to explain the presence of contrarian profits in emerging markets. Secondly, along with contributing to the academic literature, the results of the current research guide regulators and policymakers in policy implication. For instance, in the

case of a positive effect of financial liberalization, the government can remove restrictions on foreign equity investment to safeguard market efficiency through raising the quality of public information, especially in the case of emerging markets. The impact of financial liberalization on trading strategy returns is also relevant for portfolio managers to consider since higher or lower trading strategy returns due to varying degrees of financial liberalization can provide them different evaluation matrices in order to adjust their overall portfolio risk and return profiles.

5.2 Data and Methodology

5.2.1 Data

The main data sources used in this research are Thomson and Reuters Datastream and the International Monetary Fund's (IMF's) "External Wealth of Nations" Database. The daily dataset consists of all the stocks listed on selected emerging markets: Bursa Malaysia, Shanghai Stock Exchange, Bombay Stock Exchange, Indonesia Stock Exchange, Pakistan Stock Exchange, Stock Exchange of Thailand, Philippines Stock exchange and Korea Exchange. The sample period extends from 1997 to 2017. The study excludes the shares of REITs, delisted stocks, investment trusts, and the stocks that have inconsistent data to mitigate the impact of inactive and small stocks. This procedure also helps us to maintain the sample of stocks which usually eliminates the least liquid stocks. The study uses daily stock returns data to form contrarian portfolios at the formation period and calculate portfolio returns at subsequent holding periods. The main index of every market is utilized as the market risk proxy, which is further used to calculate the variables of market state and volatility for our panel regression.

The study employs several measures to proxy the degree of financial liberalization. The literature divides these measures into two categories: capital flow-based and restriction-based measures. Each of the groups has its advantages and disadvantages.

The advantage of using restriction-based liberalization measures is that these directly depict the government restrictions. However, the problem with these measures is their inability to exactly quantifying government restrictions. Moreover, capital control measures strongly represent stock market openness, however, they sometimes act as weak exogenous variables. There are four financial liberalization measures that are used in this research. These financial liberalization measures include the Lane & Milesi-Ferretti (LMF) measure proposed by Lane and Milesi-Ferretti (2007), Foreign Equity Liabilities (FEL) measure that is another variant of LMF, Edison and Warnock (EW) measure proposed by Edison and Warnock (2003) and Chinn and Ito (CI) measure proposed by Chinn and Ito (2007). The study applies various measures of the degree of financial liberalization in order to test whether these measures lead to similar or different findings.

LMF represents the total amount of assets and liabilities of a country's foreign equity portfolios and foreign direct investments (FDIs) as a share of its GDP. This is a capital flow-based proxy that reflects the ability of a country to control international cross-border transactions. Another variant of LMF is FEL, which represents the weight of foreign equity liabilities of an economy as a share of its total stock market capitalization. This proxy provides the exact quantification of the openness of local stock markets to foreign equity investors. In order to construct LMF and FEL measures, the study gathers data from the External Wealth of Nations database. The third proxy is the Edison and Warnock (2003) measure, which is a restriction-based measure and is calculated as the proportion of SP/IFC investible index to SP/IFC global index. The study developed this index by following the index construction methodology proposed by S&P. The results of this measure range from 0 (fully inaccessible to foreign investors) to 1 (fully accessible to foreign investors). The final measure to proxy for financial liberalization is the (Chinn & Ito, 2007, measure (CI)), which measures the

extent of openness of an economy based on the IMF's information from Annual Report on Exchange Arrangements and Exchange Restrictions (AREAER). This is a binary coding-based measure that takes higher values for the economy with lower foreign capital restrictions.

5.2.2 Methodology

The study uses daily stock returns data to classify winner and loser stocks. Specifically, on each day, t, we rank all the stocks based on their prior 264 days (approximately 12 months) cumulative returns. Over the ranking period (t-264) to (t-1), stocks with the top (bottom) 20% of past cumulative average returns constitute the winners (losers) portfolios.[4] Following Asness (1994), the study skips a most recent day while forming the contrarian strategy to avoid the issues related to microstructure such as bid-ask spread, trading costs and liquidity biases. After forming the equally weighted portfolios of winners and losers at the end of each day (t), the study then holds the portfolios for the next 22 days (approximately one month) and calculates the (t+22) days holding period return for every portfolio. Through implementing a contrarian strategy by longing the past losers and shorting the past winners, the study computes contrarian payoffs (LMW), which represent the return difference between the losers and the winners' portfolios over (t+22) days holding period.

After computing the daily time-series of contrarian payoffs, the study moves further towards the estimation procedure with a panel regression setting which follows Umutlu, Akdeniz, et al. (2010). The study regresses the time series of contrarian payoffs ($logLMW_{it}$) on various measures of the degree of financial liberalization with control

[4] This method of portfolio formation is consistent with many existing studies in the literature: (Wang & Xu, 2015; Chen et al. 2016).

variables of market state, volatility, crisis periods and country-specific effects in panel regression settings:[5]

$$\boldsymbol{logLMW_{it} = \alpha + \beta_1 Finlib_{it} + \beta_2 MKT_{it} + \beta_3 VOL_{it} + \beta_4 AsianCrisis_t + \beta_5 GlobalCrisis_t + country_{it} + \varepsilon_{it}} \quad \textbf{(5.1)}$$

$Finlib_{it}$ represents the country related measure of the degree of financial liberalization (EW, FEL, LMF, CI) in time t. These measures are frequently used in subsequent analyses and are the focus of interest in this research. Wang and Xu (2015) and Demirer et al. (2017) find that market state and volatility may exhibit different explanations towards time-variation in momentum or contrarian payoffs. With this in mind, the study includes market state (MKT_{it}) and volatility (VOL_{it}) as control variables. MKT_{it} is the past three-years returns on the value-weighted stock market index of each country at time t. Vol_{it} is the lagged one-year volatility of the stock market index of each country at time t, calculated based on the standard deviation of index return with daily frequency. Given that our sample period covers two main crises: the Asian crisis and the global financial crisis and keeping in mind the possible effect of these crises' periods on contrarian payoffs, the study adds time dummies in the model to account for the effect of crises periods. $AsianCrisis_t$ is a dummy variable of the Asian financial crisis which occurred between 1998 to 1999. It takes the value 1 for all the countries during 1st Jan. 1998 to 31st Dec. 1999, while zero otherwise. $GlobalCrisis_t$ which occurred from 2007 to 2009 takes the value one for all the countries during 1st Oct. 2007 to 30th Sep. 2009, while zero otherwise. $Country_{it}$ is the country-specific dummy variable that accounts for the unobserved country effect on contrarian payoffs.

[5] To make the distribution of dependent variable approximately normal, we apply logarithmic transformation of monthly contrarian payoffs.

5.3 Empirical Results

5.3.1 Profitability of contrarian strategy in Asia-Pacific emerging markets

Before testing the formal regression equation described above, the study first conducts various preliminary analyses to confirm the existence of contrarian effect in selected emerging markets. Table 5.1 reports the excess returns to the winners, losers and contrarian portfolios over the whole sample period (January 1997 through December 2017). Table 5.2 provides the results during the Asian financial crisis (January 1998-December 1999) and global crisis (October 2007- September 2009). Mean returns and risk-adjusted (CAPM-based) returns are presented in the form of a percentage.

The results reported in Table 5.1 verify the existence of the contrarian effect in all the emerging markets. The mean raw (risk-adjusted) returns are significantly positive for all the eight sample countries, with the highest mean (risk-adjusted) contrarian returns in India 4.89% (4.87%) and lowest in South Korea 0.087% (0.075%). The higher contrarian effect in the Indian stock market is mainly due to the overreaction of past loser stocks. we can observe from the results reported in Table 5.1 that during the holding period, the returns of winner stocks are negative, but the returns of loser stocks are positive and highly significant. Upon investigating through Fama and French three factor model in Table 3.4 of essay 1, the value factor was slightly higher and significant, which indicates that the higher book to market stocks that were undervalued or depressed during the formation period (due to recession, crisis or any other reason) significantly gain during testing or holding period when the market corrects the prices of undervalued or overvalued stocks.

Table 5.1: Profitability of the contrarian strategy

Full sample (January 1, 1997-December 31, 2017)

Country		Winner	Loser	Contrarian (LMW)
China	Mean return	-0.504***	0.984***	**1.488*** **
		(-3.89)	(7.07)	**(17.98)**
	Risk-adjusted return	-0.518***	0.968***	**1.482*** **
		(-4.01)	(6.97)	**(17.91)**
India	Mean return	-1.740***	3.151***	**4.891*** **
		(-12.89)	(22.49)	**(40.43)**
	Risk-adjusted return	-1.763***	3.115***	**4.874*** **
		(-13.07)	(22.38)	**(40.39)**
Indonesia	Mean return	-0.270**	0.954***	**1.224*** **
		(-2.57)	(5.58)	**(9.06)**
	Risk-adjusted return	-0.296***	0.898***	**1.190*** **
		(-2.82)	(5.31)	**(8.90)**
Malaysia	Mean return	-0.755***	-0.080	**0.675*** **
		(-7.14)	(-0.49)	**(6.22)**
	Risk-adjusted return	-0.765***	-0.092	**0.668*** **
		(-7.25)	(-0.56)	**(6.16)**
Pakistan	Mean return	-0.102	2.229***	**2.331*** **
		(-0.99)	(18.81)	**(23.51)**
	Risk-adjusted return	-0.130	2.192***	**2.317*** **
		(-1.27)	(18.59)	**(23.40)**
Philippines	Mean return	-0.971***	1.273***	**2.244*** **
		(-8.63)	(8.24)	**(17.33)**
	Risk-adjusted return	-0.987***	1.240***	**2.222*** **
		(-8.80)	(8.11)	**(17.31)**
South Korea	Mean return	-0.584***	-0.496***	**0.087**
		(-4.61)	(-3.08)	**(0.87)**
	Risk-adjusted return	-0.596***	-0.516***	**0.075**
		(-4.71)	(-3.21)	**(0.76)**
Thailand	Mean return	0.112	0.519***	**0.407*** **
		(1.02)	(3.69)	**(3.84)**
	Risk-adjusted return	0.098	0.494***	**0.391*** **
		(0.90)	(3.55)	**(3.72)**

Notes: This table provides the results of country-specific contrarian returns over the whole sample period (From January 1997 to December 2017). Based on the prior 264 days returns with the skip of the most recent day (t), the overall stocks are grouped into loser and winner portfolios at the close of each trading day (t). The stocks having positive (negative) prior cumulative returns over (t-264) to (t-1) days formation period are sorted into winners (loser) portfolios. Contrarian returns are the subsequent returns calculated as the holding period (t+22) days return difference between the equally weighted loser and winner portfolios (LMW). Risk-adjusted returns are the CAPM-alpha. The values of robust t-statistic are provided in parentheses that are adjusted for heteroskedasticity and autocorrelation based on Newey (1987). ** and *** denote the significance level at 5 and 1 percent, respectively.

Table 5.2: Contrarian returns during crisis periods

Crisis Periods (Jan. 1998 – Dec. 1999 and Oct. 2007 – Sep. 2009)				
Country		**Winner**	**Loser**	**Contrarian (LMW)**
China	Mean return	-1.403***	1.029***	**2.432*** **
		(-4.07)	(2.78)	**(12.36)**
	Risk-adjusted return	-1.401	1.032***	**2.427*** **
		(-4.03)	(2.79)	**(12.32)**
India	Mean return	-2.170***	4.070***	**6.240*** **
		(-8.82)	(12.74)	**(26.26)**
	Risk-adjusted return	-2.197***	4.018***	**6.208*** **
		(-8.91)	(12.76)	**(2.93)**
Indonesia	Mean return	-1.460***	4.491***	**5.951*** **
		(-4.71)	(6.46)	**(10.88)**
	Risk-adjusted return	-1.501***	4.369***	**5.863*** **
		(-4.85)	(6.37)	**(10.86)**
Malaysia	Mean return	-1.838***	2.452***	**4.291*** **
		(-5.60)	(4.22)	**(10.58)**
	Risk-adjusted return	-1.855***	2.435***	**4.283*** **
		(-5.66)	(4.19)	**(10.53)**
Pakistan	Mean return	-2.662***	1.826***	**4.488*** **
		(-11.86)	(5.39)	**(12.90)**
	Risk-adjusted return	-2.660**	1.837***	**4.491*** **
		(-11.86)	(5.43)	**(12.89)**
Philippines	Mean return	-1.993***	3.649***	**5.643*** **
		(-8.06)	(6.19)	**(11.85)**
	Risk-adjusted return	-2.000***	3.641***	**5.635*** **
		(-8.12)	(6.26)	**(12.00)**
South Korea	Mean return	-2.011***	-0.094	**1.916*** **
		(-5.67)	(-0.17)	**(5.57)**
	Risk-adjusted return	-2.044***	-0.164	**1.872*** **
		(-5.78)	(-0.30)	**(5.48)**
Thailand	Mean return	-2.335***	2.130***	**4.466*** **
		(-7.23)	(3.98)	**(11.79)**
	Risk-adjusted return	-2.356	2.087***	**4.437*** **
		(-7.34)	(3.97)	**(11.88)**

Notes: This table reports the findings of country-specific contrarian returns for the Asian Crisis (from Jan. 1998 to Dec. 1999) and global crisis (from Oct. 2007 to Sep. 2009) consisting of 48 months. Based on the prior 264 days returns with the skip of the most recent day (t), the overall stocks are grouped into loser and winner portfolios at the close of each trading day (t). The stocks having positive (negative) prior cumulative returns over (t-264) to (t-1) days formation period are sorted into winners (loser) portfolios. Contrarian returns are the subsequent returns calculated as the holding period (t+22) days return difference between the equally weighted loser and winner portfolios (LMW). Risk-adjusted returns are the CAPM-alpha. The values of robust t-statistic are provided in parentheses that are adjusted for heteroskedasticity and autocorrelation based on Newey (1987). ** and *** denote the significance level at 5 and 1 percent, respectively.

These findings are also consistent with Locke and Gupta (2009), who find almost similar contrarian returns (i.e., around 3% per month) in Bombay Stock exchange. They associate these higher returns with overreaction phenomenon in the Indian stock market.

On the other hand, in case of the South Korean stock market, the contrarian effect is very weak as shown in Table 5.1. Moreover, we can observe that there is not much difference in the magnitude of returns between loser and winner stock portfolios, indicating the absence of any under or overreaction of stocks. These factors altogether imply that South Korean stock market is relatively more efficient where the probability of anomalous profits is lower possibly due to lower information asymmetries and tight regulatory controls.

Interestingly, the contrarian strategies yield significantly higher profits during crisis periods, more than twice that of the non-crises periods in most of the markets. Table 5.2 reports the returns during the crisis periods, where the highest mean (risk-adjusted) return is again in India 6.24% (6.20%) and lowest in Korea 1.91% (1.87%). Upon analyzing the winner and loser portfolio returns, we can observe that the higher ex-ante expected returns of contrarian strategy during crisis periods are mainly due to the higher payoffs attached to the past losers. These findings comply with the latest results of Daniel and Moskowitz (2016), who state that, specifically in panic and higher volatility states, the momentum investment strategy crashes which is contemporaneous with stock market rebounds. Furthermore, , Blitz et al. (2011) and Mushinada (2020) report similar reversal effects during crisis periods while testing various stock selection strategies on emerging and developed markets.

5.3.2 Country-Neutral Contrarian strategies

There are two types of international stock returns that could produce continuation or reversal effects: country-specific and firm-specific (or country-neutral). Empirical studies including Chan et al. (2000) and Hameed and Kusnadi (2002) suggest that due to the high volatility of Asia-Pacific emerging equity markets, country momentum is hard to find, while firm-specific momentum could easily be found by forming a

geographically well-diversified country-neutral portfolio. Therefore, the study also examines the contrarian returns in a country-neutral global setting. By arranging the stocks into ascending order based on their past 264 days returns, the study forms country-neutral portfolios. The country-specific portfolios are combined to form a country-neutral portfolio in such a way that each stock receives an equal weight. Panel A of Table 5.3 provides the mean (risk-adjusted) returns of country-neutral portfolios with robust t-statistics. The global contrarian strategy earns 1.66% (1.65%) mean (risk-adjusted) return. These results again confirm a strong reversal effect in Asia-Pacific emerging markets, whereas the unreported results show a sharp decrease in the standard deviation of returns due to the diversification effect.

Table 5.3: Contrarian returns for country-neutral portfolios and Most and Least liberalized subsamples

Panel A: Contrarian returns for country-neutral portfolios				
		Winner	**Loser**	**Contrarian (LMW)**
Country-neutral	**Mean Return**	**-0.601***** (-14.58)	**1.066***** (20.08)	**1**.668*** (41.71)
	Risk-Adjusted Return	**-0.619***** (-15.03)	**1.038***** (19.64)	**1.652***** (41.46)

Panel B: Degree of Financial Liberalization and Contrarian Returns			
Measure		**Mean Contrarian Returns (LMW)**	**Risk-Adjusted Contrarian Return**
EW	Most Liberalized	**1.145***** **(5.49)**	1.136*** (5.14)
	Least Liberalized	**2.192***** **(7.60)**	2.179*** (6.36)
LMF	Most Liberalized	**0.865***** **(5.76)**	0.853*** (5.45)
	Least Liberalized	**2.858***** **(13.56)**	2.846*** (11.36)
FEL	Most Liberalized	**1.210***** **(4.26)**	1.197*** (3.93)
	Least Liberalized	**2.513***** **(9.98)**	2.502*** (9.79)
CI	Most Liberalized	**1.370***** **(4.85)**	1.355*** (4.51)
	Least Liberalized	**1.874***** **(10.15)**	1.866*** (9.88)

Notes: This table provides the contrarian returns for country-neutral as well as most and least liberalized portfolios that are formed based on the different measures (EW, LMF, FEL and CI) of the degree of financial liberalization. For country-neutral portfolio formation in Panel A, we make country-neutral contrarian portfolios by arranging the stocks in our universe of countries into ascending order based on their past 264 days performance. For the formation of most and least liberalized groups in Panel B, the study arranges all countries in ascending order based on different measures of the degree of financial liberalization at the end of each day (t). The study decides thresholds to divide the countries into most and least liberalized groups in such a way that each group approximately contains the same number of stocks. The study then separately forms the winner and loser portfolios on most and least liberalized stocks and calculates contrarian returns (LMW) for each group. The definition of contrarian returns is the same as in Table-5.1. Risk-adjusted returns are the CAPM-alpha. The values of robust t-statistic are provided in parentheses that are adjusted for heteroskedasticity and autocorrelation based on Newey (1987). *** denote the significance level at 1 percent.

Over the past three decades, the selected sample of emerging markets has undergone several regulatory changes. During the early years, there were more restrictions on the participation of foreign investors in local equity markets in some of the selected sample countries. From the late 1980s onward, foreign equity participation significantly improved in these markets (see, e.g. Bekaert & Harvey, 1997; Bekaert & Harvey, 2000). However, the degree of financial liberalization has varied across sample countries during our study period. Therefore, stock market liberalization may also impact the profitability of contrarian strategy, although the effect is unknown a priori. The study then moves to analyze the behavior of contrarian returns during the time-varying change in the degree of financial liberalization.

5.3.3 Contrarian returns and the degree financial market liberalization

In order to test the effect of financial liberalization, the study divides the sample of emerging markets into most and least liberalized groups based on each of the financial market liberalization index (FEL, EW, LMF and CI) explained in the methodology section. By following Groot et al. (2012), the study arranges all the countries in ascending order based on each measure of the degree of financial liberalization. The study decides thresholds to divide the countries into most and least liberalized groups in a way that each group approximately contains the same amount of stocks. The study then separately forms the portfolios based on the most and least liberalized stocks. Table

5.3, Panel B, presents the contrarian returns of most and least liberalized sub-samples. The results based on all the liberalization measures show a consistent trend that contrarian returns are higher for least liberalized portfolios and lower for most liberalized portfolios, which proves the study hypothesis 3_A. On the other hand, countries with higher degree of financial liberalization yield lower contrarian returns, which supports the study hypothesis 3_B. Our key findings in this section show that the higher degree of financial liberalization in selected emerging markets leads to lower abnormal returns for stock selection strategies. These findings are somehow consistent with Groot et al. (2012) whose 12-month MOM strategy yields similar results based on Heritage Foundation (HF) and Fraser Institute's (EFW) measures of financial liberalization.

5.3.4 Incorporating transaction costs

In this section, the study attempts to show the impact of transaction cost on contrarian strategy returns in selected emerging markets. As compared to developed equity markets, the liquidity in frontier and emerging equity markets remains low; therefore, incorporation of actual transaction costs into pricing would refine the profitability of investing strategies in the presence of actual stock market imperfections. This section specifically examines the question whether the proposed nexus between the degree of financial liberalization and contrarian strategy returns holds when the transaction costs incorporated in stock prices. The study applies the model of Marshall et al. (2011) and Groot et al. (2012), which is considered more robust for frontier and emerging markets by keeping in mind the characteristics of these markets. In line with the above studies, this study considers bid-ask spread as transaction costs. The data is collected from Thomson and Reuters Datastream. The most recent month is skipped between the portfolios formation and holding periods in order to control the impact of bid-ask bounce and other relevant costs.

The results are reported in Appendix C. As shown in Table C.1, contrarian strategies adjusted with transaction cost still yield positive and significant returns for all the countries except for India, and Pakistan. However, the magnitude and significance levels of returns are lower as compared to gross returns. Consistent with the prior findings, contrarian strategies produce higher returns during crisis periods as reported in Table C.2, where the highest net returns are associated with the Indonesia (4.08%) and lowest with the India (0.40%). The comparison of returns between the winner and loser portfolios reveal that the higher ex-ante expected returns of the contrarian strategy during crisis periods are mostly attributable to the higher payoffs associated with prior losers. The loser portfolios of stocks experience greater return reversals during post crisis periods and generate higher positive payoffs.

Panel A of Table C.3 provides the gross and net returns of country-neutral portfolios with robust t-statistics. The global contrarian strategy earns 0.34% monthly returns after adjustment of transaction costs. The study also examines the effect of the degree of financial liberalization on contrarian strategy returns based on the transaction cost adjusted prices. As explained earlier, the study divides the sample of emerging markets into most and least liberalized groups based on each of the financial market liberalization index (FEL, EW, LMF and CI). The study decides thresholds to divide the countries into most and least liberalized groups in a way that each group approximately contains the same number of stocks. The study then separately forms the portfolios based on the most and least liberalized stocks. Panel B of Table C.3 reports the contrarian returns of most and least liberalized sub-samples. In case of EW measure of the degree of financial liberalization, the least liberalized group generates lower contrarian returns but the results are insignificant. Except for the results of EW measure, the results based on all the liberalization measures show a consistent trend that contrarian returns are higher for least liberalized portfolios and lower for most

liberalized portfolios, which proves the study hypothesis 3_A. On the other hand, countries with higher degree of financial liberalization yield lower contrarian returns, which supports the study hypothesis 3_B. After adjustment of transaction costs, the returns become lower in magnitude, but they do not completely vanish. Therefore, the hypothesis regarding the negative relationship between the degree of financial liberalization and contrarian strategy returns holds even when the transaction costs are taken into account in selected stock markets.

5.3.5 Evidence from panel regressions

After verifying the effect of "financial liberalization" on the profitability of contrarian strategy, the study then performs various panel regression models and formally examines the effect of the degrees of financial liberalization on time-varying contrarian payoffs. Under the set of some control variables like market state, volatility, crises periods and country fixed effects, the study regresses $\log LMW_{it}$ on the degree of financial liberalization in a panel setting. Table 5.4 and 5.5 report descriptive statistics and the results of estimated panel regression (Eq. 5.1), respectively.

In Table 5.4, the study presents the description of winners, losers, contrarian (LMW) portfolios, degree of financial liberalization variants and control variables. For each country, the table provides the time-series averages of every variable. The rows at bottom of the table present the summary statistics of the entire sample. From the sample of our emerging countries, Malaysia, Thailand, Indonesia China and Korea are the most liberalized in terms of the FEL and LMF measures as these have higher values than the overall sample average. India, Indonesia, Malaysia, Thailand and Philippines represent higher than sample average for EW measure. Finally, Philippines, Malaysia, Korea and Indonesia are more open economies with respect to capital account restrictions (CI). The time-series averages of winners, losers and contrarian (LMW) factors have already

been discussed with detail in previous sections. For control variables, Korea shows the highest volatility share with a mean level of 0.823, while the Pakistan stock market has the highest share of market state with a positive mean return value of 0.1946.

Table 5.4: Descriptive Statistics

Country	Winner	Loser	Contrarian (LMW)	FEL	LMF	EW	CI	MKT	Volatility
China	-0.504	0.984	1.488	0.120	0.310	0.760	-1.210	0.0887	0.802
India	-1.740	3.151	4.891	0.080	0.229	0.916	-1.210	0.1315	0.767
Indonesia	-0.270	0.954	1.224	0.171	0.257	0.857	0.670	0.1388	0.717
Malaysia	-0.755	-0.080	0.675	0.165	0.950	0.870	-0.238	0.0416	0.473
Pakistan	-0.102	2.229	2.331	0.071	0.121	0.741	-1.244	0.1946	0.669
Philippines	-0.971	1.273	2.244	0.107	0.311	0.917	-0.240	0.0718	0.645
South Korea	-0.584	-0.496	0.087	0.033	0.433	0.823	0.352	0.0821	0.823
Thailand	0.112	0.519	0.407	0.256	0.578	0.929	-0.664	0.0652	0.718
Mean	-0.601	1.066	1.668	0.112	0.399	0.852	-0.473	0.0975	0.662
Std. Dev.	8.257	10.979	8.257	0.088	0.285	0.154	0.862	0.2979	0.255
Minimum	-70.611	-100.726	-41.674	0.001	0.069	0.146	-1.916	-1.136	0.289
Maximum	46.295	109.289	88.242	0.375	1.318	0.998	2.346	1.29.07	1.416

Note: This table provides the descriptive statistics. The averages of time-series of variables for each country are provided in the body of the table. In the bottom rows are the descriptive statistics of the entire sample. The definition of winners, losers and contrarian portfolios is same as in Table-5.1. FEL, LMF, EW, and CI represent the different measures of the degree of financial liberalization. LMF represents the net amount (assets minus liabilities) of country's foreign equity portfolios and foreign direct investment as a share of its GDP. FEL is computed as the amount of foreign equity liabilities of an economy divided by its total stock market capitalization. EW is the proportion of SP/IFC investible index to SP/IFC global index. CI is the capital restriction-based measure developed by Chin and Ito (2007). Market state i.e. MKT_{it} (the lagged average of 792 days / three-year market return) and market volatility i.e. VOL_{it} (the past 264 days / twelve-month average market return volatility) are the control variables. Country specific dummy variables are added to control the country level fixed effect. MKT_{it} and VOL_{it} are added in the model to control the effects of varying market state and volatility on contrarian payoffs.

Table 5.5 reports the results of regression Eq. 5.1, described in the methodology section. In table 5.5, every column presents the results of a separate regression run by using each measure of the degree of financial liberalization (FEL, EW, LMF, CI). The study includes country-specific dummies in each specification but does not report their estimates. The study finds a consistent and significantly negative impact of financial liberalization on contrarian payoffs in all the regression specifications. These results suggest that the contrarian payoffs decrease with an increase in the degree of financial liberalization. For example, we observe a minimum of 1.78% decrease in contrarian

payoffs with a one-unit increase in the degree of financial liberalization, measured by CI (since the exponential value of 0.017 i.e. Exp(0.017) = 1.0178).

Table 5.5: Regression Results for the effect of financial liberalization on Contrarian Payoffs

FEL	-0.1917***			
	(0.0117)			
EW		-0.0345***		
		(0.0061)		
LMF			-0.0569***	
			(0.0038)	
CI				-0.0177***
				(0.0010)
Market State	0.041***	0.0633***	0.0425***	0.0524***
	(0.0089)	(0.0081)	(0.0089)	(0.0081)
Volatility	0.0061	0.0342***	-0.0050	0.0279***
	(0.0038)	(0.0033)	(0.0040)	(0.0033)
Asian Crisis	0.0707***	0.0652***	0.0730***	0.0633***
	(0.0037)	(0.0035)	(0.0037)	(0.0035)
Global Crisis	0.0499***	0.0407***	0.0543***	0.0451***
	(0.0499)	(0.0033)	(0.0035)	(0.0033)
Country fixed effects	Yes	Yes	Yes	Yes
Ad. R^2	0.0267	0.0223	0.0253	0.0282

Notes: This table provides the results of regression Eq. 5.1. The dependent variable is the log transformation of contrarian returns (LMW). The definition of contrarian returns is the same as in Table-5.1. FEL, EW, LMF and CI represent the different measures of the degree of financial liberalization. Market state (MKT_{it}) and market volatility (VOL_{it}) are the control variables. Country specific dummy variables are added to control the country level fixed effect. AsianCrisis and GlobalCrisis are the time dummies that take the value of one from the days 1st Jan 1998 to 31st Dec. 1999 for Asian financial crisis and from 1st Oct. 2007 to 30th Sep. 2009 for the global crisis. Each column of the table represents the results of a separate regression run with one of the four measures (FEL, EW, LMF and CI) of the degree of financial liberalization. In parentheses are the values of standard errors. *** denote the significance level at 1 percent.

Similarly, we see a maximum decrease of 21.13% in contrarian payoffs with a one-unit increase in the degree of financial liberalization, measured by FEL (since Exp(0.1917) = 1.2113). The signs of market state and volatility factors are consistent with the previous findings in the literature. Along the lines of Demirer et al. (2017), market state has a significant positive effect on contrarian payoffs. Furthermore, consistent with the existing findings of Wang and Xu (2015), volatility exhibits a positive relationship with contrarian payoffs. Both the dummies of the crisis period are

significant and positive, implying that the contrarian returns rise during crisis periods. However, the larger and highly significant coefficients of the Asian financial crisis reveal its more dominant effect as compared to the global crisis. Our findings of decreasing contrarian returns due to the increased degree of financial liberalization is again consistent with the extended investor-base broadening hypothesis.

Table 5.6: Diagnostic test of Panel Estimation

	Essential tests	Chi-SQ	P.Value
FEL	Hausman test	1.36	0.9289
	B & P Test for random effect	0.57	0.44
	Wald test for Heteroskedasticity	1079.39	0.0000
	Panel serial correlation test	51.464	0.0002
EW	Hausman test	2.08	0.8382
	B & P Test for random effect	4.56	0.4195
	Wald test for Heteroskedasticity	874.41	0.0000
	Panel serial correlation test	174.38	0.0000
LMF	Hausman test	8.04	0.1541
	B & P Test for random effect	3.08	0.6
	Wald test for Heteroskedasticity	1109.97	0.0000
	Panel serial correlation test	51.478	0.0002
CI	Hausman test	5.87	0.3195
	B & P Test for random effect	2.36	0.7528
	Wald test for Heteroskedasticity	843.56	0.0000
	Panel serial correlation test	174.40	0.0000

Notes: This table reports the results of various Post Hoc tests. Hausman test is applied to test for the random or fixed effects in the model. The acceptance of the Null Hypothesis of Breusch and Pagan's LM test shows the non-existence of random effects in the model under consideration. Wald test for Heteroskedasticity and Wooldridge test for serial correlation address the possible Heteroskedasticity and serial correlation problems in the model.

Table 5.6 reports the results of post diagnostic tests for panel estimation. Hausman test generally measures the appropriateness between fixed and random effect models. The essence of this test is to analyze the systematic behavior of intercept and error term in the model. Failure to reject the null hypothesis gives sound validation to select the random effect model. But the final decision is made based on the results of Breusch and Pagan's LM test of random effects. The null hypothesis in this test measures the non-existence of the random effect. P-value of this test also accounts for the chances of type

one error and the exact degree of rejection of the hypothesis. The acceptance of the null hypothesis for BP LM test under all the regression specifications in Table 5.6 justifies the non-existence of random effect in the models under consideration. In other words, alternative models of pool or panel estimation rather than random effect are appropriate, which also account for probability and homogeneity. Hence, the panel OLS is plausible deniability on the basis of Hausman and Breusch and Pagan LM tests.

Accuracy and efficiency have an intimate connection with empirical findings. These are accomplished by testing various assumptions of empirical models including heteroskedasticity and serial correlation. The study applies the Wald test of heteroskedasticity and Wooldridge panel serial correlation tests to check these assumptions in our models. Wald heteroskedasticity test measures the equal variance of error term across observation by group-wise sample distribution. Rejection of the null hypothesis in this test suggests no homoscedasticity in the error term. Violation of the assumption of homoscedasticity in the error term will lead to higher standard error estimates, eventually raising objections to hypothesis testing. In addition, serial correlation is also a key problem in long panel time-series data and has several implications. Rejection of the null hypothesis of the Wooldridge serial correlation test suggests the existence of serial correlation in the data. As per the results reported in Table 5.6, the models suffer from both heteroskedasticity and serial correlation. To cope with these problems, the study uses the cluster option in Stata which offers GLS estimation in the presence of heteroskedasticity and autocorrelation issues simultaneously. Therefore, the panel GLS estimation procedure best suits our regression models.

5.4 Binary modelling of financial liberalization

Several emerging countries opened their financial system to foreigners during the late 1980s to early 1990s. Some countries, like Chile, Hungary, Argentina, Poland,

Turkey and South Africa, implemented intense liberalization. These emerging countries have either completely liberalized their stock markets at once, or within few years, they became entirely open to foreign investors. However, the emerging countries in our sample like China, India, Pakistan, Malaysia, Philippines, Thailand, Korea and Indonesia, exhibit a gradual change in their degree of financial liberalization. Despite initial liberalization, some countries did not even show a significant variation in the intensity of capital controls. Most of the studies in existing literature explicitly assume the identical effects of financial liberalization across countries. Nevertheless, given the immense variation in the speed and intensity of the liberalization process among countries (see Table 5.4 for the explanation of various measures of the degree of financial liberalization), it is worthy to obtain the effects of varying nature of stock market liberalization on contrarian payoffs.

In binary modeling analysis, the same set of different measures of the degree of financial liberalization is used. As defined in Table 5.4, these measures include LMF, FEL, EW and CI. The value of each index defines the low, high, or full liberalization in a country. For example, in case of EW, the results of this measure range from 0 (fully inaccessible to foreign investors) to 1 (fully accessible to foreign investors). Similarly, CI measures the extent of openness of an economy based on the IMF's information from Annual Report on Exchange Arrangements and Exchange Restrictions (AREAER). This is a binary coding-based measure that takes higher values for the economy with lower foreign capital restrictions. By using Bekaert and Harvey (2000a, b)[6] official market liberalization dates for our sample countries, this section employs the binary modeling of financial liberalization to examine the effects of different liberalization intensities across countries. The study follows Edison and Warnock's

[6] Bekaert and Harvey (2000a, b) provide the detailed chronology of official liberalization for emerging markets.

(2003) event-window approach, which differentiates partial liberalization from complete liberalization by replacing post-liberalization and after-liberalization dummies with the measures of the degree of financial market liberalization. This procedure relaxes the strict assumption that the various types of liberalizations have an identical impact. This analysis will help in identifying the sequential impact (partial or more complete) of financial liberalization on contrarian returns, in terms of how long it will take for the contrarian strategy returns to reach at a new level subsequent to the initial relaxation of cross-border restrictions. The study uses various periods of post-liberalizations in the model to account the behavior of returns at various levels of the degree of financial liberalization. Finally, as the sample period of this analysis differs from the original sample period, the results of this out of sample analysis provide robustness to our findings reported in previous sections that how the prior findings are time dependent. The sample period varies from country to country in the event-window analysis of stock market liberalization. It begins in March 1987 (for Korea) and ends in May 2009 (for India), which is enough in almost every country to cover the post- and after-liberalization time.

The study adopts the econometric methodology of Edison and Warnock (2003), which differentiates partial liberalization from complete ones. In order to make the results consistent and comparable with prior studies in the literature of financial liberalization, the similar lengths of PRE, DURING, POST, and AFTER are utilized. The same lengths were used by Edison and Warnock (2003) and some other studies for countries based on the official liberalization event dates of Bekaert and Harvey (2000a, b). The study runs two regressions for comparison purposes in this section. The first is a baseline regression which pools all types of liberalizations without differentiating between complete and partial liberalization. In equation 5.2 and 5.3, the event month represents the starting month of liberalization as highlighted by Bekaert and Harvey

(2000a, b). Please see Appendix D to view the complete chronology of financial liberalization for selected sample countries. The explanatory variables in this regression are dummy variables that take the value one in PRE (from 18 to 7 months before the official liberalization event date of Bekaert and Harvey (2000a, b), DURING (from 6 months before to 6 months after the month of liberalization), POST (from 7 to 18 months after the liberalization month), and AFTER (from 12 months after the POST period). The study applies two-, three- and four year's post-period windows for comparison purposes. The regression used is the generalized least square method which accounts for panel-specific serial correlation and heteroskedasticity. The following is the baseline regression model:

$$\boldsymbol{logLMW_{it} = \alpha_i + \beta_1 PRE_{it} + \beta_2 DURING_{it} + \beta_3 POSt_{it} + \beta_4 AFTER_{it} + \varepsilon_{it}} \quad \textbf{(5.2)}$$

The second regression differentiates between partial and complete liberalization by incorporating different measures of degrees of stock market liberalization after the initial relaxation of restrictions:

$$\boldsymbol{logLMW_{it} = \alpha_i + \beta_1 PRE_{it} + \beta_2 DURING_{it} + \beta_3 Finlib_{it} POSt_{it} + \beta_4 Finlib_{it} AFTER_{it} + \varepsilon_{it}} \quad \textbf{(5.3)}$$

Here, $Finlib_{it}$ represents the value of one for the financial market liberalization measures. The second regression is the same version of the previous regression, the only difference is the interaction of financial liberalization measures with the coefficients of $Post_{it}$ and $After_{it}$. These interaction terms will enable us to compare the pre period returns with the periods of the post and after the liberalization.

The findings of both the regression specifications are reported in Table 5.7. The first regression in each panel is the baseline regression (Eq. 5.2) and the remaining regression specifications provide the results of the regression specification (Eq. 5.3), where the different financial liberalization measures interact with the post- and after-period dummies. The length of the post-period window in each panel differs from 2 to 4

years. Various window lengths of post-periods allow us to understand the evaluation of change in contrarian payoffs after liberalization. The reported results of baseline regression (Eq. 5.2) indicate a sharp decrease in contrarian payoffs during the period of initial relaxation of foreign equity restrictions. The contrarian payoffs continue to depreciate in the post and after period of liberalization but at a slower rate. In baseline regressions, the contrarian payoffs change associated with a complete opening is 0.0457, 0.025 and 0.192 (the differences between the coefficients of pre and after in baseline regressions), respectively for the post period windows of 2, 3 and 4 years. Wald test checks whether the difference of the coefficients between Pre-Post and Pre-After are significant. The results of base line regressions in Panels A, B and C of Table 5.7 show that the decrease in contrarian returns between Pre and After periods are significant at 1 percent in all the cases (as the p-values of Wald-test for the difference of Pre and After coefficients of base-line regressions are 0.000, 0.0007 and 0.008 for Panels A, B and C respectively). These results indicate that it takes time for contrarian returns to reach a new level after the initial liberalization is introduced. Furthermore, the results of Wald-test statistics become more pronounced and significant for both Pre-Post and Pre-After coefficients when partial and more complete liberalizations are compared through incorporation of different measures of the degree of financial liberalization in base line regressions.

The findings of partial and full liberalization (Eq. 5.2) provide greater insight into the relationship between contrarian payoffs and degrees of financial liberalization. The significant post-liberalization decrease (relative to pre) for FEL (0.056, 0.248, 0.178 base points)[7], CI (0.049, 0.0098, 0.168 base points) and LMF (0.1218, 0.0381, 0.0312

[7] These values are the differences between the coefficients of pre and post reflecting the net change in contrarian payoffs over the period from pre to post liberalization.

base points) in panel A, B and C suggests that more complete liberalizations are linked with sharp decline in contrarian payoffs. The significant p-vales of Wald test statistic for the difference between pre- and post-liberalization also confirm this trend.

Table 5.7: Binary modelling of financial liberalization and integration of continuous financial liberalization measures into binary modelling

	Pre	During	Post	After	Wald (pre-post)	Wald (pre-After)
Panel-A: The post-period window is 2 years						
Baseline Reg.	0.0190***	0.0185**	0.0013	-0.0267***	0.04	19.78
	(3.21)	(2.50)	(0.20)	(-4.45)	[0.841]	[0.000]
Reg. with FEL	0.0450***	0.0264***	-0.011***	-0.043***	15.02	51.35
	(8.86)	(4.42)	(-5.19)	(-2.95)	[0.0001]	[0.000]
Reg. with EW	0.0359***	0.0545***	0.0434***	0.0289***	1.13	1.15
	(5.75)	(10.07)	(8.83)	(6.49)	[0.288]	[0.283]
Reg. with CI	0.0396***	0.0210***	-0.0094***	-0.0170***	3.31	3.60
	(7.92)	(3.59)	(-4.09)	(-12.54)	[0.069]	[0.057]
Reg. with LMF	0.0468**	0.0282***	-0.075***	0.0155***	14.19	3.69
	(9.24)	(4.74)	(-6.68)	(4.30)	[0.0002]	[0.054]
Panel-B: The post-period window is 3 years						
Baseline Reg.	0.001	-0.0315***	-0.0108***	0.024***	2.69	11.51
	(0.16)	(-5.50)	(-3.06)	(10.21)	[0.101]	[0.0007]
Reg. with FEL	-0.0106	-0.0432***	-0.2598***	-0.0578***	15.44	11.32
	(-1.58)	(-7.67)	(-4.09)	(-4.52)	[0.0001]	[0.0008]
Reg. with EW	-0.0039	-0.0366***	-0.0190***	0.0390	3.72	30.91
	(-0.59)	(-6.46)	(-4.19)	(8.67)	[0.053]	[0.000]
Reg. with CI	-0.0056	-0.3829***	-0.0154***	-0.0337***	2.06	16.98
	(2.39)	(-6.87)	(-8.62)	(-24.68)	[0.151]	[0.000]
Reg. with LMF	-0.0081	-0.0408***	-0.0462***	0.00724	12.61	3.40
	(-1.22)	(-7.23)	(-5.35)	(1.33)	[0.0004]	[0.065]
Panel-C: The post-period window is 4 years						
Baseline Reg.	0.0012*	-0.0314***	0.0572*	0.0191***	0.40	6.90
	(1.71)	(-5.45)	(1.76)	(7.88)	[0.5279]	[0.008]
Reg. with FEL	-0.0108	-0.0435***	-0.0701***	-0.0962***	5.66	17.97
	(-1.62)	(-7.71)	(-5.51)	(-2.71)	[0.017]	[0.000]
Reg. with EW	-0.0048	-0.0374***	0.0406	0.0210***	1.36	10.25
	(-0.72)	(-6.59)	(0.97)	(4.12)	[0.242]	[0.001]
Reg. with CI	-0.0050	-0.0377***	-0.1734***	-0.0386***	3.26	17.46
	(-0.76)	(-6.77)	(-10.81)	(-23.51)	[0.071]	[0.000]
Reg. with LMF	-0.0083	-0.0410***	-0.0229***	-0.0902***	2.25	3.80
	(-1.24)	(-7.25)	(-3.10)	(-5.52)	[0.133]	[0.037]

Notes: This table presents the results of regression Eq. 5.2 and Eq. 5.3. The baseline regression refers to Eq. 5.2, where the dependent variable is the log transformation of the contrary payoffs (LMW), which is regressed with the dummy variables of Pre, During, Post and After periods, as defined in the paper. The regressions in which the various financial liberalization measures (FEL, EW, LMF and CI) interact with the Post and After time dummies reflect Eq. 5.3. Each panel of the table depicts the results for different window lengths of the Post period. The analyses include the sample of those countries that have the official liberalization dates as per Bekaert and Harvey (2000a, b) and have the availability of data for the defined event window. These countries include India, Malaysia, Indonesia, Thailand, Philippines and Pakistan. The values of the t-statistic are provided in parentheses. The values in brackets represent the p-

values of the Wald test for the difference of the coefficients. *, ** and *** denote the significance level at 10, 5 and 1 percent, respectively.

The results of EW liberalization measure are mostly inconclusive. Overall, the negative association between the degrees of financial market liberalization and contrarian payoffs reported in previous sections holds true for binary modeling of financial liberalization, which again supports the extended investor-base broadening hypothesis. Umutlu, Akdeniz, et al. (2010) reach at a similar conclusion but with a different measure of market quality. They measure the effect of financial market liberalization on stock return volatility and conclude that the higher degree of financial liberalization relates to the lower level of stock market volatility due to the reduction in information asymmetry, which in turn leads to enhanced stock price efficiency in emerging markets.

5.4.1 Sub-sampling according to the size of the economy

This section further examines the robustness of earlier findings by examining whether the prior results of regression Eq. 5.1 show any dependence on the size of the country. In order to fulfill the purpose, the study divides the sample countries into two groups based on their GDPs. The four largest GDP countries (China, India, Korea, and Indonesia) constitute the large GDP subsample, and the four lowest GDP countries (Thailand, Malaysia, Philippines, and Pakistan) form the small GDP subsample. The study examines the relationship between contrarian payoffs and the degree of financial liberalization based on two subsamples varying in size by GDP. The results of each sub-sample are provided in panel A and B of Table 5.8. Panel A documents the negative impact of the degree of financial liberalization on contrarian payoffs for small-GDP sub-sample in the case of FEL, LMF and CI. However, the results are statistically

significant for FEL and LMF only (with the coefficients of -0.351 and -0.046, respectively). In panel B, the results depict a strong negative effect of the degree of financial liberalization on contrarian payoffs for large-GDP sub-sample. Here, all the liberalization measures significantly impact the contrarian payoffs, with the coefficients of -0.106, -0.105, -0.163 and -0.0213, respectively.

Generally, the small-GDP sub-sample does not show a significant and consistent relationship between the degree of financial liberalization and contrarian payoffs. In contrast, the findings suggest a more pronounced effect of the degree of financial liberalization on contrarian payoffs for large-GDP sub-sample. This finding can be interpreted in a way that the large and comparatively developed equity markets adapt the financial liberalization process, more sophistically than the small markets. This can be partly interpreted as to why we see a decline in contrarian payoffs, specifically for relatively large markets. These results comply with Bekaert et al. (2005), who state that financial liberalization leads to greater growth response for large economies with high-quality institutions. The crisis period results also provide important insight, the higher and more significant coefficients of global financial crisis for large-GDP subsample suggest that the global crisis distorted the price efficiency of higher economies more than the Asian financial crisis. Conversely, the small economies' efficiency seems to be affected mostly by the Asian financial crisis, as shown by the higher and more significant coefficients of Asian Crisis dummies.

Table 5. 8: Contrarian payoffs and the degree of financial liberation: Sub-sampling according to the GDP

Panel-A: Small-GDP sub-sample				
FEL	-0.3516***			
	(-18.46)			
EW		0.0349***		
		(3.90)		
LMF			-0.0467***	
			(-10.17)	
CI				-0.0172***
				(-8.00)
Market State	-0.0091	0.0180	0.0021	-0.00049
	(-0.68)	(1.46)	(0.16)	(-0.04)
Volatility	0.0014	0.0039	-0.0265***	0.0083
	(0.23)	(0.69)	(-3.87)	(1.51)
Asian Crisis	0.0891***	0.0866***	0.1029***	0.0937***
	(14.92)	(15.23)	(16.90)	(16.60)
Global Crisis	0.0429***	0.0415***	0.0461***	0.0446***
	(8.68)	(9.30)	(9.22)	(9.53)
Country fixed effects	Yes	Yes	Yes	Yes
Ad. R^2	0.0414	0.0250	0.0289	0.0273
Panel-B: Large-GDP sub-sample				
FEL	- 0.1067***			
	(-6.00)			
EW		-0.1051***		
		(-11.96)		
LMF			-0.1630***	
			(-15.84)	
CI				-0.0213***
				(-16.98)
Market State	0.0854***	0.1003***	0.0907***	0.1024***
	(6.85)	(8.81)	(7.31)	(9.03)
Volatility	0.0098	0.0381***	-0.0032	0.0237***
	(1.75)	(8.12)	(-0.58)	(5.04)
Asian Crisis	0.0534***	0.0522***	0.0439***	0.0441***
	(10.39)	(10.80)	(8.52)	(9.21)
Global Crisis	0.0561***	0.0451***	0.0695***	0.0505***
	(10.51)	(9.07)	(12.90)	(10.15)
Country fixed effects	Yes	Yes	Yes	Yes
Ad. R^2	0.0190	0.0266	0.0305	0.0332

Notes: This table provides the regression results of Eq. 5.1: $logLMW_{it} = \alpha + \beta_1 Finlib_{it} + \beta_2 MKT_{it} + \beta_3 VOL_{it} + \beta_4 AsianCrisis_t + \beta_5 GlobalCrisis_t + country_{it} + \varepsilon_{it}$ for GDP based subsamples of countries. Panel A presents the results of the small-GDP subsample, which includes Thailand, Malaysia, Pakistan and Philippines. Panel B reports the results of large-GDP subsample, which includes China, India, Korea and Indonesia. The dependent variable is the log transformation of contrarian returns (LMW). The definition of rest of the variables is the same as in Table-5.1. Each column of Table-5.8 represents the results of a separate regression run with one of the four measures (FEL, EW, LMF and CI) of the degree of financial liberalization. The values of the t-statistic are provided in parentheses. *** denote the significance level 1 percent.

5.5 Conclusions

This research addresses the question of whether the degree of financial liberalization influences the time variation in contrarian payoffs in emerging equity markets. To answer this question, the study considers both, the identical and time-varying natures of financial liberalization. Unlike previous researches that test the effect of financial market liberalization on market returns or volatility, the current research examines the behavior of contrarian strategy payoffs under varying degrees of financial liberalization. In the empirical analysis, the study specifically focuses on the emerging markets of the Asia-Pacific region. The sample countries include China, Malaysia, Indonesia, Thailand, Korea, Pakistan, India and Philippines, as these emerging markets exhibit a gradual change in the degree of financial liberalization instead of fully opening their markets to foreign investors at once like the emerging markets of some other countries, such as: Chile, Hungary, Argentina, Poland, Turkey and South Africa.

While the study confirms the existence of a contrarian effect in all the emerging markets, it also finds that these returns aggravate during crisis periods, particularly during the Asian financial crisis. In line with previous researches, the study confirms the presence of a significantly negative relationship between market state and a positive association of stock market volatility with contrarian payoffs. The degree of financial liberalization, which is the focus of this research, has a negative association with the time-varying contrarian payoffs. The study obtains similar conclusions by applying three different techniques: portfolio formation and subsequent returns, panel regressions, and binary modeling of financial liberalization with event study methodology. The binary modeling analysis further incorporates the different measures of the degree of financial liberalization into the model to account for the impact of partial and complete liberalization.

The Wald test statistic for the differences between coefficients of pre-post and pre-after confirms the significant change in contrarian payoffs after the initial relaxation of cross-border restrictions. The overall research findings coincide with an argument that the expansion of foreign investor base through financial liberalization, increases the quality of information available to the public and thus reduces the possibility of abnormal returns for stock selection strategies. These results provide leverage to the findings of those latest studies that test the role of financial market liberalization on different measures of stock market quality (i.e. volatility, market returns or cost of capital), and support the investor-based broadening hypothesis (Bekaert et al., 2005; Moshirian, 2007; Umutlu, Akdeniz, et al., 2010). Further analysis reveals more significant results for large-sized emerging markets as compared to small-sized markets, suggesting that the large equity markets more efficiently incorporate the information of financial liberalization into their equity prices.

CHAPTER 6: CONCLUSIONS AND IMPLICATIONS

6.1 Conclusions

Contrarian investing involves hunting for stocks that are seemingly not trading up to their value potential. While contrarian investors generally assume that specific crowd behavior among investors can cause mispricing in stock markets that can create exploitable return opportunities. The ground of this particular investment strategy is the stock market overreaction. According to this hypothesis, the stock prices overreact and then move towards their intrinsic values by showing the mean reversion of stock prices. The studies in recent literature find that contrarian and momentum profits differ dramatically across markets. For instance, Chui et al. (2000), Griffin et al. (2003), Locke and Gupta (2009), Asness et al. (2015), and Yu et al. (2019) report strong contrarian effects in emerging Asian markets, while the opposite trend prevails in developed markets. The interpretation and significance level for stock market anomalies varies over time based on local market characteristics (Asness et al., 2015). Various studies have offered different risk-based (e.g., Jegadeesh & Titman, 1993; Avramov & Chordia, 2006) and behavioral (e.g., Nofsinger & Sias, 1999; Hong et al., 2000) explanations over the past few decades for the existence of momentum and contrarian patterns. However, it is still inconclusive how the past performance of stocks leads to their subsequent performance, enabling investment strategies to produce abnormal returns by leveraging stock market inefficiencies.

The dynamic market assumption of the Adaptive Market Hypothesis (AMH) focuses on the notion that market performance levels differ over time depending on market dynamics, competition level, market participants, and their adaptability. The applicability of AMH to the dynamic nature of emerging markets in South Asia requires further attention, especially in the context of contrarian effect. Mean-reversal of stock

prices, non-random returns, and information asymmetry among various group of investors are common issues in these emerging markets (Chui et al., 2010; M. Liu et al., 2011; Akhter & Yong, 2019). Moreover, small investors and noise trading dominate these emerging markets, whereas small investors' investment decisions are usually triggered by sentiments, noise, or past share price movements rather than market fundamentals. In addition, over the past three decades, Asian emerging markets have undergone several regulatory changes. In some Asian countries, there were more restrictions on foreign investors' participation in local equity markets. From the late 1980s, foreign equity participation in these markets improved significantly (see, e.g., Bekaert & Harvey, 1997; Bekaert & Harvey, 2000). However, the degree of financial liberalization has varied across countries over time.

Based on the above-discussed systemic and psychological disparities in Asian emerging markets, along with established literature, these markets behave opposite to developed markets and give important insights about returns of stock market anomalies. Momentum investing approach deems to be successful in developed stock markets (e.g., Rouwenhorst, 1998; Grundy & Martin, 2001; Lewellen, 2002; Hart et al., 2003; Grinblatt & Moskowitz, 2004; Fama & French, 2008, 2012; Asness et al., 2013; Wang & Xu, 2015). However, all the above highlighted issues of selected emerging markets make these markets highly volatile, which may create frequent opportunities of abnormal returns based on contrarian investment strategies in sample emerging markets. Therefore, the current thesis evaluates the contrarian effect in time-varying market circumstances of the Asian economies. For the purpose of analysis, the main objective has been broken down into three sub-objectives (essays). The first essay evaluates the effectiveness of the contrarian approach in varying conditions of South-Asian emerging markets such as bull, bear, high volatility, low volatility, stock market bubbles, and crashes in order to find some implications from the dynamic market assumption of the

AMH. The second essay attempts to investigate the predictive ability of various firm-specific, industry-specific, macroeconomic as well as global factor over contrarian strategy's profitability. Finally, the third essay examines the behavior of contrarian strategy payoffs under varying degrees of financial market liberalization in some major emerging economies of the Asian region.

Objective One: The first essay on Objective 1 discusses the relationship between time-varying stock market conditions and contrarian returns in South Asian stock markets based on the dynamic market assumption of the AMH. To achieve this objective, the study examines the time-varying risk-premium relationship within the framework of contrarian effect by utilizing portfolio formation and rebalancing method, capital asset Pricing model (CAPM), and Fama and French three-factor model. The relationship between contrarian profitability and market factors that may define the context of investment is also examined.

Preliminary findings from this study confirm a statistically significant contrarian effect in sample emerging markets. Importantly, contrarian strategies yield significantly higher returns in times of crisis, more than twice that of the non-crisis periods in all markets. Upon examining the payoffs to winners and loser portfolios, the study finds that higher contrarian returns are primarily associated with the outperformance of loser portfolios, specifically during negative market states and crisis periods. Moreover, the market risk factors do not fully explain contrarian returns in South Asian markets. One potential reason for contrarian profitability during the negative market and crash times may be that buyers are looking for safe havens during those periods and flocking to better-quality (winner) stocks that have higher ratings. Furthermore, the common pessimism against loser stocks will push their prices too low, exaggerating the risks and reducing the likelihood of returns to these stocks. Subsequently, as the market rebounds, loser stocks outperform due to the correction of

overpriced and underpriced stocks. Thus, buying these troubled stocks at cheaper prices and selling after market recovery contributes to substantial future returns. These findings comply with the recent research of Daniel and Moskowitz (2016). They claim that momentum strategy crashes when the market rebounds, especially in panic and higher market volatility states. Further analysis based on CAPM and augmented Fama and French three-factor models indicate that the risk-adjusted profits vary over time, while the factor loading on various risk factors is non-constant. These findings comply with the AMH.

After verifying the existence of a reversal effect with preliminary indication of the time-varying behavior of contrarian payoffs, the research further examines the pattern of contrarian payoffs under varying market states (POSITIVE/NEGATIVE) along with volatility (HIGH/LOW) clustering across each market state. This section's findings reveal that the higher mean and risk-adjusted payoffs to contrarian strategy can be observed in negative market states with higher volatilities. Furthermore, we see a more pronounced effect of market state (POSITIVE/NEGATIVE) than market volatility (HIGH/LOW). The less pronounced volatility impact across each market state indicates the more dominant role of market state on contrarian strategy payoffs in emerging markets. These findings contradict the U.S equity market results, where the volatility factor acts as the primary predictor of momentum anomaly payoffs (Wang & Xu, 2015). The study conducts a similar analysis for six other leading emerging Asian markets, namely China, Indonesia, Korea, Malaysia, Philippines, and Thailand. The study again witnesses the wax and wane in contrarian payoffs across market states in each country. Finally, the regression analysis through binary modeling of market macro-environment related factors provides leverage to our earlier findings.

Objective 2: The second essay dealing with Objective 2 investigates the predictive ability of various firm-specific, industry-specific as well as macroeconomic and global

factors over contrarian strategy's profitability. To achieve this objective, the study initially examines the performance of style investment strategies on the basis of firm-specific characteristics. Based on trading volume and market value parameters, the study constructs contrarian style portfolios. Trading volume is a good indicator of information asymmetry (Lee & Swaminathan, 2000), and market value-based style portfolios appeal to both institutional and individual investors because they help them organize and simplify portfolio allocation choices (Barberis & Shleifer, 2003; H.-L. Chen & De Bondt, 2004). Based on trading volume and market value factor, stocks are classified into five distinctive groups. The top 20% stocks form the highest liquidity and highest market value portfolios, while bottom 20% stocks form the lowest liquidity and lowest market value groups. Within each group of highest and lowest liquidity and market value, the stocks are further sorted into winners and losers portfolios on the basis of lagged 12-month returns. Finally, the style contrarian effect is analyzed by holding the contrarian style portfolios over the holding period (t+1) month.

After examining the impact of firm-specific factors on contrarian profitability, the study then moves to investigate the impact of industry characteristics. The study first categorizes stocks into 22 industry groups based on Thomson Reuters Business Classification (TRBC). Following that, industries are classified into quintile portfolios based on their prior performance. To examine the industry contrarian effect, the study forms portfolios based on previous 12-month and 6-month formation periods. As an alternate approach, the study also evaluates the performance of industry-neutral contrarian portfolios. The study identifies the top three prevalent industries in each stock market that have the highest number of stocks. Within each industry pool, portfolios are created to see if the contrarian effect still holds when industry influence is taken into account. Finally, the study divides the total study period into crises, non-crises, and Covid-19 sub-periods to evaluate the impact of different market states on

industry contrarian effect. In the final section of this analysis, the study investigates the predictability of various macroeconomic and global factors towards contrarian profitability with the help of predictive regression proposed by Wang and Xu (2015).

The empirical results regarding the predictability of firm-specific factors demonstrate that both trading volume and market value factors show significant predictability towards contrarian profitability. The stocks that fall in lowest trading-volume and lowest market value groups generate highest contrarian returns for investors. For example, contrarian strategy formed on the basis of winners and losers stocks of lowest trading volume group generates 3.68%, 1.13%, and 4.25% monthly returns for Pakistan, Bangladesh, and India, respectively. On the other hand, portfolios of highest volume stocks generate momentum returns for Bangladesh (-0.18%), and India (-0.03%) while contrarian returns for Pakistan (0.17%). In addition, prior winner portfolios associated with lowest trading volume and lowest market value groups experience greater short-term reversals in the subsequent holding periods. In short, the study finds a strong and statistically significant association between selected firm-specific factors and contrarian profitability.

Regarding the impact of industry-specific factors, the study finds that investors can yield higher returns by carefully designing the industry contrarian portfolios. The analysis confirms that industries with lower returns in the past outperform other industries in subsequent periods. Interestingly, industry-neutral contrarian portfolios produce the largest contrarian returns, meaning that investors can maximize their earnings by concentrating on a single industry at a time and building winner and loser portfolios within that industry. On average, industry-neutral contrarian portfolios generate monthly mean profit of 3.22%, -0.03%, and 4.30%, respectively for Pakistan, Bangladesh, and India based on the 12-month formation period. Whereas 4.33% (for Pakistan), 1.95% (for Bangladesh), and 4.56% (for India) mean contrarian returns are

yielded based on strategies with 6-month formation period. Further analysis investigating the impact of varying market conditions on industry contrarian effect reveals that industry contrarian effect was stronger during the periods of Asian financial crisis and global financial crisis. However, industry momentum effect was observed during non-crises periods, particularly after the period of global financial crisis due to the greater momentum for winner industries.

Finally, the results based on predictive regressions; examining the impact of macroeconomic and global factors, show that the Industrial Production Index (IPI), Balance of Trade (BOT), and three-month interest rate (3M-INT) are the most important macroeconomic factors that show significant predictability over contrarian strategy payoffs in South Asian emerging markets. Even after controlling for the influence of global risk proxies, the predictive power of these regional macroeconomic determinants persists. The analysis based on additional global predictors reveals that variation in global market returns (MSCI index) predicts the changes of returns in contrarian payoffs, suggesting a strong association between global stock price movements and contrarian strategy returns in selected emerging stock markets. The impact of global market volatility, measured through VIX (CBOE Volatility Index), is only significant when the impact of MSCI is controlled in the model.

Objective 3: The third essay covering objective 3 examines the behavior of contrarian strategy payoffs under varying degrees of financial liberalization in some leading Asia-Pacific emerging markets over the period 1997 to 2017. The sample countries include China, India, Indonesia, Korea, Malaysia, Pakistan, Philippines, and Thailand, as these emerging markets exhibit a gradual change in the degree of financial liberalization instead of fully opening their markets to foreign investors at once like the emerging markets of some other countries, such as: Chile, Hungary, Argentina, Poland, Turkey, and South Africa. The study uses portfolio formation, panel regressions, and

binary modeling approaches to examine the effect of partial and complete financial liberalization on contrarian returns.

The study starts empirical investigation by splitting the sample of emerging markets into the most- and least-liberalized sub-samples based on four different measures of the degree of financial market liberalization. The research then investigates the relationship between contrarian returns and financial liberalization with binary modelling approach by keeping in mind that there are two schools of thought on the possible impact of financial liberalization on stock markets. On the one side, the process of financial liberalization is viewed as a one-time event (Foerster & Karolyi, 1999; Kim & Singal, 2000; Chari & Henry, 2004; Umutlu, Salih, et al., 2010). Another school of thought, on the other side, believes that financial market liberalization is a time-varying process, where the speed and implementation of the liberalization varies based on the local market conditions (Bekaert & Harvey, 2002; Edison & Warnock, 2003; Bae et al., 2004). As the selected sample of emerging markets exhibits a gradual change in financial liberalization process, it enables us to measure the impact of partial and more complete natures of financial market liberalization on contrarian returns.

The preliminary findings reveal that all the markets in our sample are driven by contrarian returns. These returns hold even after controlling for the CAPM-based risk adjustments. Both country selection and stock selection (country-neutral) strategies generate consistent and significant contrarian returns. The degree of financial liberalization, which is the focus of this study, is negatively associated with the series of contrarian returns. Further investigation reveals that small and less liberalized stock markets provide opportunities for investors and fund managers to generate higher contrarian returns that cannot be produced through other investment strategies. In contrast, the large and highly liberalized emerging markets offer fewer opportunities for abnormal contrarian returns. These results comply with the investor-base broadening

hypothesis, which suggests that the broadening of foreign investor-base with financial liberalization results in more openness and efficiency of asset prices, thus reduces the scope of returns for various investment strategies (Merton, 1987; Wang, 2007).

The binary modeling of financial liberalization and further inclusion of various proxies of the degree of financial liberalization into binary models also find similar results. The GDP-based subsamples confirm that the negative relationship between the degree of financial liberalization and contrarian payoffs is more pronounced for the large-GDP subsample as compared to the small-GDP sub-sample. This finding partly explains why we see a decline in contrarian payoffs, specifically for large and more liberalized markets. These results comply with Bekaert et al. (2005), who claim that financial liberalization leads to a more significant growth response for large economies with high-quality institutions. Finally, the global financial crisis has more of a deteriorating effect on market efficiency of large economies, while it has a lesser impact on small economies. In comparison, the Asian financial crisis has more of a detrimental effect on small economies compared to their larger counterparts.

6.2 Recommendations and Policy Implications

The overall findings of this thesis may serve as useful inputs for investors and fund managers to devise contrarian investment strategies in emerging market economies. Together, the study provides additional insights for policymakers in building governance frameworks for market intermediaries and managing financial liberalization and integration policies within their respective countries.

Amongst some of the repercussions of first objective is that researchers and analysts can use evidence provided in this study to support their argument that emerging economies suffer from structural issues and investor behavioural characteristics are distinctive. These issues and characteristics are conducive for allowing speculative and noise trading to thrive which will ultimately be detrimental to investors. Furthermore,

the herd-like behavior and lack of sophistication among retail investors during periods of recessions and high levels of uncertainty could potentially lead towards a high degree of destruction and devaluation of the value of investor portfolios. If left unchecked in the long run, the resultant market inefficiencies could lead towards an insipid market where potential investors are less than willing to participate in the stock market.

One of the practical implications of this study is that there are investment opportunities for investors and fund managers investing in emerging economies. Investors need to focus on emerging market economies which exhibit stock characteristics suitable to generate contrarian returns and should time their investments for periods of negative market conditions with high market volatility. This is also a viable alternative for international investors who want to participate in sophisticated developed markets but can't build contrarian-style portfolios in their own markets. Stock markets in developed economies tend to exhibit momentum returns for investors and provide fewer contrarian portfolio returns especially during recessions.

Policy makers in developing economies could use results of this study as further evidence that there are structural issues that need to be addressed in these countries in order to reduce possibilities of investors taking advantage of market imperfections, which leads towards possible speculative activities performed by informed stock market participants. In essence, markets that are more efficient would attract fewer speculative activities and would encourage greater participation of investors in the long run.

The study findings regarding the predictability of firm-specific factors provide an important implication for investors and portfolio managers based on the argument of Lee and Swaminathan (2000) that trading volume contains information content. Winner stocks with higher trading volume face greater information asymmetry; therefore, overinvestment in these stocks may lead to significant short-term reversals in subsequent periods. Next, this study finds that investors can earn superior returns by

carefully forming industry portfolios. Additionally, industry contrarian effect can generate higher returns during crises periods, while momentum would be observed following a down market trend. The findings of this section imply that the relevance and significance of industry characteristics cannot be ignored in interpreting the anomaly returns, and industry component should be considered while pricing various assets. The overall study findings offer an important implication to investors and fund managers that contrarian strategy with value stocks, conditional on firm, industry and macroeconomic factors, can yield superior returns in selected emerging stock markets. These findings are particularly important in emerging market context because these markets mostly exhibit lower returns for conventional momentum strategies.

Finally, the results regarding the contrarian effects in changing degrees of financial liberalization indicate that there are opportunities for investors and fund managers to take advantage of emerging markets by employing contrarian strategies. This strategy can be used in crisis periods and in the markets with a lower degree of financial liberalization to get superior returns that cannot be earned by alternative investment strategies. Furthermore, the large and relatively developed emerging markets are more efficient in adjusting the financial liberalization process, thus offer fewer opportunities to realize profits through contrarian strategies.

From a policymaker's perspective, a gradual increase in financial liberalization has implications in terms of developing a more prudent financial regulations in emerging markets. As emerging markets have been gradually liberalizing their economies, there has been a reduction in market inefficiencies due to higher levels of financial integration and liberalization. This would suggest there is a trade-off between contrarian profit opportunities and the degree of financial liberalization. Thus, even though contrarian trading strategies provide certain advantages to institutional and individual investors, these trading strategies would mount added downward pressure on the stock market and

the economy at large when there is a large sell-off amongst investors. An increase in financial liberalization, which presupposes an improvement in prudential financial regulations, will reduce information asymmetries and improve systemic risk in the market. Furthermore, this improvement comes at a cost to contrarian investors seeking risk-reward opportunities in less developed economies.

Our findings are in line with the assertion that the expansion of investor-base with international investors through financial liberalization improves public information quality, which decreases the chances of abnormal returns by increasing market efficiency. These results have implications for the financial liberalization policies of governments that influence the capacity of firms to generate funds for profitable investments and to contribute towards the overall economic growth of the country. In the context of societal impact, this would benefit the economy and the larger population, as financial and economic resources would be efficiently priced. The government and the rest of society would also benefit from an efficient market, as there would be an increase in capital investment and new enterprises.

More broadly, the findings of this research can help investors better understand how different risk indicators impact asset prices in sample stock markets, empowering them to make more informed and reliable investment decisions. The returns of investment strategies can be compared by international investors with an interest in emerging countries before building portfolios that maximize risk diversification and return potential. Future study could focus on the investigations of other fundamental factors, comparing the investment anomaly returns across markets, and the liquidity analysis of high-frequency stock transaction data. Moreover, the impact of different investor behavior and investor sentiments cannot be ignored, rather further investigation can be made on this important issue.

In the perspective of different types of investors, the results of this research imply that the profitability of contrarian strategy might be improved by investors through conditioning their trades on the level of risk aversion in selected stock markets. As evident in the existing literature, there is a positive relationship between the changes in risk appetite of investors and their propensity to involve in risky transactions such as contrarian trading (Demirer & Zhang, 2019). Moreover, as the propensity of investors to herd would be directly related to the changes in their risk-taking, it is possible that the market's condition regarding the level of risk aversion would predict the profitability of contrarian trading. Clearly, the profitability of contrarian trading is greatly influenced by the herd behavior of investors, especially because of its impact on how prior loser stocks behave in succeeding periods. The risk-averse investors hesitate to invest in prior loser stocks and show herding behavior during the positive market states, which may lead to short-term momentum, but ultimate contrarian returns in the long run. However, the investors with higher risk-taking ability can take long position in risky prior loser stocks and significantly gain during the down states of the market. In a nutshell, the presence of time-dependent risk aversion or risk-taking behavior of investors provides an intriguing window, which allows us to understand the behavioral aspects of the time-varying contrarian anomaly. Furthermore, as the overall results of current research suggest that profitability of contrarian anomaly is time-dependent, where the strategy gains higher returns during the negative market state and crisis periods. It would be an interesting question to explore in future research whether the time-varying risk aversion of investors absorbs the predictive power of market state or volatility in the presence of various predictors used in the current research. In this manner, we may suggest a hybrid contrarian investment strategy to investors that could lead to positive payoffs based on the level of risk aversion of investors in the selected stock markets.

6.3 Limitations and Future Research Recommendations

The overall research finds some limitations in the data and theoretical context. As the research has examined the contrarian effect in the context of Asian emerging markets based on various firm, industry and macroeconomic characteristics. The study did not use a wide range of country specific control variables as some variables have a definite impact on contrarian anomaly returns, so the inclusion of more control variables in different contextual settings can provide a broader picture. We find another limitation in this research of moderating factors which may increase or decrease the contrarian effect in emerging markets. For example, culture is a prominent factor that can create an accelerating push for contrarian effect in the shape of higher or lower individualism. The recent literature documents that the higher degree of individualism leads to greater overconfidence of investors, which may result in short-term momentum and long-term contrarian effect in stock markets. Chui et al. (2010) associate momentum effect with the degree of investors' individuality in a country. Their findings imply that economies with high individualistic Hofstede (2001) scores also have larger average momentum returns. For frontier equity markets, the average individuality score is low. A low score indicates that social groupings, including families, are more significant that individuals in the country. Therefore, countries with lower score of individualism may generate higher contrarian effect. So future studies may use Hofstede (2001) dimensions as moderating variables to improve the nexus's theoretical foundation.

The empirical investigations in the literature also suggest that investors consider investor sentiment when making an investment decision. Therefore, the impact of investors' behavior and attitude on the contrarian effect cannot be overlooked; rather, further research may be conducted on this crucial issue. Further studies can consider consumer confidence index (CCI) and investor sentiment index proposed by Baker and Wurgler (2006). The contrarian approach also produced an anomalous return based on

seasonal effects. The research can compare the performance of various investment techniques such as 52-week high investing proposed by George and Hwang (2004) and the traditional momentum by Jegadeesh and Titman (1993) to generalize the overall findings of current research. These methods altogether can be helpful to fund managers and financial analysts when making investment decisions.

Finally, future research can further shed light on the debate by looking into the effect of the degree of financial liberalization on other series of returns, such as momentum or dynamic momentum strategy that are evidenced in relatively more developed markets. The studies can examine whether the return series of these stock selection strategies exhibit the same pattern as reversals. The dynamic momentum strategy has recently been tested by Daniel and Moskowitz (2016) during the phases of momentum crashes and suggested that this strategy outperforms other approaches in panic market states. Additionally, the research on the subject matter could be conducted to investigate reversals' behavior in different frontier and remaining Asian markets.

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