CHAPTER I
INTRODUCTION: ISSUES AND OBJECTIVES

1.1. BACKGROUND AND RATIONALE OF THE STUDY

Competition in capital markets requires continuous and cost effective trading strategies. In the world of diversification, portfolio managers and analysts are interested in holding their portfolios across mature as well as emerging markets owing to the risk differential in these markets. The emerging markets play an increasingly important role in global economic development and financial systems. In the last decade, BRICKS countries have taken advantage of their abundant natural and human resources on the whole achieving very high growth rates, and thus attracting investors to these prominent economies other than developed countries.

The capital markets in the emerging economies until the mid 1980s generally suffered from bank dominated economies. The confidence of investors has boosted in the developing countries with financial liberalization and adoption of strict regulations. As a result the flow of private capital has increased in form of Foreign Direct Investments (FDI) and portfolio investments. In 2001, Goldman Sachs in its report (on Dreaming with BRICs: The path to 2050) gave the acronym BRICs for the countries of Brazil, Russia, India and China. The growth projections for these countries suggest that they together will become a large force in the world economy. Goldman Sachs forecast that BRICs economies taken together in terms of GDP can become larger than G7 economies (US, Japan, UK, France, Germany, Italy and Canada) by 2039.

Recently, the investment banking industry has expanded the emerging markets basket from BRICs to BRICKS, which now includes the countries of South Korea (K) and South Africa (S). BRICKS represent one of the most active segments of emerging markets. They are on the radar of global portfolio managers owing to the belief that emerging markets exhibits low degree of co-relation with mature markets. These markets have a history of providing high returns while ensuring risk diversification in a global portfolio. Investment managers are continuously on the lookout for developing trading strategies that can provide extra normal returns and analyze several stock characteristics and return patterns for this purpose.
Asset pricing literature has witnessed a paradigm shift over the last four decades. The basic challenge that economists face is the quantification of relationship between return and risk. Harry Markowitz (1952, 1959) was the first to lay the foundation of Capital Asset Pricing Model. Sharpe (1964) andLintner (1965) extended the Markowitz theory and developed their one factor model, Capital Asset Pricing Model (CAPM). The model provides the linear relationship between returns on a financial asset and its sensitivity to returns on a broad based market portfolio. There have been several extensions to CAPM such as the Black’s Zero beta CAPM.

Researchers have observed that portfolios formed on basis of some company characteristics are not explained by CAPM and are known as CAPM anomalies. Size, price-earnings (P/E) ratio, profits, accruals, net stock issues, book equity to market equity (BE/ME) ratio, firm leverage and prior return patterns are the prominent asset pricing anomalies. Several empirical tests on CAPM suggest that a multi factor domain is needed to explain asset returns. Merton (1973) and Ross (1976) have developed multi-factor framework to explain returns. To explain the anomalies, Fama French (1993) developed an empirical model with three factors: market, size and value. The Fama French model is not able to explain the momentum anomaly as documented by Jegadeesh and Titman (1993). Following this, Carhart (1997) developed an augmented Fama French model with four factors, three Fama French factors and an additional stock momentum factor to explain the momentum phenomenon. The growing empirical evidence in favor of multi-factor models, based on company characteristics, tends support to the empirical model of Fama-French; however, the model still needs strong economic foundation before it can replace CAPM.

Prior return patterns in stock returns have been one of the most puzzling asset pricing anomalies in financial economics. Broadly, long-term reversals (contrarian) and short-term continuation (momentum) have received particular attention. The contrarian strategies perform well for very short term (up to 3 months), see Lo and MacKinlay (1990) and long term (3 years - 5 years), see De Bondt and Thaler, (1985, 1987) while momentum strategies perform well for short term (between 3 months - 12 months), see Jegadeesh and Titman, (1993).

DeBondt and Thaler (1985, 1987) were first to document reversals in long-term
returns i.e. stocks with low past returns tend to have higher future returns. On the other hand, Jegadeesh and Titman (1993) find that short-term returns tend to continue, hence suggesting momentum profits. Other researchers show that the average stock returns are related to size, Banz (1981), value (P/B or P/E), Chan, Lakonishok and Hamao (1991), earnings/price (E/P), Basu (1977, 1983), leverage, Bhandari and Weiss (1996), book-to-market-equity (Rosenberg, Reid and Lanstien (1985) and past sales growth, Lakonishok, Shliefer and Vishny (1994), dividend yield (Litzenberg and Ramaswamy, 1979). The driving force behind prior return patterns remains a puzzle. Some attribute it to missing risk factor(s), see Fama and French (1996) while other researchers believe that they owe a behavioral explanation (see, Barberis et al., 1998; Daniel et al., 1998 and Hong and Stein, 1999). Recent studies give evidence of these strategies to be profitable for both mature as well as emerging markets; however the argument on the source of the profitability of contrarian and momentum strategies still remains an issue.

Over the last decade, foreign institutional investors have focused on emerging markets. Many studies have been conducted to understand the trading rules and activity in these markets. The studies have been carried out by Claessens, Dasgupta and Glen (1998), Fama and French (1998), Patel (1998), Rouwenhorst (1999), Barry, Goldreyer, Lockwood and Rodriguez (2002) and Vander Hart, Slagter and VanDijk (2003), in general they conclude that stock selection strategies that work well in developed markets also provide extra normal returns for emerging markets. Other studies by Frankel and Schmukler (1996, 1998), Froot, Conell and Seaholes (2001), Richards (2002) and Kaminsky, Lyons and Schmukler (2002) show that foreign investors in emerging markets tend to employ momentum strategies. Hameed and Kusnadi (2002) document that momentum trading strategies applied to six Asian markets do not yield significant returns. Swanson and Lin (2005) investigated 18 developed and 18 emerging markets (including all BRICKS countries out of 18 emerging markets basket) and conclude that markets reflect winners-momentum trading and losers-contrarian trading.

Small body of literate exists for the Indian market. Sehgal and Balakrishnan (2002) find that there is reversal in long-term returns, once short-term momentum effect has been controlled. They also find short-term continuation in stock returns. Sehgal and Balakrishnan (2004) show that momentum returns that are missed by CAPM are
partially explained by Fama-French three factor model. Ananthanarayanan (2004) does not report any evidence of contrarian and momentum strategies being employed by foreign investors in Indian market. Sehgal and Balakrishnan (2008) report strong momentum profits in India for individual stocks as well as wide range of characteristic-sorted portfolios. The study suggests there are rational sources of momentum profits, which are in contrast to U.S. market.

Since the end of nineties, a body of literature has emerged that concentrates on prior return patterns in sector returns and which advocates that these sector patterns tend to drive prior return patterns in stock returns. The belief here is that the stocks within a sector have a lot in common in terms of business perspectives and hence winner stocks may be indebted to their success of being a part of winner sectors while loser stocks may belong to poor performing sectors. Moskowitz and Grinblatt (1999) attribute the observed momentum in intermediate-term stock returns to industry momentum. Liu and Zhang (2008) document that growth rate of industrial production is a risk factor in asset pricing tests and can explain more than half of momentum profits. The importance of stock selection on basis of sectors or industry classification may be as important as considering the past excess returns of stocks when investing in a foreign market. The evidence for prior return patterns in sectors is limited to developed markets and is missing for developing economies.

The global portfolio managers and investment analysts are interested in holding their portfolios across mature as well as emerging markets. There is vast evidence on testing of prior return patterns in stock returns and portfolios formed on basis of individual company characteristics. However, past research has so far concentrated on developed markets and only a few studies exist on prior return patterns in stock returns for emerging markets. BRICKS countries are an important emerging market basket, the research on these countries is limited (see, Swanson and Lin, 2005). Investment practitioners have observed that there are certain style characteristics that provide extra normal returns, although inadequate literature exists on stylized portfolios where the portfolios are formed on basis of company characteristics and past returns. Further, previous work has concentrated on testing of prior return patterns in stock returns, though there is limited evidence on testing of prior return patterns in sector returns for emerging markets and whether these sector patterns drive similar patterns in stock returns. The study on prior return patterns in sector returns
has been done for developed markets and researchers have observed that some factors
related to industries can account for prior return patterns in stocks. Moreover, most of
the asset pricing anomalies have been tested using CAPM and the Fama French three-
factor model. Some empirical work has also been done using the Carhart four-factor
model with stock momentum as an additional factor risk along with the three factors
(market, size and value) of Fama French model. The economic rationale for the stock
momentum effect is very weak; this makes a strong case for application of some other
risk factor related to sectors as the belief here is that the companies belonging to a
particular sector have much more in common in terms of fundamentals and
operations. This provides impetus for testing of prior returns in stock and sector
returns for emerging markets including the Indian environment using an entirely
different perspective.

This chapter is organized into eight sections including the present one. Section 2
describes the objectives of study while testable hypothesis have been discussed in
section 3. In Section 4, brief description of data and their sources has been provided.
Section 5 and 6 covers the methodology employed and summary of empirical results
respectively. Section 7 contains relevance of the study and finally the eighth section
gives the organization of the study.

1.2. OBJECTIVES OF THE STUDY

The study has the following objectives:

- To investigate whether contrarian and momentum investment strategies
  provide extra normal returns for BRICKS capital markets on basis of past
  returns and characteristic sorted portfolios.

- To examine contrarian and momentum profits, i.e., whether the strategies can
  be explained better by behavioral models or by standard risk models such as
  Capital Asset Pricing model (CAPM) and the Fama French three-factor model.

- To evaluate if there are any prior return effects in sector data and whether the
  sector factor formed on these prior return effects, can possibly explain a part
  of extra normal returns for the sample portfolios that are missed by CAPM and
  the Fama French three-factor model.
• To assess whether there any prior return patterns at sector, industry group and industry level and whether these patterns differ for short-term (up to 12 months) and long-term (24-60) portfolio formation windows.

• To study whether winner and loser sector exhibit different growth potential as suggested by Liu and Zhang (2008).

1.3. TESTABLE HYPOTHESIS

In the light of above objectives, this study intends to test the following research hypothesis for BRICKS countries:

• Prior return based trading strategies are highly profitable for short-term strategies.

• Characteristic sorted prior returns portfolios provide higher returns vis-à-vis prior return portfolios.

• Returns on prior return based and stylized portfolios are not explained by Capital Asset Pricing Model.

• The Fama French model is also not able to fully capture short-term prior return patterns in stock returns.

• There are prior return patterns in sector returns for short-term windows as is observed in case of stock returns. The four-factor model comprising of Fama French factors and sector prior return factor is a better descriptor of asset pricing than one-factor CAPM and three factor Fama French model.

• There are long-run prior return patterns in stock returns.

• Stylized portfolios based on company characteristics and long-term prior return patterns tend to provide better returns than portfolios based only on prior returns.

• CAPM fails to fully account for the long-run prior return patterns.

• Prior return patterns are partially captured by Fama French model for long-term formation windows.

• There are long-run prior return patterns in sector returns.
• The augmented Fama French model containing sector prior return factor does a better job in explaining asset returns than one factor CAPM and Fama French three-factor model.

• There are prior return patterns in sector returns at all the three levels, i.e. sector, industry group and industry level.

• The patterns differ for short-term and long-term formation windows.

• Winner and loser sector exhibit different growth potentials and the winner sectors exhibit higher risk owing to stronger growth potential for the sample countries.

• Prior return patterns in stock returns are absorbed by similar patterns in sector returns.

1.4. DATA

The data for the six emerging economies, namely Brazil, Russia, India, China, South Korea and South Africa (BRICKS) has been obtained from Thomson & Reuters Datastream software. Data comprises of monthly share prices adjusted for stock splits, stock dividends and rights issues and the sample period is from January 1993 to February 2008 except for Russia where the sample period is January 2000 to February 2008 due to paucity of data. The number of securities for each of BRICKS countries is 195, 75, 450, 600, 500 and 250 respectively. The market indexes which have been used for evaluations are: Brazil Bovespa (Brazil), Russia RTS index (Russia), BSE-200 index (India), Shanghai SE A share (China), KOSPI (South Korea) and FTSE/JSE Africa ALL SHARE (South Africa). The companies account for a reasonable part of market capitalization and trading activity in their respective markets. Hence, the data set fairly represents market performance.

Monthly share prices for estimation purposes and further analysis have been converted to percentage monthly return series. The stylized portfolios (Double and Triple sorted portfolios) are formed on basis of past percentage returns and company characteristics such as the Size, Price to Book (P/B) ratio, Price to Earnings (P/E) ratio, Dividend Yield and Past Sales Growth (estimated as compounded value of Net Sales). 91-day treasury bills for each country have been used as risk free proxy. Value-weighted market index has been used as surrogate for aggregate economic
wealth. Data for above said firm characteristics and market index has also been obtained from Thomson & Reuters DataStream.

For evaluation of prior return patterns in sector, industry group and industry level, Global Industry Classification System (GICS) has been used in the study. It is an industry classification system, developed by Standard & Poor's (USA) in collaboration with Morgan Stanley Capital International (MSCI). GICS was developed in response to the financial community’s need for one complete, consistent set of global sector and industry definitions. The GICS standard can be applied to companies globally, in both developed and developing markets. GICS comprises of 10 sectors, 24 industry groups, 68 industries and 154 sub-industries. The 10 prominent sectors are Energy, Materials, Industrials, Consumer Discretionary, Consumer Staples, Health Care, Financials, Information Technology, Telecommunication Services and Utilities. The data for sector, industry group and industry classification has been obtained from World Scope, Reuters Financials & Compustat Global.

1.5. METHODOLOGY

The research has been carried out in three phases. In phase one, short-term prior return patterns in stock and sector returns have been evaluated for India and then for BRICKS emerging markets. The individual securities are sorted in three ways, first on basis of past excess returns, (Return Portfolios), second on basis of company characteristics such as size, price to book (P/B) ratio, price to earnings (P/E) ratio, dividend yield, past sales growth (PSG) and past excess returns, (Double Sorted Portfolios) and thirdly on basis of size and price to book (P/B) ratio and past excess returns and, size and price to earnings (P/E) ratio and past excess returns, (Triple Sorted Portfolios). Past sales growth is computed as compounded growth rate in net sales three periods prior to portfolio formation.

The portfolios are based on (i months/j months) strategy where, i months involve portfolio formation and j months represent portfolio holding period. Calendar year has been followed from January to December. Two investment strategies namely 6 month – 6 month (6-6) and 12 month – 12 month (12-12) have been employed and the mean excess returns on unadjusted basis are examined for both the investment strategies. Next, testing of asset pricing theory has been done to check if the models can absorb
the extra normal profits. CAPM of Sharpe (1964) and Lintner (1965), and the Fama French three-factor model (1993) are two theories, which try to explain cross section of average stock returns. Further, prior return patterns in sector returns have been formed and test whether prior return patterns in stock returns can be captured by those of sector returns. Lastly, a four factor model has been formed by augmenting the Fama French risk factors (market, size and value) and the fourth additional factor of sector prior return factor, constructed by taking the difference in returns of winner and loser sector portfolios on period to period basis.

In phase two, the study attempts to evaluate long-term (24-60 months) prior return patterns in stocks and sector returns for India and then the work is extended to BRICKS countries. Single, double and triple sorted portfolios are formed as done in phase one of the study. The portfolios are based on (i months-j months-k months) strategy where i months involve portfolio formation period, ranging from 24-60 months, j months represent the 12 months that are skipped between portfolio formation and portfolio holding period, while k is fixed at 12 months as portfolio holding period. The 12 months are skipped between portfolio formation and holding windows (as suggested by Fama and French (1996)) to control for any short-term momentum patterns that may hamper any clear discerning of long-term prior return patterns. Calendar year i.e. from January to December has been followed for evaluation purpose. Further, standard risk models such as single factor (CAPM) and multi-factor (Fama-French three-factor) models are used to test whether they can explain long-term prior return patterns. Also, tests have been conducted to observe if the stock prior return effect is an outcome of sector prior return effect and can the sector information be used as a risk factor to form a four-factor model such that it is able to explain returns.

Lastly, in phase three, prior return patterns in sector returns have been evaluated for BRICKS at all the three levels, that is, sector, industry group and industry and how these patterns differ for short-term (6-12 months) and long-term (24-60 months) portfolio formation windows. Two types of strategies have been employed (i) short-term strategies, 6 months-6 months (6-6) and 12 months-12 months (12-12), and (ii) long-term strategies with skipping one year between portfolio formation and holding periods, 24 months-12 months -12 months (24-12-12), 36 months-12 months -12 months (36-12-12), 48 months-12 months -12 months (48-12-12), and 60 months-12 months -12 months (60-12-12).
months -12 months (60-12-12). The 12 months have been skipped to control for any short-term prior return effects as it may hamper any clear judgment of returns, suggested by Fama and French (1996). Further, sector growth rates have been estimated to test whether it can explain risk. Lastly, the role of sector factor in stock returns has been evaluated by running regressions considering zero-investment prior return stock portfolio as independent variable and zero-investment prior return sector portfolio as the dependent variable.

1.6. SUMMARY OF EMPIRICAL RESULTS

In phase one, short-term momentum patterns in stock and sector returns have been studied for India. Specifically it is observed that,

- Strong momentum patterns are there in stock returns for prior returns sorted portfolios which are stronger for 6-6 compared to 12-12 investment strategy.
- Further, company characteristics such as size, P/B and P/E help in designing momentum trading strategies which result in higher profits vis-à-vis single sorted (prior return) portfolios.
- The risk models, Capital Asset Pricing model (CAPM) and Fama French three-factor model fail to capture momentum profits for the Indian market.
- Strong momentum patterns are observed for sector returns to an extent that two-thirds of stock momentum in India is an outcome of sector momentum.
- It can be concluded that sector selection seems more important than security selection while developing trading strategies for India.

The work on short-term formation windows has been extended from Indian market to Brazil, Russia, India, China, South Korea and South Africa (BRICKS) emerging markets. The results are as follows:

- Employing 6-6 portfolio formation/holding strategies, strong momentum patterns are observed for the sample countries with exception of China.
- When the formation windows are elongated from 6 to 12 months, the momentum patterns dissipate and reversal patterns emerge for some countries.
• Characteristic sorted portfolios based on company characteristics size, P/B and P/E result in higher profits as compared to single sorted (prior return) portfolios.

• CAPM was able to explain prior return patterns for most of the portfolios of Brazil, China and South Africa.

• Fama French model fails to capture prior return patterns for 6-6 strategies, however does a good job in case of 12-12 strategies for Brazil, China, South Korea and South Africa.

• There are prior return patterns in sector returns as was observed in case of stock returns.

• The four factor model with sector momentum as an additional factor is a better descriptor of asset pricing but some unexplained returns may warrant a behavioral explanation.

In the next phase, long-term (24-60 months) prior return patterns in stock and sector returns are examined for India. 12 months have been skipped between portfolio formation and holding windows to control for short-term momentum effects (up to 12 months). Following observations have been made for long-term formation windows:

• Contrarian profits emerge for almost all the test portfolios for long-term investment strategies.

• Stylized portfolios give lower returns in most of the cases with few exceptions.

• The risk model CAPM is a poor descriptor for explaining returns; however Fama French model is able to capture long-run prior return patterns except for 36-12-12 strategies.

• Strong momentum patterns are observed for long-term formation windows as compared to short-term windows.

• The sector factor partially absorbs the prior return patterns in sector returns.
Further, evaluation of long-term prior return (24-60 months) as well as company characteristics and prior return based portfolios for BRICKS markets has been carried out. It leads to the following results:

- For prior return and characteristic sorted portfolios, Brazil, Russia and South Africa report momentum behavior while India, China and South Korea exhibit reversal patterns.
- CAPM is a poor descriptor for India and South Korea and works well for 24 and 36 portfolio formation windows of other markets.
- The Fama French model is able to explain most of the extra normal returns except for 24-12-12 strategy in case of China and South Africa and 36-12-12 strategy for India.
- There are long-term prior return patterns in sector returns.
- The sector factor is able to capture average returns for 36-12-12 strategy of India and 24-12-12 strategy of South Africa; however returns for 24-12-12 strategy of China cannot be explained and thus may owe a behavioral explanation.

In the last phase, prior return pattern for sector, industry group and industry returns for BRICKS markets have been conducted. Concluding the results of the study:

- For short-term portfolio formation windows, India and South Africa report momentum behavior whereas South Korea shows reversals.
- For long-term formation windows (up to 60 months), Brazil exhibits momentum patterns which disappears for 60-12-12 strategies. For India and Russia, momentum patterns continued even for long-term portfolio formation windows. South Korea, South Africa and China show weak reversals for long-term portfolio formation windows.
- The sector factor is constructed based on the argument of Liu and Zhang (2008) which states that winner sector exhibits higher risk owing to stronger growth potential. It is observed that a large part of prior return patterns in stock returns is absorbed by similar patterns in sector returns.
1.7. RELEVANCE OF THE STUDY

The source of prior return profits still remains an asset pricing anomaly. Recent work on asset pricing literature has focused on studying of prior return patterns in stock returns and individual company characteristics. The evidence for prior return patterns in sector returns is very limited and needs further testing. The following arguments will suffice the importance of this research, its contribution to asset pricing and behavioral finance literature and its relevance for the BRICKS economies with emphasis on India.

- The present study is important as it will test prior return patterns in stock and sector returns for emerging markets of BRICKS.

- Researchers have observed that diversified portfolios formed on valuation and capitalization based characteristics yield significant profits. In the context, the present study will test for prior return patterns by forming double and triple sorted stylized portfolios based on company characteristics (size, P/B, P/E, dividend yield and past sales growth) and past returns.

- There are prior return patterns in sector returns as is observed for stock returns. In the study, three levels of industry classification, sector, industry group and industry have been tested for prior return patterns. The three level classifications have been studied as one may discern different prior return patterns at each stage of industry classification.

- The present study will attempt to provide a more meaningful risk factor (sector prior return factor) which has a strong economic foundation as it is able to capture prior return patterns in sector returns.

- The present research will use the information about sector factor (formed on basis of argument of Liu and Zhang (2008)) to develop a four factor model by replacing stock momentum factor of Carhart model.

- The results contribute to the asset pricing anomaly literature and behavioral finance literature especially for emerging markets and have implications for portfolio analysis and management in the Indian context.

- The findings are relevant for global portfolio managers, investment analysts as well as for institutional and individual players who are on the look out for
developing portfolio trading strategies especially for emerging markets given their low degree of co-relation with the mature markets.

1.8. ORGANIZATION OF THE STUDY

The study comprises of eight chapters including the present one. Chapter 2 provides theoretical framework of asset pricing and covers a detailed review of literature on important asset pricing anomalies with special focus on prior return anomalies i.e. contrarian and momentum patterns. Short-term momentum patterns for stock and sector returns in India are analyzed in chapter 3. Similar analysis based on short-term prior return patterns for BRICKS is covered in Chapter 4. Chapter 5 considers the prior return patterns for long-term (24-60 months) formation windows as discussed by DeBondt and Thaler (1985, 1987) with emphasis on India. Long-term prior-return patterns for BRICKS markets have been analyzed in chapter 6. Chapter 7 examines if there are any prior returns patterns in sector returns for BRICKS markets and whether prior return patterns in stock returns are absorbed by sector patterns. Summary, concluding remarks and directions for future research are provided in the last chapter.