CHAPTER 1
INTRODUCTION

1.1 BACKGROUND OF THE STUDY

Schwert (2003) defines anomalies as empirical results which are incompatible with maintained theories of asset pricing behavior. Asset pricing describes the relationship between risk and return for a given financial asset. The single factor Capital Asset Pricing Model (CAPM) of Sharpe, 1964 and Litner, 1965 which posits a positive and linear relation between beta and security returns has been the foundation of all asset pricing models. It postulates that the relevant risk is systematic in nature and measured by beta.

However empirical research that followed observed that that much of the variation in expected return is unrelated to market beta and various company characteristics viz. size, book to market equity, earnings to price and leverage and prior return patterns could affect stock returns. Major CAPM anomalies are firm size (Banz, 1981), book equity to market equity (Stattman, 1980), price earnings (Basu, 1983), firm leverage (Bhandari, 1988), reversal (De Bondt & Thaler, 1985, 1987) and momentum returns (Jegadeesh & Titman, 1993).

Hence it was well established that beta is inadequate to explain returns and thus there is need to develop multifactor asset pricing models. Fama and French (FF) (1993) developed a three-factor asset pricing model for expected returns, which suggests that expected returns on a portfolio in excess of the risk-free rate are explained by sensitivity to market, size and value factors. The additional risk factors i.e. size and value have empirically exhibited an impressive power in explaining major anomalies of the CAPM for instance size, book to market, earnings to price, leverage. However despite its superior performance, the model is lacking in underlying theory (see Rahim & Mohd.Nor, 2006). Recent evidence confirms that even the FF model is not without limitations. For instance, the model fails to explain returns on portfolios sorted on momentum (Fama & French, 1996), liquidity (Brennan, Chordia & Subrahmanyam, 1998; Brennan and Subrahmanyam, 1996), accruals (Sloan, 1996),
profitability (Fama & French, 2008) and net stock issues (Ikenberry, Lakonishok & Vermaelen, 1995; Loughran & Ritter, 1995). Fama and French (2008) point out that their model fails to explain returns on portfolios sorted on accruals, momentum and net stock issues in all size groups.

Stock market anomalies that have gained attention in the literature over the past few years are size, value, prior return patterns (momentum/contrarian), liquidity, accruals, profitability and net stock issues. The size effect means that small firms stocks provide higher risk adjusted returns than the stocks of large firms (Banz, 1981). The value effect implies that companies with relatively high distress (persistently low sales and earnings record) tend to outperform companies which are relatively better performing (persistently high sales and earnings record) (Statman, 1980). Prior return patterns can be classified into momentum and contrarian. Momentum implies that trading strategies that buy stocks with high returns and sell stocks with low returns over the previous 3-12 months generate significant profits (Jegadeesh & Titman, 1993). Contrarian strategies are based on price reversal i.e past losers are future winners (De Bondt & Thaler, 1985, 1987). Empirical literature has been conclusive that momentum patterns are short term whereas contrarian patterns are observed for long term formations. Amihud and Mendelson (1986) show that investors demand a premium for less liquid stocks so expected returns should be negatively related to the level of liquidity. Sloan (1996) shows that low (high) accrual stocks generate positive (negative) abnormal future returns. Haugen and Baker (1996) and Fama and French (2008) find that more profitable firms tend to have greater expected returns. The net stock issues anomaly refers to the negative relation between net changes in equity financing and future stock returns (Loughran & Ritter, 1995 and Ikenberry, Lakonishok & Vermaelen, 1995).

Existence of anomalies would not be possible in an efficient stock market\(^1\) where securities are correctly priced and return is dictated by the amount of risk (as per chosen asset pricing framework i.e. CAPM or multi factor asset pricing model). However the presence of anomalies doubts the concept of an efficient market and

\(^{1}\) The CAPM was followed by the work of Fama(1970) to formulate the Efficient Market Hypothesis(EMH). The EMH maintains that market prices fully reflect all available information.
provides an avenue to investors to earn extra normal returns on various characteristic sorted portfolios.

Extensive literature exists confirming the presence of the above prominent stock market anomalies and the feasibility of exploiting them to earn abnormal returns for mature markets. Similar evidence for emerging markets including India is limited and more recent in origin.

The term emerging markets was first introduced in 1980 by World Bank economist Antoine van Aytemel as nations undergoing rapid economic growth and industrialization. Noeth and Sengupta (2012) define emerging markets as countries which experience significant growth in GDP and infrastructure and have adopted structural economic reforms to catch up with the developed world. Four fast growing emerging markets viz. Brazil (B), Russia(R), India (I) and China(C) were together termed as BRIC by Jim O’Neill, a Goldman Sachs executive. He proclaimed that these emerging markets could help drive global markets and world economic growth. The share of BRIC in global GDP increased from 8% in 2000 to 17.2% in 2010 (World Economic Outlook, IMF, 2010). Recently the investment banking industry has included Indonesia, South Korea and South Africa in the emerging markets group. Indonesia and South Korea were added in 2010(see Global Development Horizon, World Bank, 2011). South Africa was added into the group in 2011.

By 2025, six major emerging economies viz. Brazil, Russia, India, Indonesia, China and South Korea will collectively account for more than half of all global growth (see Global Development Horizon, 2011). Many of these emerging countries during early 1990s followed liberalization policies and transformed the financial system by opening the stock market to foreign investors. This led to greater capital flows to these countries leading to growth of capital markets in the form of greater stock listings, market capitalizations and trading volumes. Over the long term, equity indices in emerging markets have produced better returns than the developed markets2. Economic progress is taking place in the emerging markets at an accelerated pace due partly to technical advancements, sound economic policy making and

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2 The equity market indices of Brazil, Russia, India and China have outperformed the equity indices of G7 countries for the period from January 1, 2000 to December 5, 2011 (S&P).
reduction in poverty as a result of health, education and other social reforms. Favorable demographics and expectations of high economic growth have made these markets popular investments.

However it should be kept in mind that although emerging markets offer a high potential of return to investors, they are highly risky. These securities are volatile, less liquid, subject to substantial currency fluctuations and sudden economic and political developments. The successful implementation of stock selection strategies in emerging markets could be hindered by transaction costs, short selling constraints, and policy implementation delay. In addition, differences exist among these countries w.r.t political system, exchange rate regime and regulations on international capital mobility. Also the investor behavior in emerging markets may be different from that in developed markets.

With liberalization and globalization, investors tend to diversify their portfolios by participating in developed as well as emerging markets. Thus emerging markets have gained significance in the context of international investment portfolios and diversification process. Literature exists to show diversification benefits from emerging equity markets (see Bailey & Stultz, 1990; Bekaert & Uris, 1996; Bekaert & Harvey, 2003; Harvey, 1995). These studies state that portfolio risk can be reduced by including emerging market securities in diversified portfolio since emerging markets tend to have low correlation with developed markets thus leading to overall risk reduction benefits to portfolio, even though held alone the emerging markets equities are more volatile vis-à-vis industrial market equities. Naranjo and Porter (2007) find that diversification benefits are greater when emerging markets are added in the portfolio as compared to including developed markets. Li, Sarkar and Wang (2003) find that most emerging markets have low correlations among themselves, which means that investors may benefit from taking long positions in emerging markets.

The study of stock market anomalies in these emerging markets has primarily focused on size, value, prior return patterns and accruals (see Bonomo & Dall'Agnol, 2003; Braga & Leal, 2000; Cupertino, Martinez & Costa Jr, 2012; Machado & Mediros, 2012 for Brazil, Wang & Chin 2004; Wang & Xu, 2004, Naughton, Truong, & Veeraraghavan, 2008;

The relationship between various company characteristics and stock returns should be examined for emerging markets in the context of multi factor asset pricing framework which will help in supporting investment decisions for the domestic investor and decisions regarding international portfolio diversification for the global investor.

The remainder of the chapter is organized as follows. The next section gives the rationale of the study. Section 3 provides the objectives of the research while Section 4 states the testable hypotheses. A brief description of data and their sources has been provided in Section 5. Methodology used in the research is described in Section 6. Section 7 gives the summary of research findings and Section 8 gives the relevance of the research. The last section gives the organization of the study.

**1.2 RATIONALE OF THE STUDY**

Asset pricing anomalies are important to both researchers and investors. Researchers are interested in anomalies because they challenge the existing theory that cross sectional differences in expected returns are due to differences in risk. On the other hand investors are on the watch out for trading strategies that can continuously beat the market.

This study is guided by the work of Fama and French (2008) who explore the pervasiveness of five return anomalies viz. net stock issues, accruals, momentum, profitability and asset growth for the US market. The existing research on stock market anomalies for the Indian market is thus far limited. Presently only the size anomaly, value anomaly and prior return patterns (momentum/contrarian) have been recognized and studied for the Indian market (see Kumar & Sehgal, 2004; Mohanty, 2002; Sehgal & Balakrishnan, 2008; Sehgal & Jain, 2011; Sehgal & Tripathi, 2005,
2006, 2007). Literature on accruals and stock issues anomalies is relatively thin (see Leippold & Lohre, 2010; Pincus, Rajgopal & Venkatachalam, 2007 for accruals and Mc Lean, Pontiff & Watanabe, 2009 for stock issues anomalies respectively). Liquidity, profitability and stock repurchases anomalies are still unexplored. The study shall fill this important void in the literature. This study shall test the presence of following asset pricing anomalies in Indian stock market viz. size, value, momentum, liquidity, accruals, profitability, stock issues and stock repurchases and examine if these anomalies could be explained by single factor CAPM. If CAPM is unable to explain these anomalies they will be subject to multifactor asset pricing framework consisting of the three factor Fama French model.

For the sake of direct comparison, the study selected four of the same set of variables used by Fama and French (2008) i.e momentum, accruals, profitability, net stock issues anomalies(Net stock issues anomaly will be examined separately as stock issues anomaly and stock repurchases anomaly in this study). Liquidity anomaly has been investigated for India since it has been proved to be an important anomaly in case of mature markets. In addition the size and value anomalies have been tested for a recent sample period.

The stock issues anomaly for the Indian market has been studied by Mc Lean, Pontiff and Watanabe, 2009 from 1991-2006 using Fama and McBeth(1973) methodology. In this research the relation between stock issues and returns will be tested by use of the sorting technique of Fama and French (1993) for a more recent time period. Next the research will focus on two anomalies in greater detail for the Indian stock market viz. accruals anomaly and the profitability anomaly for reasons explained below.

The value relevance of earnings persistence and the cash flow and accrual components of earnings has been extensively examined in the developed markets. There is meager evidence for emerging market like India. Hence the study investigates the persistence of earnings reported by firms in the sample and tests whether earnings persistence is more attributed to cash flow or accrual component of earnings. It is also examined if information intermediaries in India anticipate the information in earnings persistence and whether investors price accruals and cash
flows relative to their contribution in projection of one year ahead earnings. Although Pincus, Rajgopal and Venkatachalam (2007) and Leippold and Lohre (2010) include the Indian case to study the accrual anomaly, they cover an earlier time period. Here the accrual anomaly will be re-examined for a longer time period including the more recent time period. However the most important contribution of the study will be the test of the presence of cash flow anomaly which has till now not been researched in the Indian context.

Existing research on profitability anomaly for mature markets analyses relationship between profitability and returns from the point of view of the firm. They thus explain profits as reward for risk bearing. A study of profitability anomaly in Indian context has not been conducted thus far. To fill this gap in the literature the study shall examine the profitability anomaly in the Indian stock market and explore the relationship between profitability and returns from an alternative perspective viz. from the perspective of the investor who is in pursuit of trading strategies to earn extra normal returns.

Existing literature has tested the asset pricing anomalies in the Indian context using one factor CAPM, three factor FF model and augmentation of FF model with Carhart factor and sector momentum factor. In this study an attempt is made to augment the three factor FF model with additional risk factor(s) viz. liquidity, sector momentum and earnings momentum factors, which could improve the explanatory power of the FF model.

Literature has found liquidity to be a significant risk factor in explaining returns in addition to size and value in the Fama French model (Bali & Cakici, 2004; Chan & Faff, 2005; Keene & Peterson, 2007; Miralles & Miralles, 2006; Pastor & Stambaugh, 2003). The present study evaluates the role played by the liquidity factor in explaining cross section of returns. A body of research debates the importance of industry or sectors in explaining momentum (Griffin, Ji & Martin, 2003; Grundy & Martin, 2001; Liu & Zhang, 2008; Moskowitz & Grinblatt, 1999). Following Liu and Zhang (2008) and Sehgal and Jain (2011) the sector momentum factor will be used to augment the liquidity augmented FF model. Another argument in asset pricing literature relates to
an earnings momentum factor used to explain price momentum (Chordia & Shivkumar, 2006). This provides an impetus to incorporate earnings momentum as an additional risk factor in the FF model to explain price momentum.

Furthermore, the international investor would like to diversify his portfolios across mature as well as emerging markets to earn abnormal returns on various characteristic sorted portfolios. However, there is no study which undertakes a systematic and comprehensive coverage of major anomalies across select emerging markets. Existing literature either focuses on a single anomaly for a group of markets or a cluster of anomalies for a single market. To bridge this gap in the literature in this study, the prominent asset pricing anomalies viz. size, value, short term prior return patterns, liquidity, accruals, profitability, stock issues, and stock repurchases shall be studied for the select emerging markets viz. Brazil, India, Indonesia, China, South Africa, and South Korea\(^3\) (returns denominated in USD as this provides a uniform medium in which to compare performance). The anomalies would be tested using single factor CAPM and three factor FF model. An additional contribution of the work will be use of the liquidity augmented Fama French model to explain cross section of returns.

This study is therefore significant as it aims to fill gaps in the asset pricing and behavioral finance literature by testing unexplored anomalies (liquidity, profitability, and stock repurchases), conducting an in-depth analysis of accruals and profitability anomalies, testing additional risk factor(s) to augment FF model for the Indian market and a comparative analysis of prominent anomalies across select emerging markets for the global investor.

1.3 OBJECTIVES OF THE STUDY

The study attempts to achieve the following objectives:

- To evaluate the relationship between the following company attributes viz. size, value (price to book), liquidity, accruals, profitability, stock issues, stock

\(^3\) These markets form part of BRIICKS, an important emerging markets basket. Russia has been excluded due to lack of adequate data.
repurchases and stock returns and short term prior return patterns and stock returns for the Indian stock market.

- To investigate if the cross section of average stock returns on the above mentioned characteristic sorted portfolios can be explained by risk models i.e. CAPM, three factor Fama French model and augmented Fama French models.

- To understand investor behaviour in Indian market w.r.t information contained in accruals and the subsequent effect of this on relationship between accruals and stock returns.

- To investigate if the relationship between profitability and stock returns in India reflect firm or investor perspective.

- To examine the relationship between the following company attributes viz. size, value, liquidity, accruals, profitability, stock issues and stock repurchases and stock returns and short term prior return patterns and stock returns for select emerging markets from a global investor’s perspective. The emerging markets studied will be Brazil, India, Indonesia, China, South Korea and South Africa.

- To investigate if the cross section of average stock returns on the above mentioned characteristic sorted portfolios for sample emerging markets can be explained by risk models i.e CAPM, Fama French model and liquidity augmented FF model.

1.4 TESTABLE HYPOTHESES

The study attempts to test the following hypotheses:-

- Small stocks have higher average stock returns.

- Stocks with high ratio of book value to market value of equity (BE/ME) ((low price to book (P/B) ratio) have higher stock returns.

- There is a short term momentum pattern in stock returns upto 6 months.

- There is a short term momentum pattern in stock returns upto 12 months.

- There is a negative relation between liquidity and average returns.
• Stock returns are negatively related to accruals.
• Stock returns are positively related to cash flows.
• There is persistence in current earnings performance.
• Current earnings performance is less persistent if it is attributable to the accruals component of earnings than to the cash flow component of earnings.
• Stock prices anticipate the average persistence of earnings performance.
• The earnings expectations rooted in stock prices fail to reveal fully the higher earnings persistence attributable to the cash flow component of earnings and lower earnings persistence attributable to the accruals component of earnings.
• The cash flow anomaly is captured by standard risk models like CAPM or FF three factor model.
• There is a positive relation between average returns and profitability.
• More profitable firms pay higher dividends.
• There is an inverse relation between dividend payouts and systematic risk.
• Small and low P/B firms pay low dividends.
• There is a negative relation between stock issues and average returns.
• There is a positive relation between stock repurchases and average returns.
• Cross section of average stock returns is not explained by CAPM.
• The Fama French model provides a better explanation of the cross section of average stock returns compared to one factor CAPM in India.
• The four factor liquidity augmented Fama French model provides a better explanation of the cross section of average stock returns compared to three factor Fama French model in India.
• The five factor model i.e. Sector momentum augmented liquidity augmented FF model provides a better explanation of the cross section of average stock returns compared to the four factor liquidity augmented FF model.
• The five factor model i.e. earnings momentum augmented liquidity augmented FF model provides a better explanation of the cross section of average stock returns compared to the four factor liquidity augmented FF model.

• There is a statistically significant relationship between company fundamentals viz. size, value (price to book), liquidity, accruals, profitability, stock issues and stock repurchases and stock returns and short term prior return patterns and stock returns for the sample emerging markets.

• The liquidity augmented Fama French model can better explain cross section of equity returns than three factor Fama French model and one factor CAPM for the sample emerging markets.

1.5 DATA

The data used in the study has been discussed in two parts. The first part is with reference to study on equity market anomalies for the Indian stock market and the second part is for study of equity market anomalies for sample emerging markets.

The data used for study of equity market anomalies for the Indian stock market (i.e. for Chapters 4, 5 and 6) is described as follows. The study uses month end closing adjusted share prices (adjusted for capitalization such as bonus, rights and stock splits). The sample used consists of 493 companies that form part of BSE-500 equity index from Jan 1996 to Dec 2010 (180 monthly observations). The Bombay Stock Exchange (BSE) -200 index is used as the market proxy.

Various company characteristics which are used to form "stylized portfolios" are as follows. Market capitalization (as size proxy) is total market value of all of a company’s outstanding shares. Price to book value (inverse of (BE/ME) as value proxy) per share represents the security price over a company’s book value. The liquidity proxy is the average daily turnover in percentage during the portfolio formation period, where daily turnover is the ratio of the number of shares traded each day to the number of shares outstanding at the end of the day (Lee & Swaminathan, 2000). Return on equity (as a measure of profits) is calculated as the income available
to common stockholders divided by the common equity. Return on assets (as a measure of profits) is calculated as net income scaled by average total assets. Accruals have been calculated using the balance sheet method (Sloan, 1996). Relation between average returns and stock issues and stock repurchases is captured by the net stock issues variable. Net stock issues is the natural log of ratio of split adjusted share outstanding at calendar year end t-1 divided by split adjusted shares outstanding at calendar year end in t-2. The firm’s dividend payout ratio has been used to represent the dividend decision. Dividends payout ratio is calculated as equity dividend that is paid to equity share owners as a percentage of total profit after tax.

The implicit yields on 91-day treasury bills have been used as risk-free proxy as is the standard practice in finance literature. Global Industry Classification System (GICS) has been used for sector classification to form winner minus loser (WML) factor of sectors. GICS comprises of 10 sectors, namely Energy, Materials, Industrials, Consumer Discretionary, Consumer Staples, Health Care, Financials, Information Technology, Telecommunication Services and Utilities.

Data on share prices, market index, all company characteristics and sector classification has been obtained from the Thomson One database of Thomson Reuters. Data on dividends payout ratio has been obtained from CMIE-Prowess. The data on 91-day treasury bills has been taken from the RBI monthly handbook of statistics and RBI website. All variables are measured in INR.

The research covers six emerging markets viz. Brazil, India, Indonesia, China, South Korea and South Africa (Chapter 7) from Jan 1994 to Dec 2011. The study periods for sample countries are different based on availability of adequate data. The largest sample has 204 monthly observations and the smallest has 124 monthly observations. For each country, the study uses month end closing adjusted share prices, adjusted for capitalization such as bonus, rights and stock splits. The month end share price series has been converted into percentage return series for further estimation. The market indices which have been used for evaluation are IBX (Brazil), BSE-200(India), JK-Composite (Indonesia), Shanghai SE Composite (China), Kospi Composite (South Korea) and J-203-JO (South Africa).
Market capitalization is used as the size proxy. Price to book is used as the proxy for the value factor. Liquidity is measured by average daily turnover (Lee & Swaminathan, 2000). Accruals are measured using the balance sheet definition (Sloan, 1996). Profitability is proxied by ROE and ROA. Net stock issues are same as defined for the study on the Indian stock market.

Data on share prices, market index and all company characteristics for all sample countries has been obtained from the Thomson One database of Thomson Reuters. In case of Brazil, data on price to book was taken from Bloomberg since it provided data for the entire sample period. For Indonesia, data was inadequate to form repurchases sorted portfolios. Risk free rate is proxied by the 91 day US Treasury bill rate, data on which has been obtained from Federal Reserve Bank of St.Louis website. All variables are measured in USD rather than local currency.

1.6 METHODOLOGY

The study has been conducted in four phases and the methodology for each phase will be discussed separately.

Phase 1

In phase one asset pricing anomalies for Indian stock market have been tested. Single sorted portfolios have been formed based on each stylized characteristic viz. size, price to book, liquidity, accruals, profitability, stock issues, stock repurchases and short term prior return patterns. An i months/j months investment strategy is defined as one which involves i months of portfolio formation and, j months of portfolio holding period. The 12 months/12 months investment strategy is evaluated for all the characteristic sorted portfolios and an additional 6 months/6 months strategy for short term prior return patterns (momentum) sorted portfolios. The 12-12 strategy for individual stocks is estimated as follows: In December of year t-1, the securities are ranked on the basis of the stylized characteristic under consideration. The ranked securities have been classified into five portfolios P1 to P5 and equally-weighted monthly excess returns estimated for these portfolios for the next 12 months (t). All
available stocks have been independently sorted into quintiles based on each variable of interest. Unadjusted excess returns are calculated on the characteristic sorted portfolios. Next the returns on characteristic sorted portfolios are subject to asset pricing models to evaluate if the models could absorb the extra normal profits. CAPM and Fama French models are used for this purpose. If returns are left unexplained by FF model then a four factor model with liquidity as an additional explanatory variable has been used in the Fama French regression to explain the cross section of stock returns (Pastor & Stambaugh, 2003). Average size, P/B and liquidity values are calculated for corner portfolios formed on all company attributes and short term prior return patterns. Next, augmentation with the sector momentum factor (Sehgal & Jain, 2011) and earnings momentum factor (Chordia & Shivkumar, 2006) is done one at a time in the liquidity augmented Fama French model to test if they are able to capture better the cross section of returns left unexplained by the prior models.

Phase 2

In the second phase a detailed study of the accruals and cash flows anomalies in Indian stock market is undertaken. The accrual anomaly is evaluated from a behavioural point of view. The objective is to test if investors in India are able to differentiate between the persistence of accruals and cash flows in next year’s earnings and whether this gets reflected in share prices. The persistence of current earnings on future earnings and the differential persistence of accruals and cash flows components of earnings are tested using panel OLS regressions following Sloan (1996). Next to test if stock prices correctly anticipate average persistence of earnings performance and whether implications of accruals and cash flows for persistence of earnings are reflected in share returns, the study applies Mishkin test as discussed in Sloan(1996) and Kraft, Leone and Wasley(2007). The two systems of equations are estimated using nonlinear GLS. Market efficiency is tested using Likelihood Ratio test statistic. While the Mishkin test identified whether the accrual anomaly exist in a statistical sense, it provides no indication of its economic significance. To address this asset pricing tests are conducted next. It is assessed whether the accruals trading strategy is robust to return predictability associated with CAPM beta and three factor
Fama French model. Asset pricing tests of CAPM and Fama French model are conducted to test if the cross section of returns on cash flows sorted portfolios are explained.

**Phase 3**

In the third phase a study of the profitability anomaly for the Indian stock market is conducted. Profitability is measured by ROE and ROA. First unadjusted excess returns are estimated on profitability sorted portfolios (ROE and ROA). To estimate relationship between dividend payouts and profitability a panel OLS regression is estimated, where the dividend payout is the dependent variable and the explanatory variable is profits. Next CAPM regressions are run on profitability sorted portfolios to check if extra normal returns are explained by the market factor. To investigate the relationship between beta and dividend payouts, stock beta is estimated for each individual firm by regressing a firm’s excess monthly stock return against the excess market returns. Once the value of beta is available for each firm over the entire sample period, the relation between beta and payouts is estimated using panel OLS. Average value of dividend payouts for corner portfolios sorted on profitability are calculated.

It is evaluated if the excess returns of the stylized portfolios that are missed by CAPM can be explained using the three factor model of Fama and French. To develop a risk story for size and value factors, panel OLS regression is estimated between dividend payouts and size and dividend payouts and value factor. It is then verified if the corner portfolios (P1 and P5) comprise of stocks with particular attributes i.e. small (big) size, low (high) P/B ratio.

**Phase 4**

In the last phase of research the test of equity market anomalies is conducted for select emerging markets viz. Brazil, China, India, Indonesia, South Africa and South Korea. Single sorted portfolios are formed on various company attributes viz. size, price to book, liquidity, accruals, profitability, stock issues, stock repurchases and
short term prior return patterns. Asset pricing tests viz. single factor CAPM and multifactor models i.e. three factor Fama French and liquidity augmented Fama French model are conducted as in Phase 1 of the study.

1.7 SUMMARY OF EMPIRICAL RESULTS

The results obtained in the study are discussed for each phase separately.

Phase 1

In phase 1 equity market anomalies have been studied for India.

- The empirical results confirm the presence of asset pricing anomalies in the Indian context.

- A negative relation between size and returns and between price to book and returns is obtained which confirms with results for mature markets.

- Strong momentum profits are observed on both 6/6 and 12/12 strategies.

- Relation between liquidity and returns is negative and that between repurchases and returns is positive which confirms with results for mature markets.

- Positive relationship is reported between accruals and returns, stock issues and returns and a negative relation between profitability and returns which is in contrast to results for mature markets.

- It is observed that on an unadjusted returns basis the size effect is the strongest followed by momentum.

- The CAPM is able to explain the cross section of returns on stock issues and stock repurchases sorted portfolios.

- Returns on value, accruals and profitability sorted portfolios are captured by FF model.

- However size, momentum and liquidity anomaly defy Fama French model.
• The liquidity augmented FF model is able to mop up all the extra normal returns on the liquidity sorted portfolios as well as 40% of the returns on the smallest stock portfolios. Thus the four factor Liquidity Augmented FF seems to be a better descriptor of asset pricing compared to one factor CAPM and three factor Fama French model in India.

• When sector momentum is added as a risk factor in the liquidity augmented FF model, it is unable to explain the residual size effect and momentum. When liquidity augmented FF model is augmented with earnings momentum factor, it is found that profits based on small stock portfolio are still unexplained and abnormal returns from momentum strategy still persist.

• Thus size and momentum persist as asset pricing anomalies.

• Persistence of size, momentum and liquidity anomalies may suggest role for additional risk factors in returns in Indian context beyond what is proposed by CAPM.

**Phase 2**

The second phase of study is on accruals anomaly and cash flows anomaly in the Indian stock market.

• A negative relation is found between accruals and cash flows which is consistent with existing studies. Earnings are positively related with accruals and cash flows.

• Results show a high level of earnings persistence.

• Stock prices correctly reflect the information contained in current annual earnings about future annual earnings.

• Evidence shows that accruals are less persistent than cash flows in shaping future earnings.
- On average investors in India under price the information in accruals component of earnings and overprice the information in cash flows component of earnings, which is in contrast to findings for mature markets.

- Accruals are positively associated with average returns in contrast with results for mature markets where such relationship is reported to be negative.

- The accruals anomaly which is not captured by one factor CAPM is fully explained by three factor FF model due to risk premiums on size factor.

- The returns are found to be negatively related to level of cash flows which is in contrast to results obtained for mature markets.

- The cash flows anomaly which is again missed by CAPM is explained by FF model.

**Phase 3**

A study of the profitability anomaly in India is conducted in phase 3 of the research.

- Results show a negative relationship between profitability and returns which is robust to choice of profitability measure i.e ROA and ROE, in contrast to results obtained for mature markets. This relationship could be explained from the perspective of the investor.

- Firms with larger profits (ROA and ROE) are more likely to pay higher dividends while firms with comparatively lower profits would adopt lower payouts. This result is consistent with that obtained for mature markets.

- A profitability anomaly exists within the CAPM framework.

- Market beta for less profitable stocks is higher than for more profitable stocks.

- Negative relation between beta and dividend payouts is empirically confirmed.
• Size and value factors of the Fama French model absorb the profitability anomaly unexplained by CAPM.

• Less profitable firms are found to be relatively distressed and smaller in size.

• Size and value factors of the Fama French model however do not bear significant relationship with payout ratios.

**Phase 4**

Lastly a test of prominent equity market anomalies for select emerging markets has been carried out in phase 4 of the research.

• Using the three factor Fama French model as performance benchmark, results show presence of the size anomaly in India, South Korea and Brazil, value anomaly in South Korea and South Africa, momentum anomaly in India and South Africa, mild reversals in Brazil, liquidity anomaly in India and South Africa, profitability anomaly in Brazil and South Africa, accruals anomaly in South Africa and stock repurchases anomaly in India and South Africa.

• Results confirm the presence of the size anomaly in three countries, value, liquidity, profitability and stock repurchases anomaly in two countries each and accruals anomaly in one country. The results show that momentum anomaly is present in two out of the six countries under study, with one country reporting mild reversals.

• Anomalous returns cannot be earned by trading strategy formed on stock issues in any of the countries under consideration.

• The liquidity augmented FF is a better descriptor of asset pricing compared to one factor CAPM and three factor FF only in the Indian context and does not seem to play any significant role for explaining anomalies in other countries.

• The three factor Fama French model could be used as performance benchmark for all other markets as compared to the one factor CAPM.
• South Africa would serve as the most exciting destination for portfolio managers followed by Brazil, South Korea and India.

• China and Indonesia are the two countries not displaying any anomalous returns and hence would not be of interest to global portfolio managers.

1.8 RELEVANCE OF THE STUDY

The present study is important since it is a comprehensive work testing prominent asset pricing anomalies for select emerging markets, with emphasis on India. The findings of this study are of significant use to investors, equity analysts, mutual fund managers, policy makers, researchers and academicians.

• The study is useful for investors and equity analysts. The results will help in understanding the determinants of stock returns in these markets. This would provide valuable information to domestic investors and equity analysts who would like to develop trading systems to earn extra normal returns on various characteristic sorted portfolios. The findings will be relevant for global portfolio managers, investment analysts as well as for institutional investors in taking decisions about international portfolio construction and diversification.

• The research is also meaningful for mutual fund managers. The results of the study will suggest an augmented FF model as an alternative pricing framework to the three factor FF and one factor CAPM in India. The augmented FF model can be used as a benchmark for mutual fund performance evaluation in India.

• Utility firms and public sector organizations can use the augmented FF model in India to estimate a fair rate of return on their investments i.e. the return that compensates for pervasive risk factors.

• The results would be relevant to investment analysts who conduct event study analysis. The augmented model can be used as the estimation equation
to compute abnormal returns for the CAR model while conducting an event study analysis to assess stock market efficiency for selected type of information.

- Results on stock market anomalies would provide valuable information to policy makers to make capital market policy for the domestic stock market. Capital market policy should be made keeping in mind the investor behaviour. Their goal is to make markets more efficient. These results shall also be relevant for policy makers in these emerging economies as they make efforts for long term economic cooperation and greater financial integration.

- The study will discern the behaviour pattern of the Indian investor towards information in accruals and cash flows in their contribution to future earnings and the effect of this on stock returns. The study explains relationship between profits and returns from the investor’s perspective. These results will aid in understanding how investor behaviour in India is different from that observed for mature markets and contribute to the behaviour finance literature for Indian market. These results about investor behaviour can be used by the researchers and academicians who can incorporate it at various stages of their research and teaching.

- Academicians can continue to teach the CAPM as an introduction to fundamental concepts of asset pricing literature. However they should expose the students to the significance of multi factor models and its practical implications.

- The results contribute to portfolio analysis, asset pricing anomalies and behavioural finance literature of emerging markets.

1.9 ORGANISATION OF THE STUDY

The study spans eight chapters including the present one. Chapter 2 provides the theoretical framework to asset pricing literature and equity market anomalies covered in the study. Review of literature on asset pricing anomalies covered in the study is
provided in Chapter 3. In this chapter separate discussion of literature on mature and emerging markets has been done. Prominent equity market anomalies are tested for the Indian stock market in Chapter 4 using the CAPM, three factor FF model and augmented FF models. Chapter 5 provides detailed analysis of accruals and cash flows anomalies for India. It is examined if information intermediaries in India anticipate the information in earnings persistence and whether investors price accruals and cash flows relative to their contribution in projection of one year ahead earnings. Then asset pricing tests are conducted to examine the accruals and cash flows anomalies. The profitability anomaly in India stock market is studied in Chapter 6. The study examines the profitability anomaly, investigates the reasons for its existence and explores possible explanations. Chapter 7 examines equity market anomalies for select emerging markets. The last chapter covers summary, concluding remarks and directions for future research.