Chapter 1

Introduction

1.1 General Background

The pricing implication of common stocks has drawn considerable attention since the publication of seminal work of Markowitz (1952) - the mean-variance portfolio theory. Since then there is an ongoing debate on whether the market risk factors explain better or there are some other anomalies influencing of common stock returns. Based on the mean-variance portfolio theory, Sharpe ((1964), Linter (1965) and Black (1972) then proposed extensively argued assts pricing theory-the capital asset pricing model (CAPM). The central prediction of CAPM is that the rate of return associated with common stocks investment is determined by the extent to which the common stock returns are correlated with market portfolio. CAPM asserts that the market risk factors proxied by beta can capture significant variation in common stock returns.

The empirical studies, such as Black, Jensen and Scholes (1972), Miller and Scholes (1972), Blume and Friend (1973), among others, have also documented positive relationship between beta and stock returns. However, there are other empirical evidence (for example, Basu (1977), Banz (1981), Fama and French (1992), among others) which demonstrate the inability of market risk factor (beta) in fully explaining common stock returns as opposed to that suggested by the CAPM. As a result, these studies have evolved the attempts to identify firm characteristics which explain difference in common stock returns. Among several firm characteristics, the most prominent ones are earnings-to-price ratio (Basu (1977)), firm size defines by the market value of equity (Banz (1981)), and book-to-market equity ratio (Stattman (1980); Rosenberg, Reid and Lanstein (1985); Chan, Hamao and Lakonishok (1991)).

The joint role of beta, size, leverage, book-to-market equity and earnings-to-price in the cross-section of average stock returns was evaluated by Fama and

French (1992). The study demonstrated that firm size and book-to-market equity tend to absorb the significant role of leverage and earnings-to-price in average stock returns. Despite of success of the model in empirical studies of matured capital markets, little is known about the results of applying the model to emerging and developing capital markets like Nepal. Hence, there is a need to explore whether CAPM beta alone can predict stock returns, or inclusion of firm size, and book-to-market equity subsume the beta effect on stock returns in the context of stock market in Nepal.

1.2 Statement of Problem

The Capital Asset Pricing Model (CAPM) of Sharpe (1964), Linter (1965), Mossin (1966) and Black (1972) scripts the origin of asset pricing theory. The primary implication of the CAPM is that the model is mean-variance efficiency. This implies that differences in expected returns across stocks and portfolios are entirely explained by differences in market beta. Put differently, there exists a positive linear relation between expected returns and market betas, and variables other than beta should not have power in explaining the cross-sectional variations in common stock returns. The main attraction of the CAPM is that it offers influential and naturally agreeable prediction about how to measure risk and the relation between expected return and risk. However, the empirical documentation of the model is poor enough to nullify the way it is used in application.

The empirical tests of the CAPM are based on three implications of the relation between expected return and market beta implied by the model (Fama and French (1993)). First expected returns on all assets are linearly related to their betas, and no other variable has marginal explanatory power, Second, beta premium is positive, meaning that the expected return on the market portfolio exceeds the expected return on assets, whose return are uncorrelated with the market return. Third, assets uncorrelated the market have expected returns equal to the risk-free rate, and beta premium is the expected return minus the risk-free rate. The early empirical tests in US stock markets focused on the

model's predictions about intercept and slope in the relation between expected return and market beta. Many tests rejected the basic assumption of CAPM. For example, Friend and Blume (1970), Black, Jenson and Scholes (1972) and Stambaugh (1982) documented positive relation between beta and average stock returns, but it was too flat. The CAPM also predicts that the intercept term is equal to risk-free rate. On the contrary, the studies such as by Miller and Scholes (1972), Blume and Friend (1973), Fama and MacBeth (1973), among others, found intercept term greater than the average risk-free rate, and the coefficient on that beta less than the average excess market returns. However, there are few tests on empirical validity of CAPM in the context of stock markets in Nepal and studies find no unanimous conclusion about this. Hence, the present study attempts to test, using more recent data, whether the central prediction of CAPM holds true in Nepalese stock market.

Contrary to the predictions of the CAPM model, empirical studies have found that variables relating to firm characteristics have significant explanatory power for average stock returns, while beta has little power. The most prominent variables associated with firm characteristics are firm size, book-to-market equity, cash flow yield and earnings-to-price ratio. Among the several contradictions, earlier one was Basu's (1977) evidence that when common stocks were sorted on earning -to-price ratios, future returns on high earning-to-price stocks were observed higher than that predicted by the CAPM. Similarly, Reinganum (1981) reported excess retruns on common stocks as a monotone increasing function of earnings-to-price defined as the ratio earnings per share to market price per share. On the contrary, Chan, Hamao and Lakonishok (1991) observed earnings-to-price ratio to loose its significance in predicting stock returns. Similarly La Porta (1996) demonstrated low earning growth stocks. The study concluded that not only did low earnings growth stocks yield higher average returns than high earnings growth stocks in bear market. However, the studies have failed to give unanimous conclusion regarding earnings-to-price effect on stock returns. On the other hand, in relation to firm size effect, Banz (1981) Reinhanum (1981), Keim (1983) observed that small

firms have higher returns and larger firms have lower returns than those predicted by the CAPM. Jagadeesh (1992) also documented no explanatory power of beta in predicting cross-sectional differences in average returns because when the test portfolios were constructed the correlations between beta and firm size were found small.

Finally, Stattman (1980), and Rosenberg, Reid, and Lanstein (1985) demonstrated high average returns for stocks with high book-to-market equity ratios that were not captured by their betas. In later period, Chan, Hamao and Lakonishok (1991) revealed that the ratio of cash flow to price, in addition to book-to-market equity, could explain stock returns in Japan. There is a theme in the contradictions of the CAPM summarized in these studies. Rations involving stock price have information about expected returns missed by market betas. However, most empirical tests that have found those contradictions to the CAPM, involve and error-in-variables problem, since true betas are unobservable and, thus estimated batas are used as proxy for the unobservable betas, Handa, Kothari and Wasley (1989) and Kim (1995) showed that the errors-in-variables problem could induce an underestimation of price of beta risk and an over estimation of other cross-sectional regression coefficients associated with firm characteristics variables such as firm size, book-to-market equity, cash flow to price and earning-to-price that might be observed with error. As a matter of fact, a greater correlation between the estimated betas and firm specific variables causes more downward bias in the price of beta risk estimate and more exaggeration to the explanatory power of the firm specific variables. Hence, this study also attempts to identify whether higher correlation exists between betas and firm specific variables and examine the joint role of beta, firm size and book-to-market equity in explaining common stock returns in the context of Nepal.

The study basically deals with following issues:

a. What is the relationship between stock returns and firm specific variables such as stock beta, firm size and book-to-market equity ratio?

b. Does CAPM explain stock returns in Nepal?

c. Whether CAPM beta alone can predict the stock returns, or inclusions of firm size and book-to-market equity subsume the beta effect on stock returns?

d. Is there any consistency in explanatory power of firm size, book-to-market equity, and stock beta when considered individually and when considered together?

1.3 Objectives of the Study

The main objective of this study is to analyze the cross-sectional variation in stock returns in Nepal with respect to firm specific factors. However, the specific objectives of the study are as follows:

a. To identify the relationship between stock returns and firm specific variables.

b. To evaluate CAPM in explaining stock returns in Nepal.

c. To examine whether CAPM beta alone can predict the stock returns, or inclusion of firm size and book-to-market the equity subsume the beta effect on stock returns.

d. To examine the explanatory power of firm size, book-to-market equity, and stock beta when considered individually and when considered together.

1.4 Organization of the Study

This study is organized into a total of five chapters. Chapter one contains general background of the study including statement of the problem, objectives of the study, and organization of the study. The chapter two consists of conceptual review, review of literatures related to the studies in global context as well as the review of studies in Nepalese context. Besides, this chapter ends up with concluding remarks associated with the findings and major idea of the studies. The chapter three covers the research design, nature and sources of

data, selection of enterprises, models used for data analysis and conclusion along with the limitations of the study. The chapter four focuses on the systematic presentation and analysis of data. This chapter is further divided into three sections, namely, analysis of secondary data, analysis of primary data and concluding remarks associated with the major findings of the study. This chapter five provides a summary of overview on all works carried out in chapter one through four including major conclusions derived from the study. This chapter also includes a separate section for recommendations and the scope for future research based on major findings of the study.

Chapter 2

Review of Literature

2.1 Conceptual Framework

Asset pricing theory is concerned with determining how investors choose to allocate scarce resources among asset. As the underlying theory suggests, the investor allocate resources into asset based on the 'object' and 'theory' of choice. They indicate the risk-return combination of an investment. On the other hand, theory of choices guides on selecting utility maximizing risk-return combination of an investment that is the most preferable one for the investors. The basic foundation for asset pricing theory was laid down by Markowitz (1952) through a seminal work entitled 'Portfolio Selection'. This work, then, popularly recognized as 'Morkowitz Diversification'.

Markowitz portfolio theory asserts that the riskiness of a single asset is entirely different from that of a portfolio of assets. According to this theory, a single asset may be made risky when held in isolation, but not much risky when held in combination with other assets in portfolio. This conclusion is based on the idea that the riskiness of a portfolio is not only determined by variance of asset return, but also by covariance or correlation of returns between assets held in the portfolio. Markowitz drew attention to the common practice of portfolio diversification and showed exactly how an investor can reduce the standard deviation of portfolio returns by choosing stocks that do not move exactly together. Hence, Markowitz Diversification suggests that investors become able to diversify much of their investment risk by holding portfolio of the assets that are less than perfectly positively correlated.

Markowitz (1952) portfolio theory provides basic foundation for assets pricing theory. The underlying construct of the portfolio theory motivated Sharpe (1964), Linter (1965), Mossin (1966) and Black (1972) to extend and develop the assets pricing theory - the capital assets pricing model (CAPM). The CAPM states that the expected risk premium on each investment is

proportional to its beta. It implies that each investment should lie on the sloping security market line connecting treasury bills (proxy for risk free rate) and the market portfolio (that is, market return). The CAPM suggests the concept of market equilibrium to determine the market price and appropriate measure of risk for a single asset. It shows that the equilibrium rates of return of risky assets are the functions of their covariance with the market portfolio. The underlying assumption of CAPM is that all investors are price takers and have homogeneous expectation about asset returns that have a joint normal distribution. In Theory, when all individuals have homogeneous expectations, the market portfolio is not necessarily efficient and the equilibrium model of capital market does not necessarily hold. Thus, the efficiency of the market portfolio and the capital asset pricing model are inseparable, joint hypothesis. It is not possible to test the validity of one without other.

Given the market efficiency, CAPM postulates that only a component of total risk, which is related to the market, is relevant for pricing of capital assets. The CAPM establishes a link between market risk (measured by beta) and return for all assets. Therefore, the relationship between expected return and market risk is the essence of the CAPM. It takes into account the market related risk of an asset and compares with the market risk of a well-diversified portfolio. Thus equilibrium rate of rate of return for individual assets is given by the CAPM. This model is able to depict actual market behavior concerned with expected return and market related risk of portfolio. The CAPM argues that market portfolio is a well diversified portfolio; the assets must be priced to compensate for systematic risk. The unsystematic risk is uncorrelated with the market, and therefore, is omitted. Hence, the theoretical foundation of CAPM reveals that stock beta, a measure of systematic risk, can capture much of variations in common stock returns.

The CAPM has not gone unchallenged. The validity of the CAPM is questioned because it posits linear relation between expected returns and beta, while other firm specific variables such as firm size, book-to-market cross-

sectional returns. The key ingredient in the model is the use of beta as a measure of risk. Although, early studies, for example, Friend and Blume (1970), demonstrated beta to have reasonable predictive power about returns on a portfolio of common stocks, other empirical evidences, for example, Basu (1977), Banz (1981), Stambaugh (1994), Chan, Hamao and Lakonishok (1991), Fama and French (1992), Davis (1994), and Kothari, Shanken and Sloan (1995), among others, have raised doubt against validity and applicability of this model. Many of these studies have one concluded that the factors other than beta are successful in explaining that portion of common stock returns not captured by beta.

Several anomalies, other than CAPM beta, have become evident when studies have attempted to explain actual stock returns. For example, size effect of Banz (1981) is one of them, which have demonstrated that common stocks of firms with small market capitalization provide higher returns than common stocks of firms with high capitalization, holding other things constant. Another irregularity is that common stocks with high earnings-to-price and book-to-market equity ratio do better them common stock with low ratios. For example, Basu (1977) has observed that low price-to-earnings portfolios have rates of return higher than that could be explained by the CAPM; Chan, Hamao and Lakoniskok (1991) have documented that book-to-market equity and cash flow yields are important in explaining common stock returns. On the other part of studies, although empirical testing of CAPM by Black, Jenson and Scholes (1972) has reported a linear empirical market line with positive risk return trade-off, the intercept term has been found significantly different from zero that rejects empirical validity of the CAPM. The study has concluded that the price-earnings ratio explains significant portion of common stock returns not captured by the CAPM and also has suggested that the CAPM is either miss-specified and requires the addition of factors other than beta to explain stock returns or that the problem in measuring beta are systematically a related to variables such as firm size.

2.2 Review of Related Studies

This section provides a review of major empirical studies associated with firm specific and macroeconomic influences on cross section of common stock returns. The review of empirical works along with major conclusions are presented in four subsections, which consist of review of studies associated with empirical test of the CAPM, review of empirical evidences inconsistent with the CAPM, review of studies associated with macroeconomic influences on common stock returns and reviews of related Nepalese studies.

The central prediction of the CAPM became doubtful in the late 1970s period when studies documented some ad hoc alternatives explaining the cross section of common stock returns. The earlier evidences inconsistent to the CAPM were documented by Basu (1977) and Banz (1981), who found that earnings-to-price and market capitalization of equity, respectively, could predict significant variation in common stock returns than that of by CAPM beta. In later period, Fama and French (1992) articulated that book-to-market equity ratio have significant explanatory power in predicting common stock returns. The empirical evidences inconsistent to CAPM are discussed in the following subsections dividing into size effect, earning-to-price effect, book-to-market effect and mixed effect.

Banz (1981) examined the relationship between other market value of equity and common stock returns. The study included of all common stocks quoted on the NYSE for at least five years between 1926 and 1975. Data were derived from monthly returns file of the Center for Research in Security Price (CRSP) of the University of Chicago. Using pooled cross-sectional and time series regression of the form given in Equation 2.1, the study reported that small NYSE firms, on average, have significantly larger risk adjusted returns than large NYSE firms. The evidence suggested that the CAPM was misspecified. In other words, the study found negative statistical association between returns and beta documented in the earlier studies of the CAPM. However, the study also reported that the size effect was not linear in the market proportion but was

also most pronounced for the smallest firm in the sample. The effect was also not very stable through time. An analysis of the ten year sub-periods showed substantial differences in the magnitude of the coefficient of the size factor. Finally, the study concluded no theoretical foundation for such an effect, and it was even not confirmed whether the factor was size itself or whether size was just a proxy for one or more true but unknown factors correlated with size. Therefore, it suggested to offer conjectures and ever to discuss some factors of which size was suspected to proxy.

Additional evidence in Reinganum (1990) suggested that the relative price behavior of small and large firms might differ for over-the counter (OTC) stock. Using data for the 1973-1988 period, the study reported significantly lower returns for small OTC stocks then NYSE and AMEX firms with the same size and it also found the small-firm premium for OTC stocks much lower than the NYSE and AMEX stocks. This study further noted such differences to exist because of the differences in liquidity and differential costs of trading small stocks in these two types of markets. Hence, the basic implication of this study is that market structure may be an important influence on the measured size effect.

Following the discovery of a size premium in the US equity markets, numerous studies have demonstrated its existence in the most markets around the world. Models similar to (2.3) had been estimated for France (Hawawini and Viallet (1987)), United Kingdom (Corhay, Hawawini and Michel (1988)), Belgium (Hawawini, Michel and Corhay (1989)), Canada (Calvet and Lefoll (1989)) and Japan (Chan, Hamao and Lakonishok (1991)). In case of all these countries, no relationships were observed, on average, and between return and beta risk when all months of the year were considered. There was, however, a significant negative relationship between returns and portfolio size in all countries except Canada and France. The size premium was found to be positive in all countries during the reported sample periods. As was the case

for US data, differences in beta across size portfolios could not explain differences in returns.

Kenz and Ready (1997) analayzed the risk premia on size and book-to -market that included a robust regression estimator. By comparing the results from the standard least square regressions to the results from least trimmed square regressions with various trimming proportions, the authors showed that negative relation between firm size and average returns was driven by a few extreme positive returns in each month. In fact, when only one precent of each month's observations were trimmed, there was a significant positive relation between firm size and average returns. Thus, this result contradicts with usual negative relation between firm size and stock returns.

There are some studies which also advocate in favor of the CAPM beta effect as compared to ad hoc size effects. For example, in an attempt to examine the scenario where the CAPM is true and where it is false, Grauer (1999) investigated whether the coefficients from regression of population expected excess returns on distinguish between scenarios. The data set explored in the studies consisted of 10 size portfolios complied from all NYSE and AMEX stocks contained in the CRSP database with returns from the period of 1926 to 1989. The author used ordinary least square (OLS) and generalized least square (GLS) regressions and reported true coefficients of OLS and GLS as predicted in the case where CAPM was true. The results also indicated negative size coefficients in an OLS and GLS regression of expected excess returns on equal weighted portfolio betas and size. However, author postulated that the size effect was simply an artifact caused by using equal-weighted proxy portfolio betas instead of market portfolio betas.

In recent period, Gomes, Kogen and Zhang (2003) examined a link between expected stock returns and firm characteristics suc has firm size and the book-to-market ratio. Using Fama and MacBeth (1973) regressions of stock returns in size and book-to-market equity and conditional market betas, the logarithm of market value (firm size) appeared to contain useful information about the

cross-section of common stock returns. The relation between returns and size was found significantly negative. The study also confirmed the importance of the book-to-market ratio in addition to the size explaining the cross-sectional properties of stock returns.

The ratio of book-to-market equity deserves mention because of its significant predictive power to predict cross sectional differences in stock returns both in the United States and other countries. As in the case for the other variables discussed, there is no theoretical model which predicts that book-to-market should be able to explain the cross sectional behavior of stock returns. However, investment analyst (for example, Graham and Dodd (1940)) have long argued that the magnitude of the deviation of current market price from book value per share is an important indicator of expected returns. A succession of studies (for example, Stattman (1980), Heim (1983), Rosenberg, Reid and Lanstein (1985), DeBondt and Thaler (1987), and Fama and French (1992), among others) have documented a significant positive relation between book-to-market equity and stock returns. This section provides a review on some of the empirical studies in this regard. Table 2.3 provides a list of empirical evidence on book-to-market effect made their major findings.

Chan, Hamao and Lakonishok (1991) attempted to study cross sectional differences in stock returns in the context of stock market in Japan using four variables, namely, earnings-to-price, cash flow yield, size and book-to-market equity. The study used monthly data on stocks listed in the Tokyo stock exchange (TSE) from January 1971 to December 1988.

The joint roles of market beta, size, earnings, yield, leverage and book-to-market equity in the cross section of average returns was evaluated by Fama and French (1992) using all non-financial firms in the intersection of the NYSE, AMEX and NASDAQ returns file from the CRSP and the merged COMPUSTAT annual industrial files of income statement and balance sheet data covering the period from July 1963 to December 1990. The study

revealed strong relationship between the average returns on stocks and size, but there was no reliable relation between average returns and beta. When stock returns were sorted based on earnings-to-price, a familiar U-shape relation was observed. The relation between average return and book-to-market equity was strongly positive. The regressions results also confirmed the importance of Book-to-Market equity in explaining the cross section of average stock returns. This Book-to-Market equity relation was found stronger than the size effect. When both size and book-to-market equity were included in the regressions, the average size slope was still negative 1.99 standard errors from zero; the Book-to-Market slope was an impressive 4.44 standard errors from zero. The reported Book-to-Market as consistently the most powerful factor explaining the cross section of the average stock returns for the two sub-periods considered, whereas size effect was found weaker in later sub-period from 1977 to 1990.

Lakonishok, Shleifer and Vishney (1994) examined whether glamour stocks have negative returns around subsequent earnings announcements, and value stocks have positive returns. This was consistent with the market having the wrong expectation initially. Value strategies call for buying stocks that have low prices relative to some measure of value (i.e. earnings, dividends, historical prices, or book assets). Value strategies seem to produce excess returns-but this is because they are contrarian (to native strategies such as extrapolating past earnings growth, or over-reacting to news so that glamour stocks are overpriced), or they are fundamentally riskier. The sample period covered in the study was from the end of April 1963 to the end of the end of April 1990. Using returns data from CRSP and Accounting Data from COMPUSTAT for universe of stocks in NYSE and AMEX, the authors found that glamour stocks did underperform relative to value stocks over 1968-90 period apparently because market consistently over estimated future growth rates of glamour stocks relative to value stocks. Also value stocks were no more risky then glamour stocks.

A different view on cross-section variations in common stock returns was presented by Kothari, Shanken and Sloan (1995). The study examined whether beta could explain cross-sectional variations in average returns over the post-1940 periods as well as longer post-1926 period, and whether Book-to-Market equity could capture cross-sectional variations in average returns over a longer 1947 to 1987 period. The study noted that the relationship between Book-to-Market equity and returns was weaker and less consistent than that in Fama and French (1992). It claimed that past Book-to-Market results using COMPUSTAT data were affected by a selection bias and thus provided indirect evidence. Using an alternative data source from standard and poor's industry level from 1947 to 1987, the study further noted that Book-to-Market was at best weakly related to average stock returns. The study presented evidence that average returns could indeed reflect substantial compensation for beta risk, provided that betas were measured at the annual interval. Thus, the failure of a significant relation between Book-to-Market equity and returns to emerge from the standard and poor's industry portfolios posed a serious challenge to Book-to-Market equity "Empirical Asset Pricing Model".

In a very recent year, Fama and French (2008) assessed the effect of Book-to-Market equity in different approach and studied that whether the past changes in Book-to-Market and price did contain independent information about the expected cash flows that could enhance the estimates of expected return. The study used data from 1926 to 2006 for both ABM stocks (All but Micro Stocks of all 20th percentile of market cap) and Microcap stocks (below the 20th percentile of NYSE market cap) from NYSE, AMEX and NASDAQ. The study also examined the effect in terms of sheer issue, changes in price and book equity per share and new issue of shares. The study reported significant positive coefficient of Book-to-Market equity for both ABM and Microcap stocks implying that higher Book-to-Market stocks that could have higher returns than lower Book-to-Market stocks. The study simply reconfirmed the significance of Book-to-Market effect in explaining the stock returns.

Size, earning-to-price and book-to market equity are computed using a common variable market equity or market price per share. Most studies use market value of equity as firm size, whereas it is also used as a common denominator in calculating earnings-to-price, and book-to-market equity ratios. Therefore, studies have also explored some mixed evidences on joint effect of these variables on common stock returns. The empirical evidences on mixed effects of firm specific variables on stock returns are listed in Table 2.4 along with major findings.

In an attempt to examine the cross-section of common stock returns, Davis (1994) used data from July 1940 to June 1963 with respect to beta, Book-to-Market equity, earnings-to-price, among others during Pre-COMPUSTAT era. The data for the study were taken from two sources. Book values, earnings, cash flows and sales figures were from the Moody's Industrial Manuals that were published from 1940 to 1962. Stock returns, stock prices and market values of equity were from the University of Chicago CRSP monthly file of NYSE and AMEX firms after June 1962. Using these data sets, the study found significant relationship between certain variables such as Book-to market equity, cash flow yield and earning-to-price, and subsequent returns during the period from July 1940 to June 1963. The result reported significant explanatory power of natural log of Book-to market equity with respect to subsequent stock returns in cross-sectional regression analysis as well. The study also demonstrated a January seasonal in the explanatory power of several of the independent variables; much of the book-to-market equity, and earning-to-price effects were in January.

Fama and French(1995) analyzed whether the behavior of stock prices, in relation to size and book-to-market equity, reflect the behavior of earnings. The study focused on six portfolios formed yearly from a simple sort into three groups on Book-to-Market equity. Using NYSE, AMEX and NASDAQ stocks data from 1963 to 1992, the study attempted to provide an economic foundation for empirical relations between average stock returns and size, and

average stock returns and Book-to-Market equity observed in Fama and French (1992). The evidence presented in this study showed that size and Book-to market equity were related to profitability. The result confirmed that firms with high Book-to market equity tended to be persistently distressed and conversely, low book-to-market equity stocks were found to be associated with sustained a strong profitability. The study also revealed small stocks to be less profitable than big stocks made in Book-to-Market equity groups. The study articulated that the size and Book-to-Market risk factor in stock returns should have traced to common factors in shocks to expected earnings that were related to size and Book-to market equity.

In an attempt to reexamine the relationship between firm size, and Book-to market ratio and security returns. Barber and Lyon (1997) used holdout sample of financial firms along with non-financial firms from July 1973 through December 1994. The analysis revealed similar relation between size, Book-to-Market, and security returns for financial and non-financial firms. The evidence documented the robustness of the Book-to market and return relation. Further, the study showed that survivorship bias in COMPUSTAT data would not significantly affect the estimate of the size or Book-to market premium for either financial or non-financial firms, as suggested by Kothari, Shanken and Sloan (1995). The results indicated that firm size and Book-to market ratios would explain in on economically meaningful way cross-sectional variation in security returns.

The joint evaluation of explanatory power of beta, firm size, Book-to-Market equity, and the earning-to-price ratio for average stock returns was made by Kim (1997) correcting two currently controversial biases: selection bias in COMPUSTAT and errors in variable bias. The purpose of the study was to reassess whether firm size, Book-to-Market equity. An earnings-to-price did have significant explanatory power to average stock returns. The study was based on stock returns and firm size data on all NYSE and AMEX firms listed on the CRSP monthly return five for at least two years during the period July

1958 to December 1993 and for at least one month after June 1963. The study found that the selection bias in COMPUSTAT data have no significant impact on the estimation from Book-to-Market equity. As expected, when the error in variable bias was connected, betas were found to have a significant positive relation with average stock returns, regardless of the presence of firm size, Book-to-Market equity and earnings-to-price in the model. Remarkably, the study documented the firm size being marginally significant in explaining average stock returns when monthly returns were used, but insignificant when quarterly returns were used. These results supported market betas more strongly. Earnings-to-price was also found insignificant when betas were included. However, Book-to-Market equity was still found to have significant explanatory power to average stock returns, even though the error in variables bias was corrected.

In an attempt to offer simple model of time varying beats as way of demonstrating the importance of beta are explaining the cross section of realized stock returns, Howton and Peterson (1998) used returns files of all non-financial firms of NYSE, AMEX and NASDAQ obtained from CRSP covering the sample period from July 1977 to June 1994. Using dual beta asset pricing model, with risk changing according to a determination of bull and bear markets, the study attempted to test if beta could explain the cross section of realized stock returns. The study also attempted to determine whether beta alone could provide an explanation of returns and also if the improve measurement of beta could affect the importance of market equity and Book-to-Market equity. When a constant risk beta was the only independent variable, it was not significant. When the additional independent variables-market equity, Book-to-Market equity and earnings-to-price were added to the model, the result indicated significant beta estimated with constant risk model. The Book-to market equity coefficient was significantly positive and coefficient of size was not significant.

The same study revealed that the coefficient of earnings yield dummy being insignificantly negative implying that positive and negative earnings affected returns differently. However, when the bull-market beta was used as the only independent variables, its coefficient was found significantly positive. When the other independent variables were included, the bull-market beta still retained its significance, whereas all other independent variables loosed their significance. The results from regressions with bear-market betas indicated significance negative relation with returns. The authors reasoned that one would expect highly risky firms would do worse than less risky firms in poor market conditions. Thus, one would expect negative relation between risk and return in a bear-market.

In an effort to distinguish the risk model from characteristic model to find independent variation in characteristic and risk loading unrelated to Book-to-Market equity, Davis, Fama and French (2000) covered 68 years of period from July 1929 to June 1997 and included all NYSE industrial firms as sample. The study revealed a robustness of value premium in average stock returns and a smaller 'size effect'. The three factor risk premium model was found to explain value premium better than characteristics model. However, when portfolios were formed from independent sorts of stocks on size and Book-to-Market equity, the three factor model was rejected. The study, thus, concluded that three factor models was just a model and thus an incomplete description of expected returns and the model's shortcomings were just not those prediction by the characteristics model.

Similarly, Daniel, Titman and Wei (2001) evaluated the return pattern in Japanese portfolios with a reference to explanatory power of Fama and French (1993) three factor model verses Daniel and Titman (1997) characterstics model. The study examined monthly data on common stocks listed in Tokyo stock exchange from January 1971 to December 1997 for the purpose of testing portfolios sorted on firm size and Book-to-Market ratio. The results indicated that smaller firms and high Book-to-Market firms could earn many high CAPM

risk-adjusted abnormal returns and suggested that CAPM could not hold true for Japanese data. When portfolios were sorted on the size, Book-to-Market and factor loading, the results demonstrated a positive relation between average mean excess returns and factor loading rankings. However, the study also revealed no significant relation between factor loadings and returns within a size and Book-to-Market equity group.

The significance of explanatory power of size and Book-to-Market equity in explaining cross section of common stock returns was evaluated by Chou and Wang (2004). The study covered the period from July of 1963 through December of 2001. The empirical results showed a significant negative relation between size and stock returns over full sample period, whereas a significant positive relation between Book-to-Market equity ratio and stock returns. The relationship between beta and stock returns was found to be flat. The study revealed the diminishing coefficient of size for out of sample period 1982-2001. The results over sub-period indicated a significant positive relation of Book-to-Market equity for the period 1963-1989 returns, but the relationship was insignificant for the post sample 1990-2001. The authors noted that explanatory power of these two characteristics disappeared after the papers highlighting them were published. However, the results for the month of January indicated that beta significantly could account the cross-sectional variation in stock returns in January. The coefficients of size were significantly native for every period, suggesting the existence of a significant January size effect. The results showed a significant size effect for the non January months, but Book-to-Market equity effect was always significantly positive. Thus, the authors concluded the size effect as being the January effect, and Book-to-Market equity as non January effect.

The effect of company characteristics on common stock returns in Indian context was analyzed by Kumar and Sehgal (2004) using adjusted month end data for share prices of 364 companies from July 1989 to March 1999. The share price data were taken from Capital Market Line Software. The Bombay

stock exchange (BSE) national index was used as a surrogate for aggregate wealth and yields on 91-day Treasury bills were used as a risk free proxy. As for the priori expectation, the study revealed a strong negative relationship between firm size and stock returns. The empirical results, however, provided a mixed picture in relation to value effect. The returns on the portfolio sorted on Book-to-Market equity were almost identical; however, a strong and positive value effect emerged for earnings-to-price sorted portfolio.

Cross section of stock returns on the Shanghai stock exchange (SSE) was investigated by Wong, Tan and Liu (2006). The study explored the cross-sectional stock returns behavior on the share market of the SSE. They estimated the effects of beta, firm size, Book-to-Market equity ratio and a variable unique to the Chinese stock markets. The proportion of firm's floating equity over total equity of SSE for the period 1993-2002. The study revealed the negative relation of stock returns with beta and firm size and positive relation with Book-to-Market equity ratio. The results indicated that returns are higher for small, value stock with low systematic risk. Size was found to be positively related with beta but negatively related with stock returns, and Book-to-Market equity ratio. The study suggested that larger firms have higher systematic risk and lower returns, and value stocks have higher returns, lower systematic risk and are smaller in size.

Guan, Hansen, Leikam and Shaw (2007) examined the validity of CAPM and analyzed whether idiosyncratic variables such as firm size, Book-to-Market and price-to-earnings ratio could explain average cross-sectional variation in stock returns. The study employed more rigorous statistical methods to control for beta shifts. The analysis was done using all firms from the NYSE, AMEX, NASDAQ return files from CRSP. The ability to explain cross-sectional returns was estimated for eight different estimates of beta. The result showed idiosyncratic variables to be related with expected returns, even if the CAPM generated the expected return. The study documented the evidence supportive to validity of the CAPM. The presence of size, Book-to-Market and price-to-

earnings effects for average cross-sectional returns were found not inconsistent with a valid CAPM. The study also revealed a negative relation of expected returns with size and positive relation with Book-to-Market and earning-to-price variables, given the expected returns generated by the CAPM. The results further suggested a decrease in significance of idiosyncratic variables when measurement errors in beta could be reduced.

In an attempt to evaluate the joint role of market beta, size, earnings-to-price and Book-to-Market equity in the cross section of average returns on the stocks of Athens stock exchange (ASE), Michailidis, Tsopoglow and Papanastasiou (2007) covered a period from January 1997 to December 2003. The study indicated no relation between size and average returns and beta when portfolios were formed on size alone. It revealed contradictory results in every year of the study where low beta portfolio provided higher returns than high beta portfolios. The sample size sorted portfolio, thus did not seem to support Sharpe, Linter, Black (SLB) prediction of positive relation between beta and average return. The study observed no relation between earnings-to-price and average returns and between average returns and Book-to-Market equity.

The same study also attempted to evaluate joint roles of market beta, size, earnings-to-price and Book-to-Market equity and found no supportive evidence of these variables in explaining stock returns. When portfolios were formed on size, the combination of these variables indicated no power of interpreting average returns. However, the intersection of the variables with beta sorting criterion for creating portfolio supported the idea that when beta, size and Book-to-Market equity were combined together, the model could explain the variation in average returns. The more reliable results were provided when portfolios were created on the bases of Book-to-Market equity. The study concluded that relations between returns and economic variables that measure variation in business condition were affected from the general economic situation and might help expose the nature of the economic risk captured by

firm's fundamental variables like size, Book-to-Market equity and earning-to-price.

Nartea, Ward and Djajadikerta (2009) attempted to confirm the size, Book-to-Market and momentum effects in New Zealand stock market using the data from 1995 to 2004. The selected stocks were ranked by size and sorted into two groups-small and big-with an equal number of stocks in each group. The stocks were also independently ranked by the Book-to-Market ratio and then sorted into three groups of equal size- low, medium and high Book-to-Market groups. The study demonstrated the Book-to-Market effect with low returns increasing from low to high Book-to-Market portfolios for both small and big stocks. It reported a return premium of 26.42 percent per annum for small firms with high Book-to-Market relative to small firms with low Book-to-Market, and a premium of 10.68 percent per annum for big firms with Book-to-Market compared with big firms with low Book-to-Market. The size effect, however, was not as strong. Small firms and outperformed large firms only in the high Book-to-Market category, with the return premium 15.46 percent per annum. There appeared a reversal of the size effect for low and medium Book-to-Market categories but the return differences were not statistically significant. The authors postulated that this could be due to stocks in the New Zealand market being relatively small by international standards and compounded by the fact that top 15 companies account for nearly half of the total market capitalization of domestic markets.

On the contrary to the number of studies associated with the cross-sectional and macroeconomic volatility of stock returns in context of US and other developed capital markets, there are few empirical works in the context of Nepal. This sub-section provides review of empirical works associated with cross-sectional variation in common stock return in context of Nepalese stock market.

In an attempt to address the stock market behavior in a small capital market in the context of Nepal, Pradhan (1993) examined relationship of market equity,

market value to book value, price-earnings ratio, and dividends with liquidity, leverage, profitability, assets turnover and interest coverage ratio. The study was based on the dat derived from 17 companies listed in Nepal Stock Exchange (NEPSE) for the period of 1986 to 1990. The study, among others, used simple linear regression to test whether profitability are significantly related to market equity. The study documented that larger stocks have lower profitability, meaning that returns are negatively related to the market value of equity. However, the study also noted that returns on larger stocks are less variable than that on smaller stocks.

Pradhan and Balampaki (2004) examined the fundamental factors affecting stock returns in the context of Nepal using pooled cross-sectional data of 40 enterprises listed in NEPSE covering a period of 5 years from 1995/96 to 1999/00. The study revealed significant positive effect of earning-to-price and cash flow yield on dividend yield. Similarly, capital gain yield was found to be positively influenced by earning to price and size, whereas, the same was negatively influenced by book-to-market equity. Beside, total yield was positively determined by earning-to-price and size and negatively determined by book-to-market equity. The authors found book-to-market equity to be more informative than other variables.

Baskota (2007) analyzed the effect of trading days, trading volumes, base money supply, interest rates, inflation and industrial production on the stock returns using the data from NEPSE for the period 1994 to 2006. The study concluded that there is no persistence of volatility in Nepalese stock market and the stock price movements are not explained by the macroeconomics variables. In an event analysis conducted in the study, it was concluded that political events are not only the factors that explain stock price movements in Nepalese stock market.

The cross sectional variation in common stock returns in Nepal with respect to market risk premium, size, book-to-market equity, cash flow yield and earnings

yield was examined by K.C. (2009). The study was based on the data from 48 companies' listed in NEPSE with a total of 291 observations from the period 1998/99 to 2006/07. The study revealed that the joint roles of size, book-to-market equity, cash flow yield and earnings yield in explaining stock returns in general do not give strong supportive evidence. When portfolios were formed on size, the results indicated that large stocks achieve higher returns, higher excess returns, and larger market risk premium. However, the size, on a multiple log-linear model exhibited significant positive relations with stock returns and excess returns reliable across all the models of simple and multiple regressions and analysis of portfolios sorted by book-to-market equity. The author postulated that book-to-market equity is the most significant positive determinants of stock returns in Nepalese stock market.

To sum up, the studies on firm specific variables have not documented consistent results. Some of these studies found that market risk factor as noted by CAPM explains the significant variation in common stock returns, while others found that fundamental characteristics associated with firms are significant in explaining the common stock returns. Hence, these study attempts to reexamine the association among these variables in predicting stock returns in the context of Nepal.

Chapter 3

Research Methodology

3.1 Research Design

This study has employed descriptive, correlational and casual comparative research designs to deal with the fundamental issues associated with factors influencing common stock returns in the context of stock market in Nepal. The descriptive research design has been adopted for fact finding and searching adequate information about factors affecting common stock returns. This design has also been employed to access the opinions, perceptions and characteristics of respondents such as investors, executives and securities business persons with respect to market preferences, market efficiency including factor affecting common stock returns in Nepal. Beside, an effort has also been made to describe the nature of cross sectional common stock returns of sample enterprises by using descriptive statistics with respect to firm specific variables such as firm size, and book-to-market equity, along with stock beta. This study is also based on correlational research design. This design has been adopted to ascertain and understand the directions, magnitudes and forms of observed relationship between common stock returns and firm specific variables. Moreover, this study has also employed casual comparative research design determine the effect size of stock beta, firm size, and book-to-market equity on cross sectional common stock returns.

3.2 Nature and Sources of Data

This study is based on secondary sources of data. These secondary sources of data have been employed to understand the form of observed relation and to analyze predictive power of firm specific in explaining common stock returns.

The data for firm specific variables including stock market data have been obtained from financial statements of the sample firms recorded in the database of Nepal Stock Exchange (NEPSE) Limited and Securities Board of Nepal

(SEBON) provided in their respective web sites. NEPSE and SEBON have maintain the Paccar record of firm specific financial data only from the fiscal year 2002/03 two 2010/11 in their respective database in web sites. Therefore, the firm specific data prior to 2002/03 had been derived from various issues of 'Financial Statements of Listed Companies' published by Nepal Stock Exchange Limited. Similarly, firm specific data of more recent period (that is for the year 2010/11) are unavailable for most of the listed firms as these firms have not timely submitted their annual reports. Overall, the period covered in study with respect to firm specific variables ranges from fiscal year 2000/01 to 2010/11. The number of observations varies among enterprises with minimum 2 to maximum 11 observations. Such variations in number of observations have been noticed many due to the unavailability of continuous year's data for several firms.

3.3 Population and Sample

Population of this study includes all listed firms in Nepal Stock Exchange (NEPSE) Limited to the end of mid-April 2011. A total of 181 enterprises were listed in NEPSE as of mid-April 2011 and 30 of them were included in the sample list. In selecting the most reliable and representative samples, first the population of the NEPSE was stratified into different sectors as defined by NEPSE and then enterprises from each stratum were selected on the basis of availability of market and firm specific financial information of at least two continuous years from the fiscal year 2000/01 to 2010/11.

The Nepalese stock market is dominated by deep and broad market of banks and finance companies and the updated financial statements of many of these sectors' firms are available in the NEPSE and SEBON database. However, financial information relating to manufacturing and processing, trading, hotels, and other sectors' enterprises are relatively of older date and the number of firm years are relatively fewer. Therefore sample list is basically dominated by banks and finance sectors' enterprises both in terms of number of firms and number of observations.

Table 3.1

Population and sample enterprises from different sectors

S.No.	Sector	Population (N)	Sample n	Number of Observations
1.	Banks and Finance Companies	130	20	146
2.	Insurance Companies	19	4	37
3.	Manufacturing and Processing	18	2	9
4.	Trading	4	1	4
5.	Hydropower	4	1	5
6.	Hotels	4	1	4
7.	Others	2	1	5
	Total	**181**	**30**	**210**

Sources: www.nepalstock.com

Table 3.1 shows the population and sample of the study along with their respective number of observations that represents different sectors as defined by NEPSE. The overall sample enterprises represent 16.67 percent of the population in NEPSE and total number of observations include 210 firm-years with the highest 146 observations from banks and finance companies.

3.4 Method of Data Analysis

The main purpose of data analysis in this study is to explore the predictive power of firm specific variables in explaining common stock returns for selected enterprises in the context of stock market in Nepal. This section deals with statistical and econometric models used for the purpose of analysis of both primary and secondary data.

The methods of data analysis used in this study are divided into three subsections. First section deals with the methods of secondary data analysis. This includes descriptive statistics, correlation analysis, and analysis by forming portfolios and regression analysis. Second section describes different statistical tests of significance for validation of model such as t-test, F-test, detection of auto correlation and multi co-linearity. Third section presents the

methods used for primary data analysis. This in includes percentage frequency distribution, cross-tabulation, mean scores of responses to Likert scale items and ranking items along with statistical test of significance such as t-test, F-test and chi-square test.

The method of secondary data analysis used in this study consists of econometric models including several statistical test of significance. Econometric models consist of cross sectional regression models and auto regressive models. The study has also used descriptive statistics, correlation analysis along with statistical test of significance such as *t*-test, *F*-test, Adjusted R^2, test of autocorrelation and multi co-linearity. Details of models and statistical test of significance have been dealt in the following sections.

The Model

In order to explain the effect size of firm specific explanatory variables such as stock beta, firm size, and book-to-market equity on cross-section of common stock returns, the empirical regression model (Davis (1994)) of the form specified in equation (3.1) has been used.

$$R_{it} = \propto + b_{1t}\beta_{it} + b_{2t}LME_{it} + b_{3t}BE/ME_{it} + e_{it} \quad \ldots(3.1)$$

In equation (3.1) R_{it} refers to the returns of common stock of firm '*i*' for period '*t*', β_{it} is the stock beta of firms '*i*' for period '*t*', LME_{it} is the natural logarithm of market value of equity, BE/ME_{it} denotes the ration of book-to-market equity, and 'e_{it}' refers to the unexplained residual error terms, $\propto$ is the intercept term, and b_{1t}, b_{2t}, and b_{3t} are the respective parameters of explained variables to be estimated.

The cross-sectional variations in stock returns associated with stock beta, firm size, book-to-market equity ratio, and earnings-to-price ratio have been examined by using a total of ten specifications of equation (3.1). First four specifications and include simple linear regression of stock returns on stock beta, firm size, book-to-market equity and earning-to-price individually. Multiple regressions of specifications five, six and seven have been used to

evaluate the joint role of stock beta and firm size, stock beta and book-to-market equity and firm size and book-to-market equity respectively. The inclusion of stock beta may provide an interesting insight into the relational between firm size and book to market equity ratio and common stock returns (Fama and French, 1992). It has been examined by including stock beta, firm size and book-to-market equity as explanatory variables in a multiple regression of specification eight. In the next two specifications, the joint roles of firm specific variables together with stock beta have been examined by including the estimated value of stock beta, fir ifm size, book-to-market equity and earning-to-price.

The equation (3.2) specified above assumes the following reasonable a priori hypothesis:

$$\frac{\delta R_{it}}{\delta \beta_{it}} > 0; \frac{\delta R_{it}}{\delta LME_{it}} < 0; \text{ and } \frac{\delta R_{it}}{\delta BE/ME_{it}} > 0 \quad \text{.....(3.2)}$$

The priori sign expectation in equation (3.2) implies that the stock returns are positively related with stock beta, and book-to-market equity and negatively related with firm size.

Descriptive Statistics

This study has used the summary of descriptive statistic associated with dependent and independent variables of sample firms to explain the cross-sectional characteristics of these variables during the sample period. The descriptive statistic such as mean, median, standard deviation, minimum and maximum values of the variables-market value of equity, book value of equity, earnings to share, market price per share, book-to-market equity ratio, , and stock beta, including excess stock returns and excess market returns have been used to describe the characteristics of sample firms during the period.

Correlation Analysis

This study is also based on co relational research design. This design has been basically adopted to identify the direction and magnitude of relationship between different pairs of variables. For this purpose, correlation analysis has been used. It is a statistical tool to identify direction and magnitude of relation between two set of variables. It shows how two variables moved together and also shows the degree of association between them. The relationship has been explained by using bivariate Pearson correlation coefficient. The value of correlation coefficient ranges from -1 to +1. If correlation coefficient is exactly -1, two variables are said to have perfect negative correlation as such that they move together exactly into opposite direction. On the other hand, if correlation coefficient is +1, the variables are said to be perfectly positively related. First, the study has attempted to identify and explain the relationship between stock returns and several firm specific variables. Second, it has analyzed the relationship between stock market returns and different set of macroeconomic variables. Beside, the study also has employed statistical test of significant relationship between different pairs of variables using *t*-statistics.

Analysis if portfolios formed on one-way sorts

Secondary data analyses are also based on the analyses of univariate and bivariate sort of portfolios formed on stock beta, firm size, book-to-market equity and earning-to-price ratios. For the purpose of univariate sort of portfolios, total 210 observations of all sample firms over the period from 2000/01 through 2010/11 have been grouped into 5 equal percentile groups of portfolios. The cut-off points to form the five portfolios have been set at 20^{th}, 40^{th} 60^{th} and 80^{th} percentiles. A total of 4 univariate sorts of the portfolios have been used to study the pattern of movement in cross-section of common stock returns the respect to firm specific variables. The first five portfolios have been formed on the basis of univariate sort on stock beta, second on firm size, third on book-to-market equity, and fourth on earnings-to-price ratio. At each sort, the properties of stock returns movement has been observed and analyzed with

respect to the movement in firm specific variables on the basis of mean value and standard deviation.

Bivariate sorts of portfolios have been used to analyze the stock returns movement with respect to each pair of the firm specific variables. First, five firm size sorted equal percentile group portfolios have been formed and then each group size portfolios have been further subdivided into five portfolios on the basis of book-to-market equity to allow for variation on stock returns that is unrelated to size. Hence, the sort consists of a total of 25 portfolios sorted on size and then book-to-market equity. Same process has been applied to form portfolios on bivariate sorts of firm size and stock beta, and then book-to-market equity and stock beta. At each these three sets of bivariate sorts of portfolios, the properties of stock returns movement has been observed and analyzed on the basis of mean value.

Diagnostic Checking of the models

One of the assumptions of the regression models specified in the equations (3.1) and (3.3) is the random error terms (e_{it}) are normally distributed with zero mean and equal variance. This assumption asserts that expected values of disturbance terms are not significantly different from zero. These random error terms are assumed to work as surrogates for all those variables that are omitted from the models but that collectively affect the dependent variables. Diagnostic checking is the process of validating model. This study has employed several statistical test of significance for this purpose. These test include the test of significance of regression coefficients, test of autocorrelation, tests of multicolinearity and the test of overall significance of the model. The appraisal of regression models have been performed as described in the following section.

a. Test of Significance of regression coefficients

The test of statistical significance of regression coefficient is a procedure, by which sample results are used to verify the truth or falsity of priori hypothesis, this is study has employed *t*-statistic to perform significance test of regression coefficients. In the language of significance test, a regression coefficient is said to be statistically significant if the critical *p*-value of test statistic is less than the level of significance specified. In other words, the statistical significance of the coefficient validates the explanatory power of the associated independent variables. The levels of significance specified in this study are at 1, 5 and 10 percent level. By the same way, the test a statistic is said to be statistically not significant if the critical *p*-value of the test statistic is greater than the level of significance specified.

b. Test of Autocorrelation

The term autocorrelation refers to the correlation between members of series of observations ordered in time as in time series data or in space as in cross-sectional data (Gujrati, 1995). In the context of regression analysis, the classical linear regression model assumes that such autocorrelation must not exist in the random error terms. In other words, the linear regression model assumes that the random error term of any observation is not related with the random error terms is found to be violated in time series regression, though this problem is not more sounded in cross-sectional regression. However, in cross-sectional data, the problem of spatial autocorrelation might be observed by chance. Such autocorrelation is the correlation in space rather than over time. In the presence of autocorrelation, the regression coefficients do not give unbiased estimates. Therefore, in the essence, the random error terms should not be correlated.

Durbin and Watson (1951) have provided a statistical test of the autocorrelation known as Durbin-Watson (DW) statistics. The problem of autocorrelation has been detected by DW statistics specified in equation (3.5)

$$DW = \frac{\sum_{it=2}^{t=n}(e_{it}-e_{it-1})^2}{\sum_{it=1}^{t=n}(e_{it})^2} \qquad \text{……..(3.5)}$$

The equation (3.5) is simply the ratio of the sum of squared difference in successive error terms to the residual sum of square (RSS). Similarly, the number of observation in the numerator of the DW statistic is '*n-1*' because one observation is lost in taking successive differences. This test specifies a lower bound and 'd_2' of the computer *DW* statistic. If computed *DW* statistic is less than or equal to 'd_2' there is the evidence of positive autocorrelation. On the other hand, if computed *DW* statistic is greater than or equal to '$4\text{-}d_1$', there is the strong evidence of negative autocorrelation. However, if the computed *DW* statistic lies between 'd_u' *to* '$4\text{-}d_u$', there is no evidence to support the problem of autocorrelation. This study follows the similar procedures suggested by Durbin-Watson to detect the problem of autocorrelation.

c. Test of overall significance of the model

Besides the statistical test of significance of individual regression coefficient, it is necessary to test the joint hypothesis that all regression coefficients are simultaneously significant. This is called the test of overall significance (*Adj.* R^2) and *F*-statistics. The adjusted coefficient of determination has been used to identify the percentage of total variation in dependent variable that has been explained jointly by all explanatory variables. The statistical significance test of this joint explanatory power has been conducted by using *F*-statistic. The *p*-value of *F*-test has been examined to confirm whether the regression models are significant at 1, 5 and 10 percent level. Generally, higher value of *Adj.* R^2 and significant *F*-statistics indicate the better explanatory power of the model. However, in empirical analysis it is not usual to obtain very high *Adj.* R^2 but find that some of the regression coefficients either are statistically insignificant or have sigh that are contrary to a priori expectations. Therefore, in this study, more concern has been paid to the logical or theoretical relevance of the explanatory variables to the dependent variables and their statistical significance.

3.5 Variables and Measures

This section explains the firm specific and macroeconomic variables employed in the study along their measurement criteria. The descriptions of the variables are as follows:

a. Stock Return (Rit)

The cross-section of stock returns has been used as dependent variables of the study. The total rate of return associated with common stock consists of the study dividend yield and the capital gain yield. However, for the purpose of this study, the dividend yield component of stock returns has been excluded because of sufficient observation on dividend payment. Hence, the stock returns have been defiend as the rate of change in market price of common stock of a firm during period '*t*' over the period of '*t-1*'. This component of stock returns has been calculated for every period using equation (3.6)

$$R_{it} = \frac{P_{it} - P_{i(t-1)}}{P_{i(t-1)}} \qquad \text{.....(3.6)}$$

In equation (3.6), R_{it} is the annual return on common stock of the i^{th} firm for the year '*t*', P_{it} is the market price per share of common stock of the i^{th} firm at the end of current year '*t*' and $P_{i(t-1)}$ is the market price per share of common stock of the i^{th} firm for the previous year end '*t-1*'.

b. Market Return (RMt)

Market return refers to the rate of return on all stocks in the market portfolio. It has been defined as the rate of change in NEPSE index during year '*t*' over the year '*t-1*' and calculated using equation (3.7)

$$RM_t = \frac{NEPSE_t - NEPSE_{(t-1)}}{NEPSE_{(t-1)}} \qquad \text{.....(3.7)}$$

In equation (3.7), RM_t is the annual return on market portfolio of common stock for the year '*t*', $NEPSE_t$ is the stock market index at the end of year '*t*', and $NEPSE_{(t-1)}$ is the stock market index at the end of the year '*t-1*'.

c. Risk Free Rate (RFt)

Risk-free rate refers to the rate of retuns from investment in risk-free security. The weighted average annualized return on 91-day Treasury bills as reported by Nepal Rastra Bank from the year 1996/97 throgh 2008/09 have been used as proxy for risk-free rate of return in providing empirical estimate of betas. This rate also has been used to determine the excess of stock returns and the excess of market returns over risk-free rate.

d. Stock beta (β)

Stock beta has been used as a proxy of systematic risk associated with common stock returns. For the purpose of obtaining stock betas, excess stock returns have been regressed on excess market returns as in empirical model of CAPM (Sharpe, 1964; Linter, 1965 and Black, 1972). The excess stock returns has been defined as the excess of common stock returns over risk-free rate, and the excess market returns defined as the excess of market returns over risk-free rate.

e. Firm Size (LME)

Firm size is one of the firm specific variables used to explain the variation in the common stock returns. Firm size has different meanings such as size of asset investment, size of scales, and market value of equity. However, in almost all cross sectional studies of common stock returns, firm size has been defined in terms of market value of equity as initiated by Banz (1981). Therefore, firm size in this study has also been defined in terms of natural logarithm of market value of equity. Market value of equity is the total market value of shares of common stock outstanding for a firm at the end of period '*t*' . It has been calculated as market price per share at the end of the period '*t*' multiplied by number of outstanding shares of common stock of a firm at the end of period '*t*'. The firm size has been obtained taking natural logarithm of market value of equity as shown in equation (3.8) as follows:

$$LME_{i,t} = \ln(P_{i,t}N_{i,t}) \quad \text{..... (3.8)}$$

In equation (3.8), $LME_{i,t}$ is the natural logarithm of market value of equity for firm '*i*' at the end of year '*t*', $P_{i,t}$ refers to the market price per share of common stock of the i^{th} firm at the end of year '*i*' and $N_{i,t}$ refers to the number of outstanding shares of common stock of the i^{th} firm at the end of year '*i*'.

f. Book-to-Market Equity (BE/ME)

Book to market equity is the ratio of book value of equity to the market value of equity. It is calculated as book value of equity divided by corresponding market value of equity. Book to market equity has been used as other independent variables to explain cross-section of common stock returns. It has been calculated using equation (3.9)

$$BE/ME_{i,t} = \frac{BE_{it}}{ME_{it}} \quad \text{.....(3.9)}$$

In equation (3.9) $BE/ME_{i,t}$ refers to the ratio of book value of equity to market value of equity of the firm i^{th} firm at the end of year '*t*', $BE_{i,t}$ is the book value of equity of the i^{th} firm at the end of period '*t*' and $ME_{i,t}$ is the market value of equity of the i^{th} at the end of year '*t*'.

3.6 Limitations of the Study

The major limitations of the study are as follows:

a. The firm specific variables chosen for this study are beta, firm size, and book-to-market equity, ratios. Other variables such as sales-to-price and debt-to-equity ratios that studies (for example, Barbee, Mukherji and Raines (1996) among others) have documented have not been covered because significant observations in this study are from banks and financial institutions.
b. This study is based on the assumption of linear relationship between dependent and explanatory variables focusing on Davis's (1994). Thus study

has not considered the non-linearity biases those are normally characterized in stock markets of emerging countries.

c. This study is based on the estimate of stock returns from annual closing prices of shares of listed companies. There is a lack to complete observation associated with daily and monthly closing prices for study period because many firms' stocks have less frequent trading in NEPSE. Therefore, in contrast to Kothari, Shanken and Sloan, Halliwell, Heaney and Sawicki (1999), Wong, Tan and Liu (2006) and Simlai (2009), among others daily or monthly observations could not be used in this study.
d. The significant size of sample and observations in this study are from banks and financial institutions. Common stock trading in NEPSE is dominated by banks and financial institutions. The trading volume and frequency of manufacturing and processing, trading, hotel and other sectors common stock are very negligible. Therefore, the results may be biased to the banks and financial institutions.
e. The number of firm years used in this study is not homogenous among sample firms. It ranges from minimum 2 years to maximum 11 years. Comparatively, banks and financial institutions have relatively larger number of firm's years than other sectors. Therefore, the results may be biased to those firms which have relatively longer study period.

Chapter 4

Presentation and Analysis of Data

The capital asset pricing model of Sharpe (1964), Linter (1965), Mossin (1966) and Black (1972) predicts positive relation between stock returns and stock beta. The underlying hypothesis of the model is that investor's price only systematic risk measured by beta. However, empirical evidences have been documented the results that are not consistent with the central prediction of the CAPM. For example, earnings to price effects of Basu (1977), size effects of Banz (1981), book-to-market effects of Rosenberg, Reid and Lanstein (1985), Chan, Hamao and Lakonishok (1991), and Fama and French(1992), among others, are some of the earlier anomalies that contradict made the CAPM beta effect. In the later period, Fama and French (1996) have reached the same conclusion and advocated that different price ratios such as Book-to-Market ratio and market value of equity, have much the same information about expected returns as such that a market portfolios long in high Book-to-Market stocks and short in low book-to-market stocks and a portfolio that is long in small firms and short in large firms. Though debates on these findings continue, international evidences have appeared to suggest that the premium earned by high Book-to-Market stocks is indeed pervasive and provide parsimonious estimate on stock returns.

Thus, the studies have documented no consistent effects of firm specific variables on stock returns. Though controversies exist among findings from these studies in the context of developed and growing stock markets around the world, little is known about these phenomena in the context of Nepalese stock market. Therefore, this section is devoted to the examining the effects of the firm specific variables on common stocks returns in the context of Nepal by analyzing secondary data associated with variables under consideration.

4.1 Descriptive Statistics

As this study has employed descriptive research design, descriptive statistics have been used to describe the characteristics of stock returns and firm specific variables during the study period. The descriptive statistics used in this study consist of mean, median, standard deviation, and minimum and maximum values associated with variables under consideration. Table 4.1 summarizes the descriptive statistics of the firm specific variables used in this study during the period 2000/01 through 2010/11 associated with 30 sample firms listed in NEPSE.

Table 4.1

Descriptive statistics of firm specific variables associated with 30 sample firm during the period 2000/01 through 2010/11

This table shows descriptive statistics-mean, median, standard deviation, minimum and maximum values of firm specific variables associated with 30 sample firms listed in the population of NEPSE till mid-April 2011 with 210 observations for the period 2000/01 through 2010/11. ME refers to market value of equity defined as number of outstanding shares multiplied by corresponding market shares price per share, BE is the book value of equity on net worth, EPS is the earnings per share, MPS is the market price per share of common stock, BE.ME is the ratio of book value of equity to market of equity, E/P is the ratio of earnings per share to market price per share, LME is the natural logarithm of market value of equity used as the proxy for the firm size, β is common stock beta used as a proxy of systematic risk, R_1 is the annual return of common stock, R_M-R_F refers to the -excess of market return above risk free rate, R_i-R_F refers to the excess of stock returns above risk free rate, and N refers to the number of observations.

Variables	N	Mean	Std. Dev.	Median	Minimum	Maximum
ME (Rs in Million	155	2062.7639	6036.5900	144.0000	6.7500	12227.6750
BE (Rs in Million)	455	359.1576	551.2338	92.9200	-71.4000	3521.6400
EPS(In Rs)	455	35.1336	37.0411	25.7300	-79.0500	285.7200
MPS(In Rs)	455	587.4418	867.5687	270.0000	35.000	7750.0000
BE/ME	455	0.6820	0.5623	0.5883	-0.3245	4.7180
E/P	455	0.0914	0.1201	0.0810	-0.7319	0.8580
LME	455	2.4484	0.8529	2.1584	0.8293	4.8587
B	455	0.9121	2.2643	0.7067	-19.3500	12.4900
R_i	455	0.3129	0.7085	0.1009	-0.7327	4.6198
R_M-R_F	455	0.2015	0.3313	0.2668	-0.3941	0.7439
R_i-R_F	455	0.2763	0.7095	0.0678	-0.7798	4.5776

Market capitalization of equity of the sample firms ranges from minimum Rs 6.75 million to maximum Rs 72,227.678 with an average of Rs. 2,062.7639

million and standard deviation of Rs. 6.036.59 million. The wider range of market capitalization of equity implies that the firm include in the sample varies in terms of their size. The Table 4.1 also reveals that book value of equity or net worth position of the firms varies significantly. It ranges from minimum negative Rs. 71.4 million to maximum positive Rs. 3,521.64 million with a mean value and standard deviation of Rs.359.1576 million and Rs 551.2338 million respectively. The firms also differ in terms of their earnings per share and market price per share. Earnings per share has average value of Rs 35.14 per share with a minimum to maximum range of negative Rs. 79.05 per share to Rs. 285.72 per share respectively, while market price per share falls within the range of minimum Rs. 35 to maximum Rs. 7750 per share with an average value of Rs. 587.4418 to and standard deviation of Rs. 867. 5687. Relatively larger difference in the market price implies that sample firms consist of low to high growth stocks.

Similarly, Book-to-Market equity ratio has mean value of 0.6820 and standard deviation of 0.5623 with minimum to maximum range of negative 0.3245 to positive 4.7189. Table 4.1 also indicates that firms differ significantly in terms of their systematic risk level proxied by stock beta. The stock beta has minimum value of negative 19.35 to maximum positive 12.49 with a mean of 0.9121. The average stock return of the sample firms during the period has been recorded at 0. 3129 with a minimum return of 0.7327 to maximum positive return of 4.6198. The range of minimum to maximum excess stock return is wider than that to excess market return. This implies that average stock returns of the sample firms are more volatile than the market returns.

4.2 Correlation Analysis

The firm specific variables used in this study, particularly, Book-to-Market equity ratio, firms size, stock beta, and stock returns are all scaled version of market price per share or market value of equity. Therefore, it is reasonable to

expect some kind of statistically significant relationship among these pairs of variables. This section therefore is devoted to explaining the direction and magnitude of relationship among different pairs of these firm specific variables including stock returns. The correlation analysis has been performed for this purpose. Table 4.2 presents the value of bivariate Pearson correlation coefficient between different pairs of firm specific variables for the sample period.

As Table 4.2 reports, common stock returns are positively related to stock beta and firm size and the relationship are significant at 1 percent level. On other hand, stock returns are significantly negatively related to book-to-market equity ratio. From among given set of firm specific variables (That is, stock beta, book-to-market equity and firm size), the stock beta reveals stronger positive relation with stock returns than other.

Table 4.2

Bivariate Pearson Correlation Coefficients of Firm Specific Variables

This table reveals the Bivariate Pearson correlation coefficient between different pairs of firm specific variables. R_i, β, E/P, BE/ME and LME are as defined in the table 4.1. The correlation coefficients are based on the data on R_i, β, E/P, BE/ME and LME from 61 sample firms listed in NEPSE till mid-April 2011 with 210 observations for the period 2000/01 through 2010/11. '' sign indicates that correlation is significant at 1 percent level and '**' indicates that correlation is significant at 5 percent level.*

	R_i	β	BE/ME	LME
R_i	1.000			
β	0.526*	1.000		
BE/ME	-0.299*	-0.214*	1.000	
LME	0.210*	0.201*	-0.638*	1.000

Table 4.2 also indicates that correlations among different pairs of explanatory variables are also statistically significant 1 percent level. Among firm related fundamental variables, the highest positive correlations coefficient is recorded at 0.526 between stock returns and stock beta and the highest negative correlations accounted at 0.638 between book-to-market equity and firm size. The other correlations are relatively lower, although most of them are statistically significant. Gujarati (1995) states that high for correlations (in

excess of 0.8) are a sufficient but not necessary condition for the existence of multicolinearity because it can exist even though the correlations are competitively low (less than 0.5). However, low correlations being observed among different pairs of explanatory variables in Table 4.2 gives sufficient evidence to believe that the problem of multicolinearity may not exist in the analysis.

4.3 Analysis of Portfolios Sorted on Stock Beta

Properties of stock returns with the respect to firm specific variables have been analyzed in this subsection by forming five equal percentiles portfolios based on one-way sorts of stock beta and firm size The characteristics of average returns and standard deviations associated with each of these and univariate sorts of portfolios are described below.

Stock beta has been used as the proxy for systematic risk associated with common stocks. For the purpose of analyzing and examining the relationship of stock beta with stock returns and other firm specific variables, five equal percentiles group portfolios were sorted by stock beta. The descriptive statistics (mean and standard deviation) associated with each of these five portfolios groups corresponding to each of the firm specific variables are reported in Table 4.3

Table 4.3

Properties of Portfolios Sorted by Stock beta

This table presents the summary statistics (mean and standard deviation) for the properties of five firm specific variables sorted into five equal percentile group portfolios by stock beta that include total 30 sample firms with 210 observations for the period from 2000/01 to 2010/11. The variables are stock beta (β), stock returns (R_i), natural logarithm of market value of equity (LME), and book-to-market equity (BE/ME) ratio. Figures in the parenthesis are the standard deviations.

Portfolios Sorted by Stock Beta					
	Low 1	**2**	**3**	**4**	**High 5**
$\boldsymbol{\beta}$	-1. 4743 (2.3354)	0.1523 (0.1640)	0. 7078 (0.1635)	1.4045 (0.2741)	3.7525 (2.3687)
$\boldsymbol{R_i}$	0.0331	0.0618	0.1987	0.3401	0.9306

	(0.2596)	(0.0888)	(0.2541)	(0.4980)	(1.2658)
LME	2.1498 (0.7494)	2.1633 (0.7777)	2.5408 (0.9464)	2.7347 (0.9057)	2.6532 (0.6931)
BE/ME	0.8382 (0.4985)	0.8628 (0.7368)	0.6923 (0.5796)	0.5826 (0.4890)	0.4340 (0.3087)
E/P	0.1104 (0.1703)	0.0999 (0.1361)	0.0916 (0.1073)	0.0899 (0.0939)	0.0654 (0.0614)

Table 4.3 shows that common stock returns increase with stock beta when it moves from lowest percentile group portfolios 1 to the highest percentile group portfolios 5. The stock returns on lowest stock beta portfolios is 3.31 percent and it shows a clear pattern of increment with stock beta that reaches to maximum 93.06 percent in highest stock beta portfolio. The results indicates that firm with higher level of systematic risk have larger returns than those with lower systematic risk. Larger returns associated with high-beta stocks represent a premium for systematic risk with a difference of about 90 percent on the portfolio 5 over the portfolio 1. This result is consistent with the notion of CAPM which postulates that stock returns are larger for the firms with larger stock beta and confirms with earlier studies by Black (1972) and Black, Jenson and Scholes (1972), among others, where these studies have noted that market risk factor proxied by beta could predict common stock returns. Similarly, the variability of returns as measured by standard deviation is also larger for high beta stock portfolios as the standard deviation on low-beta stocks is average 25.96 percent each increase to 126.58 percent on the highest beta stocks portfolio.

Table 4.3 also indicates the pattern of movement of other firm specific variables with the respect to stock beta. As the results show, firm size measured by natural logarithm of market values of equity also increases with stock beta from portfolio 1 to 4 and declines slightly in portfolios 5. The firm size in low beta stocks portfolio is equal to 2.1498, which has been increased to 2.7347 in portfolio 4 and then has been declined to 2.6532 in portfolio 5. The result in general imply that larger firms are exposed to higher level of systematic risk than smaller firms. However, book-to-market equity ratio show

the movement in opposite direction with stock beta. Book-to-market equity for low beta stocks portfolio has been recorded at 0.8382, which has declined to 0.4340 in high beta stock portfolio.

Figure 4.1

Trend of movement in Cross-section of average Stock Returns with Respect to Five Stock Beta

The figure shows the plot of average stock returns associated with each of the five stock beta sorted portfolios. The vertical axis measures the stock returns and horizontal axis measures the size of beta sorted five portfolios from lowest stock beta portfolios 1 to highest beta stock portfolio 5. Each dot on the upward moving line in the figure shows plot of stock returns corresponding to stock beta.

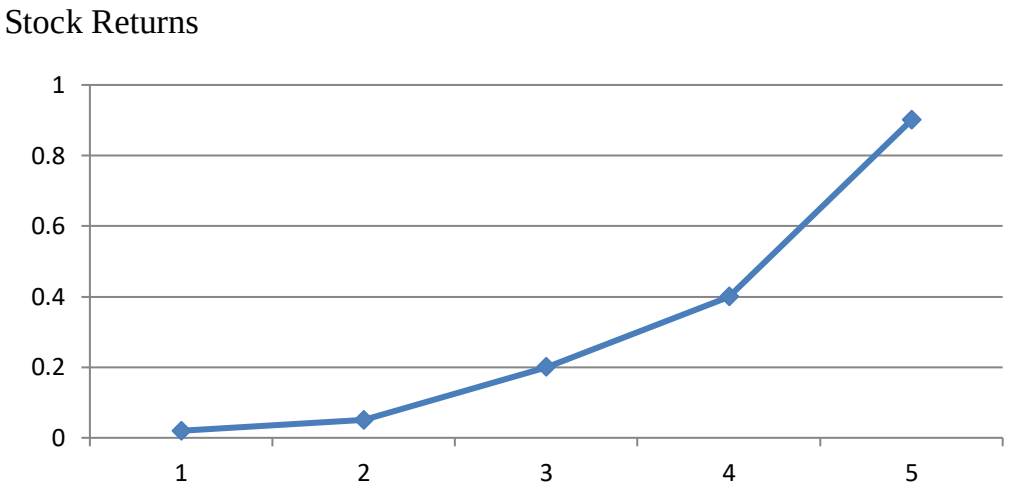


Figure 4.1 shows the graphic pattern of movement in common stock returns with respect to stock beta in five stock beta sorted portfolios. The common stock return line shows a trend of upward movement to the right with increase in beta from portfolio 1 to 5. This implies that common stock returns our larger for the firms with higher systematic risk. Although there is no clear-cut linear trend in the movement in stock returns with stock betas, the positive slope of the line implies that stocks with higher beta have larger returns in general.

4.4 Analysis of Portfolios Sorted on Firm Size

The firm size has been measured by natural logarithm of market value of equity. In order to examine the properties of movement in stock returns and

other firm specific variables with respect to firm size, five equal percentile group portfolios were formed on the basis of univariate sorts by firm size. The descriptive statistics (mean and standard deviation) associated with these portfolios for firm specific variables are shown in Table 4.4.

The common stock returns shows a general pattern of movement into same direction with firm size. In other words, the common stock returns increase with firm size. The common stock returns for the lowest size portfolio (that is, portfolios 1) is 8.25 percent and it has been increased to 60.12 percent in the portfolio 4 and then declines to 45.08 percent is the largest size portfolio (that is, portfolio 5). The results in general indicates that the larger stocks have higher returns. Earlier studies, for example Banz (1981), Chan, Hamao and Lakonishok (1991) and Gomes, Kogen and Zhang (2003), among others have documented that stock returns vary inversely with firm size. Therefore, the results contradict with these studies. However, the result is consistent with Kenz and Ready (1997) where the study revealed that stock returns increase with firm size. The relation to stock returns volatility with respect to firm size, the results indicate that variability is higher for larger stocks in general. The standard deviation shows a general pattern of increment from 41.75 percent in portfolio 1 to 106.27 percent in portfolio 4. Although it has been declined to 69.21 percent in portfolio 5, the results indicate that larger stocks in general have higher variations in returns than the smaller stocks.

Table 4.4

Properties of Portfolios sorted by Firm Size

This table presents the summary statistic (mean and standard deviation) for the properties of five firm specific variables sorted into five equal percentile group portfolios by firm size (measured as natural logarithm of market value of equity) that include total 30 sample firms with 210 observations for the period from 2000/01 to 2010/11. The variables are natural logarithm of market value of equity (LME), stock returns (R_i), book-to-market equity (BE/ME) ratio, and stock beta (β). Figures in the parenthesis are the standard deviations.

Portfolios Sorted by firm Size					
	Low 1	*2*	*3*	*4*	*High 5*
LME	*1.4567 (0.2173)*	*1.8570 (0.0739)*	*2.2251 (0.1886)*	*2.9334 (0.1834)*	*3.7698 (0.3819)*

R_i	*0.0825 (0.4175)*	*0.1697 (0.5608)*	*0.2605 (0.5043)*	*0.6012 (1.0627)*	*0.4508 (0.6921)*
BE/ME	*1.2391 (0.6595)*	*0.9043 (0.4915)*	*0.6654 (0.3752)*	*0.4097 (0.2922)*	*0.1917 (0.1011)*
β	*0.1624 (0.1989)*	*0.1214 (0.0735)*	*0.0771 (0.1098)*	*0.0499 (0.0688)*	*0.0464 (0.0316)*

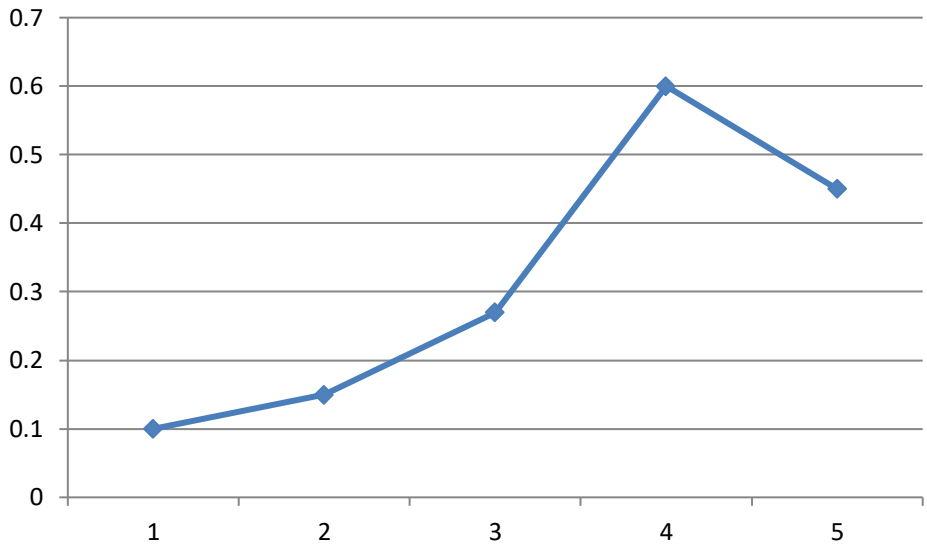
In addition to the pattern of movement in stock return, Table 4.4 also indicates the patterns of movement in other firm specific variables with firm size. The results indicate that book-to-market equity declines with increase in firm size. The book-to-market equity ratio for small firm size portfolio is 1.2391 which has been declined to 0.1917 in large firm size portfolios. On the other hand, stock beta in general increases with firm size. The stock beta in lowest firm size portfolio has average value of 0.3034, which has been increased to 2.0073 in portfolio and then declined to 1.2626 in the highest firm size portfolio. The relationship of movement in stock returns with respect to firm size is graphically depicted in Figure 4.2

Figure 4.2

Trend of movement in cross-section of Average Stock Returns with Respect to five firm size sorted portfolios

This figure shows the plot of average stock returns associated with each of the five firms size sorted portfolios. The vertical axis measures the stock returns and horizontal axis measures the firm size from the lowest size portfolios 1 to highest size portfolio 5. Each dot on the upward moving line in the figure shows plot of stock returns corresponding to firm size.

Stock Returns



Firm Size Sorted Portfolio (Lowest 1 to highest 5)

The stock returns line shows a general upward trend of stock returns, which implies that common stock returns increases with the firm size. As the graph shows, the pattern of increase in stock returns from portfolios 1 to 3 seems to have a linear relation with an equal positive slop. However, the slop of line has been increased when moved from portfolio 3 to 4. Although, the stock returns have been declined when moved from portfolio 4 to 5, the general pattern of movement is stock returns from portfolio 1 to 5 is in increasing trend. Therefore, larger stocks in general have higher returns.

4.5 Analysis of Portfolios Sorted on Book-to-Market Equity

Five equal percentile groups of portfolios were also formed in order to examine the pattern of movement in stock returns and other firm specific variables with respect to the movement in book-to-market equity ratio. Table 4.5 reports the cross-sectional average stock returns on these five BE/ME sorted portfolios along with the standard deviations given in parentheses. The Table also reports the average value of other firm specific variables along with their corresponding standard deviations in five portfolios.

Table 4.5
Properties of Portfolios Sorted by Book-to-Market Equity Ratio

	Portfolio Sorted by Book-to-Market Equity Ratio				
	Low 1	2	3	4	High 5
BE/ME	0.1203 (0.0777)	0.3479 (0.0734)	0.5816 (0.0594)	0.8514 (0.1236)	1.5091 (0.6340)
R_i	0.7740 (1.0907)	0.5208 (0.7802)	0.1552 (0.4141)	0.1119 (0.3115)	0.0028 (0.2073)
LME	3.5313 (0.6442)	2.8095 (0.6376)	2.3074 (0.5265)	1.9721 (0.3860)	1.6216 (0.4044)
β	1.7646 (3.6019)	1.3988 (2.0146)	0.8999 (1.7169)	0.3847 (1.3359)	0.1127 (1.4823)

Table 4.5 shows a clear pattern of movement in common stock returns with respect to book-to-market equity ratio. The returns show a steady declining trend from smallest book-to-market equity group to the largest book-to-market equity. The returns on the smallest BE/ME group is 77.40 percent which has been declined to 0.28 percent in the highest BE/ME group. This implies that lower BE/ME firms have higher return than higher BE/ME firms with a return premium of about 77 percent. The negative trend of movement in common stock returns in response to the movement in book-to-market ratio observed in this study is contradicted with earlier findings by Stattman (1980), Rosenberg, Reid and Lanstein (1985), and Fama and French (1992), among others, where these studies have documented that stock returns increase with book-to-market equity. However, the result confirms to the previous study by Prasai (2010) in the context of Nepal.

The results further indicate that variation in common stock returns is higher in low book-to-market equity group than that in high book-to-market equity group. The standard deviation of common stock returns in the lowest BE/ME portfolio is 109.07 percent whereas that in the highest BE/ME portfolio is only 20.73 percent. The results in Table 4.5 also reveal that the other firm specific variables have specific pattern of movement with respect to the movement in book-to-market equity. For example, firm size shows a clear negative pattern of movement with book-to-market equity. The firm size denoted by natural logarithm of market value of equity for low BE/ME group is 3.5313, which has

been declined in high BE/ME group to 1.6216. Furthermore, the stock beta also shows a negative pattern of movement with book-to-market equity. The stock beta has been declined from 1.7646 in low BE/ME portfolio to 0.1127 in high BE/ME portfolio. This result implies that systematic risk denoted by stock beta is higher for the firms with low book-to-market equity ratio, and hence the common stock returns are also higher for the low book-to-market equity group.

4.6 Regression Results

In order to test the statistical significance and robustness of the results, this study also relies on secondary data analysis based on cross-sectional regression model specified in chapter 3. It basically deals with regression results from various specifications of the model 1 to examine the estimated relationship of common stock returns with firm specific variables for cross-sectional data of 30 sample firms that include 210 observations during the period 2000/01 through 2010/11. In this section, an attempt also has been made to test the validity of the model through statistical test of significance such as *t*-test, adjusted coefficient of determination (*Adj*. R^2), and the test of autocorrection and multicolinearity. The regression results have been reported in Table 4.6

The model specifications I and IV report the simple regression results, where stock returns have been regressed on various firm specific variables individually. The specifications V through IX report the multiple regression results, where various firm specific variables taken together have been used as regressors. The full version of the model has been reported in specification X, where all the firm specific variables have been used as explanatory variables.

Table 4.6

Estimated Relationship from Cross-Sectional Regression of Stock Returns on Beta, Firm Size, and Book-to-Market Equity Ratio

This table shows regression results of stock returns on four firm specific variables based on pooled cross-sectional data of 30 firms listed in NEPSE with 210 observations from the year 2000/01 to 2010/11. The regression results consist of various specifications of the model in the form of simple and multiple regressions. The reported values are intercepts and slope coefficients of respective explanatory variables with t-statistics in the parenthesis. Dependent variable is the stock return denote

as R_{it} and independent variables are stock beta (β_{it}). The reported results also include the values of F-statistics (F), adjusted coefficient of determination (Adj. R^2), and standard error of estimate (SEE). The asterisk (*) sign indicates that result is significant at 1 percent level.

Model	Intercept	β	LME	BE/ME	F	Adj. R^2	SEE
I	0.163 (5.339*)	0.165 (13.170*)			173.440*	0.275	0.603
II	-0.114 (-1.150)		0.174 (4.567*)		20.862*	0.042	0.693
III	0.570 (11.419*)			-0.377 (-6.670*)	44.493*	0.087	0.677
IV	-0.052 (-0.608)	0.158 (12.452*)	0.090 (2.683*)		91.504*	0.285	0.599
V	0.343 (7.247*)	0.152 (12.137*)		-0.246 (-4.893*)	103.083*	0.310	0.588
VI	0.487 (3.073*)		0.027 (0.549)	-0.351 (-4.781*)	22.363*	0.086	0.677
VII	0.394 (2.855*)	0.152 (12.116*)	-0.017 (-0.399)	-0.262 (-4.076*)	68.647*	0.309	0.589

The simple regression result of stock returns on beta in specification I shows a positive relationship of stock return with stock beta. The slope coefficient of stock beta is significant at 1 percent level which implies that stock returns increases with stock beta. The reported *F*-statistic (173.44) is also significant at 1 percent level meaning that the model explains between the stock returns. However, the result also indicated that the intercept term is significantly different from zero. The empirical validity of the CAPM lies on the notion that stock returns should have significant positive linear relations with stock beta and the intercept term should not be statistically significant. The statistical significance of the intercept term in this study raises a doubt on empirical validity of the CAPM in the context Nepalese stock market. This result is consistent with Black, Jenson and Scholes (1972) where the study reported a linear empirical market line with positive tradeoff between return and market risk denoted by beta. However, the intercept term in the study was also found statistically different from zero that rejected empirical validity of the CAPM.

Similarly, the regression result of stock returns on firm size in specification II shows a positive relationship between stock returns and firm size and the regression coefficient of firm size is statistically at 1 percent level. Although, reported *F*-statistic (20.862) is also significant at 1 percent level, the adjusted

coefficient of determination is only 0.042 which is very low. It implies that only 4.2 percent of the total variations is common stock returns are captured by firm size. In another simple regression result of specification III, common stock returns are observed to be negatively related with book-to-market equity and coefficient is again significant at 1 percent level. However, the result indicates that only 8.7 percent variations in common stock returns are captured by book-to-market equity. The regression of common stock returns are captured by book-to-market equity. In all simple regressions, except specification I, despite of statistical significance of *F*-value the firm specific variable such as firm size, book-to-market equity, and earning-to-price ratio individually explains small variations in common stock returns as indicated by adjusted R^2 in the respective model specifications.

The results of simple regressions in model specifications I through III establish the robustness of results obtained in the analysis of one-way sort of portfolios formed on stock beta, firm size, and book-to-market equity. As an additional check of the robustness of results, two or more firm specific variables have been included as explanatory variables in multiple regressions of specification IV through VII. When both stock beta and firm size are included as explanatory variables, both variables still maintain their observed direction of relation with stock returns, and respective coefficients are also significant at 1 percent level. Further, the inclusion of stock beta and book-to-market equity as explanatory variable shows that these variables have retained their observed direction of relationship and statistical significance. The explanatory power of the models has also been improved in with the inclusion of these variables. However, use of firm size and book-to-market equity together as regressors has provided an important insight into the regression results. The results indicate that book-to-market equity still maintains its statistical significance and observed direction of relation because BE/ME coefficient is again negative and significant at 1 percent level, while firm size loses its statistical significance although the observed direction of relationship is positive. Hence, although this result confirms the result obtained in bivariate sort of portfolio formed on size and

book-to-market equity in relation to observed direction of relationship statistical validity of results cannot be established since firm size coefficient is not significant. These results suggest that stock beta and book-to-market equity consistently predict the stock if returns where as firm size does not.

In specification VII, three variables, namely stock beta, firm size and book-to-market equity, have been used as explanatory variables. The results shows that stock returns have significant negative relation with book-to-market equity. However, a surprising result has been obtained in relation with book-to-market. However, s surprising result has been obtained in relation to firm size that its observed direction of relation has been reserved although the size coefficient is not statistically significant.

This study hypothesized that common stock returns are positively related to stock beta, book-to-market equity and earnings-to-price and negatively related with firm size. Thus, the observed relationship of common stock returns with stock beta is according to priori sign expectation although the priori sign expectations do not hold with other firm specific variables. Firm size, is significant in specification II and IV but with an unexpected sign. This implies that large companies in Nepal tend to outperform small companies. Among all, stock beta and book-to-market equity have been observed as the best predictors because coefficients are statistically and economically significant across on the specifications. The sign of the coefficients of stock betas across on the specifications are according to the priori expectation. However, intercept terms across all specifications with beta as explanatory variables are also significant except in specification IV. This implies that though beta serve as a good predictor of stock returns, underlying assumption of CAPM does not hold in Nepalese stock market.

The explanatory power of the model indicated by adjusted coefficient determination have also been improved in the specifications where beta is explanatory variable along with other firm specific variables, and it is the best in model VI where adjusted R^2 is 0.31. Overall, firm size and earning-to-price

have been observed as poor predictor of stock returns because their effects have been subsumed by stock beta and book-to-market equity is multiple regressions. The result obtained in this study support the arguments of Gaun , Hansen, Leikam, and Shaw (2007) in a ground that the CAPM claims differences in stock returns that are caused by differences in risk as measured by beta but does not exclude the possibility that the stock returns can also be related with other firm specific variables. In relation to firm size and book-to-market equity effect the results also confirm to the Kim (1997) and Chau and Wang (2004) where these studies observed significant book-to-market equity and no firm size effect on stock returns. In contrast, the results contradict with Wong, Tan, and Liu (2006) in relation to observed direction of relationship as they have documented negative relation of stock returns with beta and firm size and positive relation with book-to-market equity ratio.

In cross sectional regression, data are often connected on the basis of up probability sample of cross-sectional firms so that there is no prior reason to believe that the error term pertaining to one firm is correlated with error term, it is called spatial autocorrelation, that is, correlation in space rather than over time. However, it is important in cross-sectional analysis that the ordering of the data must at same logic, for economic interest, to make sense of any determination of whether spatial autocorrelation is present or not. In this study, cross-sectional data have the ordering over time so that there is need to detect the problem of autocorrelation, and it has been confirmed by using Durbin-Watson (DW) *d*-statistic.

Table 4.7

Durbin-Watson Statistics and variance inflationary factors of the model

Specification	Explanatory Variables	DW-statistic	d_L	d_U	4-d_U	VIF
I	*β*	1.982	1.664	1.684	2.316	1.000
II	*LME*	1.839	1.664	1.684	2.316	1.000
III	*BE/ME*	1.723	1.664	1.684	2.316	1.000
IV	*β* *LME*	1.943	1.653	1.693	2.307	1.042 1.042
V	*β* *BE/ME*	1.864	1.653	1.693	2.307	1.048 1.048
VI	*LME*	1.725	1.653	1.693	2.307	1.687

	BE/ME					1.687
VII	*β* *LME* *BE/ME*	1.863	1.643	1.704	2.296	1.056 1.699 1.710

Similarly, in a multiple regression analysis, the problem of multicolinearity is more prominent. Therefore, the diagnostic check of the model has been conducted using variance inflationary factor (VIF) of explanatory variables to detect the multicolinearity problem, if any, associated with multiple regression of specification IV to VII. The values of DW statistics and VIF associated with several specifications of the model are reported in Table 4.7

As argued by Durbin and Watson (1951), if computed *DW* is less than lower bound critical value (d_L), there is enough evidence to believe that the problem of positive autocorrelation exists. If it lies between d_U to $4\text{-}D_U$, there is no evidence of autocorrelation. However, if completed *DW* falls in between of lower and upper bound critical values, the result is inconclusive as to whether the problem of autocorrelation exists or not. Table 4.11 indicates that computed *DW* for all the model specifications falls in between d_U to $4\text{-}D_U$ so that there is no evidence of autocorrelation. With regard to multicolinearity, the Table 4.7 also shows that variance inflationary factors (VIF) of explanatory variables across all the model specification are significantly lower than 10. Therefore, there is also no evidence of multicolinearity in the regression model.

Chapter 5

Summary, Conclusions and Recommendations

5.1 Summary

The studies associated with cross-sectional variation in common stock returns provide an important insight into the understanding of pricing implication of common stock. Much attention have been paid in past in this regard to explore what determines common stock returns in the context of developed capital markets. In recent years, studies have started to examine this phenomenon in the context of emerging markets around the globe as well. However, little efforts have been made to explore this issue in the context of Nepalese Stock Market. Stock market in Nepal has been Experiencing a bearish trend since last few years and has been more volatile than ever in past. Monopoly market structure, very less practice of financial analysis among investors, immature and uncompetitive broker services, poor regulation and governance structure, lack of investment awareness program, unfavorable political environment, and unbalanced structure of market are some of the major characteristics of Nepalese Stock Market. Within the avenue of these features, the market is also experiencing limited volume of trading, few investors, absence of professionalism, slow market growth, limited information available to investors, and so on. As a result, there exists an unpredictable environment as to what affects stock returns in Nepal. Therefore, this study attempted to identify how different firm specific variables affect cross-sectional stock returns in the context of Nepal.

The studies on pricing implication of common stocks began since the publication of seminal work of Markowitz (1952) - the mean-variance portfolio theory. Following the underlying assumptions of the portfolio theory, Sharpe (1964), Linter (1965), and Black (1972) then proposed widely argued asset pricing theory- the capital asset pricing model (CAPM). The CAPM

hypothesized that investors price only systematic risk measured by beta. The model predicts a positive relation between stock returns and beta. Empirical studies of U.S. stock markets, however, showed significant relations between stock returns and several firm specific variables, some of which explain stock returns better than beta. For example, Basu (1977) found that stocks wi if cancel th low price-to-earnings ratios have higher average returns than stocks with high price-to-earnings ratios. Similarly, Banz (1981) showed that stocks of firms that are small in terms of market value of equity (defined as firm size) have higher beta-adjusted returns than stocks of larger firms. Further, Fama and French (1992) examined the joint role of beta, size, leverage, book-to-market equity, and earnings-to-price and documented that firm's size and book-to-market equity ratio have significant predictive power to explain cross-sectional variation in common stock returns. Since then, the studies have evolved the attempts to identify firm specific characteristics which explain differences in common stock returns.

This study basically aimed at examining the cross-sectional variations in common stock returns with respect to firm specific variables. The specific objectives of the study are: (a) To analyze the relationship between stock returns and firm specific variables (b) to evaluate CAPM in explaining stock returns in Nepal, (c) to examine whether CAPM beta alone can predict stock returns, or inclusion of firm size and book-to-market equity subsume the beta effect on stock returns, (d) to evaluate whether inclusion of this variable subsume the effect of beta, firm size, and book-to-market equity.

This study relied on the use of secondary sources of data. The data used to examine cross-sectional variations in common stock returns consist of total 210 observations of a sample of 30 enterprises listed in NEPSE during the period 2000/01 through 2010/11. The firm specific variables used in the study are firm size, book-to-market equity and earnings-to-price ratios including stock beta.

The method used to analyze the properties of movement in common stock returns include one-way sort of portfolio formed on stock beta, firm size, book-

to- market and earnings-to-price ratios. The methods also include correlation analysis, simple and multiple linear cross-sectional regressions, empirical CAPM to identify the directions and magnitudes of relationship between common stock returns and firm specific variables. The regressions were run to identify the effect size of these explanatory variables on common stock returns. Both parametric and non-parametric tests were used to test the significance of the parameters and models. The results indicate that stock beta and book-to-market equity ratios are the most significant predictor of common stock returns in Nepal across all the analyses and models.

Based on the analysis of data, the major findings of the study are summarized as follows:

Major Findings

1. The analysis of the one-way sort of portfolios on stock beta, firm size, book-to-market equity shows that larger firms and the firms with larger stock betas have higher returns, where as the firms with high book-to-market equity and earnings yield ratios have lower returns. The results indicate that variability associated with common stock returns is larger for the firm larger size and stock beta while it is lower for the firms with high book-to-market equity and earnings-to-price ratios.
2. In simple regressions of stock returns on each of the firm specific variables (stock beta, firm size, book-to-market equity), the study reveals a significant positive relationship of stock returns with stock beta and firm size, and a significant negative relationship with book-to-market and earnings-to-ratios. The stock beta, firm size, and book-to-market coefficients are 0.165, 0.174, and -0.377 respectively and all are significant at 1 percent.
3. Multiple regression of stock returns on stock beta and firm size also reveals significant positive relation of stock returns with both stock beta and firm size. The regression coefficient of stock beta is 0.158 and size coefficient is 0.090 and both are significant at 1 percent level.

4. The results of multiple regression of stock returns on stock beta and book-to-market equity also reveal a significant positive relation of stock returns with stock beta and a significant negative relation with book-to-market equity ratio. The stock beta coefficient is 0.152 and 0.246 and both are again significant at 1 percent level.
5. The regression results of stock returns on firm size and book-to-market equity in a multiple regression show that firm size looses it statistical significance although the sign of the size coefficient is positive. Book-to-market equity still has its consistent negative coefficient of -0.351 significant at 1 percent level.
6. Inclusion of stock beta as one of the explanatory variable in multiple regressions along with firm size, and book-to-market equity shows the negative sign of size coefficient, although it is not significant. However, the coefficient of stock beta is still positive and that of book-to-market equity is negative, both are significant at 1 percent level. This multiple regression results confirm the significant role of stock beta and book-to-market equity in predicting stock returns.
7. In a multiple regression of complete form, where all explanatory variables have been included, only stock beta and book-to-market equity are found to have significant explanatory power while size and earnings-to-price effects are not significant.

5.2 Conclusion

The major conclusion of this study is that the firm size and earnings-to-price ratios do not explain the common stock returns in the context of stock market in Nepal. The results show the inconsistent relationship of firm size and earnings-to-price with common stock returns, and hence their effects are not conclusive. On the other hand, book-to-market equity and stock beta

effects on common stock returns are consistent across all the analyses and all the specifications of the model. The results indicate very strong role of stock beta and book-to-market equity to explain common stock returns in Nepal. Stock beta has consistently significant explanatory power in all the models indicating that stocks with higher beta have higher returns.

Similarly, book-to-market equity also has consistent significant negative relation with stock returns in all cases. The results associated with positive and significant relationship between stock returns and beta do not support the findings of some earlier studies such as by Basu (1977), Banz (1981), Bhandari (1981), Stambaugh (1982), Fama and French (1992), among others. Although, the results support underlying hypothesis of the Sharpe (1964), Linter (1965), and Black (1972) that average stock returns are positively related to market beta, the empirical validity of CAPM cannot be established because intercept term in CAPM empirical model is also significant. Market risk factor and size factor have significant positive relation with excess returns and book-to-market factor has significant negative relation. However, the direction of relationship between size and book-to-market equity factors and excess stock return contradicts with priori hypothesis. The findings of this study thus present some surprising results in relation to role of firm specific variables.

5.3 Recommendations

The study reveals that the cross-section of stock returns can be explained by stock beta and book-to-market equity ratio. Therefore, investors are recommended to examine the market risk factor proxied by beta and the book-to-market equity ratio before making stock investment choice in the context of Nepal.

This study used annual closing price of shares of common stock to provide an estimate of stock returns and annual closing NEPSE index to calculate market return. Annual Closing price and stock indexes are suffered from high deviations and thus inflate the annual returns. Therefore, future studies should be directed towards computing returns from daily or weekly or monthly observations of closing prices.

This study has assumed linear relationship between stock returns and explanatory variables. In emerging markets, it is expected that there exists non-linearity. Moreover, emerging markets are categorized by less frequent transactions termed as thin trading. In order to incorporate these issues, the future studies are suggested to apply non-linear models to test the predictive power of explanatory variables.

This study used few firm specific variables to access the cross-sectional and variations in stock returns. Inclusions of some other variables, for example cash flow to price (Chan, Hamao and Lakonishok (1991)), leverage (Fama and French (1992)), annual sales growth (Davis (1994)), sales-to-price and debt-to-equity ratio (Barbee, Mukherji and Raines (1996)), may provide an important insight into the cross-sectional relationship of common stock returns in Nepal.

Bibliography

Adel, A. S. (2004). The dynamic relationship between macroeconomic factors and the Jordanian stock market. *International Journal of Applied Econometrics and Quantitative Studies*, Vol. 1(1), pp. 97-114.

Adjasi, C. K.D. (2009). Macroeconomic uncertainty and conditional stock price volatility in frontier African markets: Evidence from Ghana. *Journal of Risk Finance*, Vol. 10(4), pp. 333-349.

Al-Khazali, O.M. (2004). The generalized Fisher hypothesis in the Asian Markets. *Journal of Economic Studies*, Vol. 31(2), pp. 144-157.

Banz, R.W. (1981). The relationship between returns and market value of common stocks. *Journal of Financial Economics*, Vol. 9 (1), pp. 3-18.

Barbee, Mukherji, and Raines (1996). Do sales-price and debt-equity explain stock returns better than book-market and firm size? *Financial Analysts Journal*, Vol. 52(2), pp. 56-60.

Baskota, N. P. (2007). *Stock Price Volatility in Nepal*. Unpublished M. Phil. Dissertation, Office of the Dean, Faculty of Management, Tribhuvan University.

Basu, S. (1977). Investment performance of common stocks in relation to their price earnings ratios: A test of efficient market hypothesis. *Journal of Finance*, Vol. 32(3), pp. 129-156.

Bhandari, L.C. (1988). Debt-equity ratio and expected common stock returns: Empirical evidence. *Journal of Finance*, Vol. 43(2), pp. 507-528.

Black, A.J. (2006). Macroeconomic risk and the Fama-French three-factor model. *Managerial Finance*, Vol. 32(6), pp. 505-517.

Black. F., Jensen, M.C. and Scholes, M. (1972). The capital asset pricing model: Some empirical tests. *Studies in the Theory of Capital Market*, pp. 79-124.

Blume, M. and Friend, I. (1973). A new look at the Capital Asset pricing Model. *Journal of Finance*, pp. 19-34.

Calvet, A. and Lefoll, J. (1989). Risk and return on Canadian capital markets: Seasonality and size effect. *Journal of the French Finance Association*, Vol. 10, pp. 21-39.

Chan, L.K.C., Hamao, Y. and Lakonishok, J. (1991). Fundamentals and stock returns in Japan. *Journal of Finance*, Vol. 46(5), pp. 1739-1764.

Chou, P. H., Chou, R. K. and Wang, J. S. (2004). On the cross-section of expected stock returns: Fama-French ten years later. *Finance Letters*, Vol. 2(1), pp. 18-22.

Daniel, K., Titman, S. (1997). Evidence on the characteristics of cross-sectional variation in stock returns. *Journal of Finance*, Vol. 52, pp. 1-33.

Davis, J.L. (1994). The cross-section of realized stock returns: The Pre-COMPUSTAT evidence. *Journal of Finance*, Vol. 49(5), pp. 1579-1593.

Debondt, W. and Thaler, R. (1987). Further evidence on investor overreactions and stock market seasonality. *Journal of Finance*, Vol. 42, pp. 557-581.

Dennis, P., Perfect, S.B., Snow, K.N., and Wiles, K.W. (1995). The effects of rebalancing on size and book-to-market ratio portfolio returns. *Financial Analysts Journal*, Vol. 51(3), pp. 47-57.

Dhakal, D., Kandil, M. and Sharma, S. C. (1993). Causality between the money supply and share prices: A VAR investigation. *Quarterly Journal of Business and Economics*, Vol. 32, pp. 52-74.

Durbin, J. and Watson, G.S. (1951). Testing for serial correlation in least-square regressions. *Biometrika*, Vol. 38, pp. 159-171.

Elton, E.J. and Gruber, M.J. (1991). *Modern Portfolio Theory and Investment Analysis*. New York: John Wiley and Sons Inc.

Engle, R.F. and Granger, C.W. (1987). Co-integration and error correction: Representation, estimation and testing. *Econometrica*, Vol. 55, pp. 251-276.

Ewing, B.T. (2002). Macroeconomic news and the returns of financial companies. *Managerial and Decision Economics*, Vol. 23(8), pp. 439-446.

Fama, E.F. (1981). Stock returns, real activity, inflation and money. *American Economic Review*, Vol. 71, pp. 545-565.

---------- and French, K.R. (1992). The cross-section of expected stock returns. *Journal of Finance*, Vol. 47(2), pp. 427-465.

----------. (2008). Average return, B/M, and share issue. *Journal of Finance*, Vol. 63(6), pp. 2971-2995

Friend, I. and Blume, M. (1970). Measurement of portfolio performance and uncertainty. *American Economic Review*, pp. 561-575.

Gaunt, C. (2004). Size and book-to-market effects and Fama French three-factor asset pricing model: Evidence from the Australian stock market. *Accounting and Finance*, Vol. 44. pp. 27-44.

Gomes, J., Kogan, L. and Zhang, L. (2003). Equilibrium cross-section of returns. *The Journal of Political Economy*, Vol. 111(4), pp. 693-732.

Granger, C.W.J. (1969). Investigating causal relations by econometric models and cross spectral methods. *Econometrica*, pp. 424-438.

Grauer, R. R. (1999). On the cross-sectional relation between expected returns, betas, and size. *Journal of Finance*, Vol. 54 (2), pp. 773-789.

Griffin, J. M. and Lemmon, M. L. (2002). Book-to-market equity, distress risk, and stock returns. *Journal of Finance*, Vol. 57(6), pp. 2317-2336.

Guan, L., Hansen, D. R., Leikam, S. L. and Shaw, J. (2007). Stable betas, size, earnings-to-price, book-to-market and the validity of the capital asset pricing model. *Managerial Finance*, Vol. 33(8), pp. 595-614.

Gujarati, D.N. (1995). *Basic Econometrics*. Singapore: McGraw Hill Inc.

Handa, P., Kothari, S.P. and Wasley, C. (1989). The relationship between the return interval and betas-implications for the size effects. *Journal of Financial Economics*, Vol. 23, pp. 79-100.

Hawawini, G. and Viallet, C. (1987). Seasonality, size premium and the relationship between risk and return of French common stock. *Working Paper*, INSEAD, Fontainebleau, France.

Hussainey, K. and Ngoc, L. K. (2009). The impact of macroeconomic indicators on Vietnamese stock prices. *Journal of Risk Finance*, Vol. 10(4), pp. 321-332.

Jaffe, J., Keim, D.B. and Westerfield, R. (1989). Earnings yield, market values, and stock returns. *Journal of Finance*, Vol. 44 (1), pp. 135-148.

---------- and Mandelker, G. (1976). The Fisher effect for risky assets: An empirical investigation. *Journal of Finance*, Vol. 31, pp. 447-458.

Jagadeesh, N. (1992). Does market risk really explain the size effect? *Journal of Financial and Quantitative Analysis*, Vol. 27, pp. 337-351.

K.C., I. D. (2009). *The Cross Section of Expected Stock Returns: The Evidence of Nepal*. Unpublished M. Phil. Project Work, Office of the Dean, Faculty of Management, Tribhuvan University.

Keim, D.B. (1983). Size related anomalies and stock return seasonality. *Journal of Financial Economics*, Vol. 12, pp. 13-32.

Kim, D. (1995). The errors-in-variables problem in the cross-section of expected stock returns. *Journal of Finance*, Vol. 50, pp. 1605-1634.

----------. (1997). A reexamination of firm size, book-to-market, and earnings-price in the cross-section of expected stock returns. *Journal of Financial and Quantitative Analysis*, Vol. 32(4), pp. 463-489.

Knez, P.J. and Ready, M.J. (1997). On the robustness of size and book-to-market in cross-sectional regressions. *Journal of Finance*, Vol. 52(4), pp. 1355-1382.

Kothari, S.P., and Shanken, J. and Sloan, R. G. (1995). Another look at the cross-section of expected return. *Journal of Finance*, Vol. 50(1), pp. 185-224.

Kumar, M. and Sehgal, S. (2004). Company characteristics and common stock returns: The Indian experience. *Investment Management and Financial Innovations*, Vol. 4, pp. 89-99.

Lakonishok, J., Shleifer, A. and Vishny, R.W. (1994). Contrarian investment, extrapolation and, risk. *Journal of Finance*, Vol. 49(5), pp. 1541-1578.

La Porta, R. (1996). Expectations and the cross-section of stock returns. *Journal of Finance*, Vol. 51(5), pp. 1715-1742.

Lee, B.S. (1992). Causal relations among stock returns, interest rates, real activity and inflation. *Journal of Finance*, Vol. 47, pp. 1591-1603.

Linter, J. (1965). The valuation of risk assets and the selection of risky investments in stock portfolios and capital budgets. *Review of Economics and Statistics*, Vol. 47, pp. 13-37.

Loughran, T. (1997). Book-to-market across firm size, exchange and seasonality: Is there an effect? *Journal of Financial and Quantitative Analysis*, Vol. 32(3), pp. 249-268.

Markowitz, H. (1952). Portfolio selection. *Journal of Finance*, Vol. 7(1), pp. 77-99.

Merton, R.C. (1973). An inter-temporal capital asset pricing model. *Econometrica*, Vol. 41, pp. 867-887.

Michailidis, G., Tsopoglou, S. and Papanastasiou, D. (2007). The cross-section of expected stock returns for the Athens Stock Exchange. *International Research Journal of Finance and Economics*, Vol. 8, pp. 63-96.

Miller, M. and Scholes, M. (1972). Rates of return in relation to risk: A re-examination of some recent findings. *Studies in Theory of Capital Market*, pp. 47-78.

Mosin, J. (1966). Equilibrium in a capital asset market. *Econometrica*, Vol. 34, pp.768-783.

Pinfold, J.F., Wilson, W.R. and Li, Q. (2001). Book-to-market and size as determinants of returns in small illiquid markets: The New Zealand case. *Financial Services Review*, Vol. 10, pp. 291-302.

Pradhan, R.S. (1993). Stock market behavior in a small capital market: A case of Nepal. *The Nepalese Management Review*, pp. 20-32.

----------and Balampaki, S.B. (2004). Fundamentals of stock returns in Nepal. *SEBON Journal*, Vol. 1, pp. 8- 24.

Prasai, B. K. (2010). *CAPM Anomalies and Pricing of Equity: A Case of Nepal*. Unpublished M. Phil. Dissertation, Office of the Dean, Faculty of Management, Tribhuvan University.

Roll, R. (1977). A critique of the asset pricing theory's test, part 1: On past and potential testability of the theory. *Journal of Financial Economics*, Vol. 4, pp. 129-176.

Rosenberg, B., Reid, K. and Lanstein, R. (1985). Persuasive evidence of market inefficiency. *Journal of Portfolio Management*, Vol. 11, pp. 9-17.

Ross, S.A. (1976) The arbitrage theory of capital asset pricing. *Journal of Economic Theory*, Vol. 13, pp. 341-360.

Sharpe, W.F. (1964). Capital asset prices: A theory of market equilibrium under conditions of risk. *Journal of Finance*, Vol. 19, pp. 425-442.

Simlai, P. (2009). Stock returns, size, and book-to-market equity. *Studies in Economic and Finance*, Vol. 26(3), pp. 198-212.

Stattman, D. (1980). Book values and stock returns. *The Chicago MBA: A Journal of Selected Papers*, Vol. 4, pp. 25-45.

Wong, K.A. and Lye, M.S. (1990). Market values, earnings yields and stock returns. *Journal of Banking and Finance*, Vol. 14, pp. 311-326.

Reports

Nepal Rastra Bank (2010). *Quarterly Economic Bulletin*. Kathmandu: NRB

Nepal Rastra Bank (2011). *Quarterly Economic Bulletin*. Kathmandu: NRB.

Nepal Stock Exchange Limited (1995/96). *Financial Statements of Listed Companies*. Kathmandu: NEPSE

Nepal Stock Exchange Limited (1997/98). *Financial Statements of Listed Companies*. Kathmandu: NEPSE

Nepal Stock Exchange Limited (2000/01). *Financial Statements of Listed Companies*. Kathmandu: NEPSE

Nepal Stock Exchange Limited (2008/09). *Annual Trading Report*. Kathmandu: NEPSE

Securities Board of Nepal (2007). *Annual Report*. Kathmandu: SEBON.

Websites

www.nepalstock.com

www.nrb.org.np

www.sebon.gov.np