

Financial Risk And Share Price Behavior

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Abstract: Financial risk fluctuations have a significant effect on overall economy. Macroeconomic variables and stock return are related to each other. Financial risk and share price behavior has been investigated in this dissertation. For this purpose, monthly data from 2003 to 2012 and annual data for period of 2003 to 2012 has been used. The stock return data of 115 companies has been used as dependent variable where as exchange rate, interest rate, financial exposure, firm size, total risk, growth rate and profitability has been used as independent variable. This study employs multivariate regression analysis. This study is focused on financial risk and its impact on firm through different dimensions, first on industry level, then on firm level and lastly analysis for exporting and non-exporting firms has been done. The industry level analysis shows that statistically significant negative relationship exists between exchange rate, interest rate and stock return. The relationship of total risk, foreign exposure, firm size and growth rate is found insignificant with industry returns. The firm level analysis is done from different dimensions. The interest rate is negatively related to monthly returns of the firm and this relationship is found significant. The relationship of total risk, foreign exposure, firm size and growth rate is found insignificant with firm level stock returns. For exporting and non-exporting firms, the study shows positive relationship between interest rate and firm stock returns, and this relation is stronger in exporting firms as compare to other firms operating in same industry. Whereas negative relationship between exchange rate and firm stock return. Thus this dissertation is a spatial extension of the previous researches. Instead of taking the all monetary variables like previous research, this research's focus on firm analysis by using two factor model.

Keywords: Financial risk, exchange rate, interest rate, share price behavior, macroeconomic variables, monetary variables.

1. INTRODUCTION

Financial risk has a significant effect on overall economy. Financial market's uncertainty and public confidence are interlinked. If excessive unpredictability exists, then the role of stock prices as "indicator" of fundamental value of a firm is badly affected. Risk management exercise focuses on instability estimation and forecasting tools globally. Effective risk management of economy requires a good understanding of instability in share price and financial risk. The research begins with a definition of "Financial risk and Share price" that establish the scope of review. Risk is uncertainty about future outcomes or possibility that actual outcome may be different from desired outcome. Risk has been broadly classified into two main categories i.e. systematic risk and unsystematic risk. Systematic risk is based on macroeconomic factors and is undiversifiable. Unsystematic risk is based on microeconomic variables i.e. company specific and is diversifiable. Systematic risk is further sub-categorized into business risk and financial risk. Business risk is uncertainty about future income flows, increase in uncertainty of business leads to high risk and high returns. Financial risk is uncertainty about financing method a firm use for its investment. Financial risk can arise due to fluctuation in exchange rate and change in term structure of interest rate. Financial risk is linked with uncertainty about future changes in exchange rate and change in term structure of interest rate. Share price refer to price being asked for a single share of company stock. These share prices are believed to react to macroeconomic factors as investigated by Chen, et al. (1986). According to asset pricing literature, instability means fluctuations in asset pricing. Different techniques have been used to measure the effect of volatility. Standard deviation measures daily changes in asset prices or it can also be measured by an econometric volatility model as a byproduct of its estimation. Changes in financial risk affect the stock return of firms. So, exchange rate and interest rate exposure in Asia stock markets are examined carefully. Stock returns of companies possessing similar characteristics may be different from the other companies.

1.1. Theoretical Background

The **arbitrage pricing theory** is proposed by Roll and Ross (1976). The APT is an asset valuation model which stated that stock returns are affected by "n" factors. But this theory didn't identify name and number of factors. However, these factors can be company specific, industry specific, behavioral factor and statistical in nature. The two concepts have been discussed under arbitrage pricing theory.

- The return generation is stochastic process of n-factors. These n-factors are systematic i.e. their effect can be reduced but cannot be eliminated.
- The second concept is arbitrage principle. In perfect capital market, two assets having equal risk will have same return and will be sold at same price and investor will earn normal profit. If these assets are sold at different prices due to information gap then investor will earn an arbitrage profit i.e. riskless profit without assuming any risk.
- The arbitrage pricing theory is based on following assumptions
- Investor always wants to maximize their wealth.
- The borrowing and lending will be at risk free rate.
- There is no taxes and transaction cost.

Kumar (2013) signalize that arbitrage pricing theory has been studied under two approaches. The first approach is the factor loading approach derived by Roll and Ross (1976), in which statistical analysis technique has been used to separate those factor from stock returns that cannot be observed and then test pricing mechanism. The second approach is macroeconomic model or equilibrium model which assume that stock return can be affected by a wide range economics factors. The industry structure vary from country to country, firm foreign exposure also vary from country to country depending on foreign and domestic demand function. International firms reduce the impact of foreign exposure by using currency derivatives or swaps. The level of competition within industry also determines a significant impact of exchange rate exposure. The exporting firms are also affected by currency exposure due to fact that input raw material has been purchased in home currency while receive output price as foreign currency. When firm move toward maturity stage in international

market, exchange rate exposure also increases. Business groups play their role very well, when capital markets are under developed. The business groups share risk of affiliated firms by facilitating income flows and by reallocating money in between affiliates in times of distress. The risk management is very critical for firm success because risk sharing can help the firms to undertake risky projects and business groups can also absorb shocks in particular sector of economy. In emerging markets there is negative effect of groups on operating profitability. The large groups are more significant in providing insurance opportunities in some countries as compare to small. The intra group loans assist the business group in distress and provide liquidity as well. Therefore within business group income smooth, however there is no marked relationship between the development of capital market and group affiliation.

1.2. Problem Statement

The stock return of firms varies significantly with the changes in financial risk. It leads academics and investors to pay increasing attention to examine exchange rate and interest rate exposure in Asia stock markets. Companies possessing similar characteristics may, in a given month, show returns that are different from the other companies. The arbitrage pricing model gives us a systematic way of describing how expected security returns must relate to their co-movement with the economy. Exchange rate uncertainty and interest rate fluctuations influence both multinationals and domestic firms' competitive positions, their input and output price, their supply and demand chains, or their competitor's prices. It also influences exporting and non-exporting firms. Therefore, it is meaningful to have firm level analysis as well as exporting and non-exporting firm's behavior toward on equity returns of non-financial firms.

1.3. Research Questions

1. How financial risks affect stock returns of non-financial firms?
2. Whether there exists a difference between behavior of stock returns of exporting and non-exporting firm?
3. Do multinational firm and domestic firms depict same behavior in term of firm level return and industry return?
4. How the stock returns of firms vary with group affiliation?

1.4. Significance and Contribution

Life of every single person is affected by fluctuations in exchange rate and interest rate. Interest rate risk arises due to change in interest rate. The relationship between interest rate and stock price return is inversely related. Exchange rate movements influence directly or indirectly many decisions of the domestic as well as international firms. Therefore, study of movement of exchange rate is central for survival in international markets. This study is focused on financial risk and its impact on firm through different dimensions. These are discussed below:

- **Firm Level Analysis:** This study focus on industry level and firm level by explaining inter temporal linkage of equity returns and fluctuating interest rate and exchange rate. Industry analysis is important because

market aggregation may hide significant differences among industries in terms of fluctuation exchange rate and interest rate sensitivity.

- **Domestic Firms and Multinational Firm Behavior:** All major decisions of international firms depend upon exchange rate and interest rate movements. This study explains the dynamics of domestic and multinational firms.
- **Exporting and Non-Exporting Behavior:** For purchase of raw materials and sale of finished goods, firms interact with international markets. Purchase of raw materials is carried out from a country whose currency is expected to depreciate against home currency likewise finished goods are sold to a country whose currency is expected to appreciate against home currency. So depending upon exchange rate and interest rate of trading partners, firms select markets for import of the raw material required as well as markets for the export of finished products.

2. LITERATURE REVIEW

The role of stock market in any economy is very critical, they help in movement of surplus fund from saver to investor thus they strengthen the economic growth and help in development of country. The risk exposure of corporation has been investigated by many researchers. There exists inverse relationship between financial risk and equity returns (Jorion 1990, Bartov and Bondar 1994). Macroeconomic variables and stock return are related to each other. This relationship has gained much attention since the publication of Chen, Roll and Ross (1986) seminal work. Many empirical studies have been conducted to study the relationship between stock return and macroeconomic variables. These studies report that theory has been silent in identifying the macroeconomic variables which influence stock returns (Chen, et al. 1986). Variable identification and empirical analysis in these researches is based on financial theory, economic rational and intuition of investor. Equity returns usually react to economic news as well as many other macroeconomics variables. Chen, et al. (1986) was first who used arbitrage pricing model to study equity returns. According to Chen, et al. (1986) the stochastic process of generating return is linear function of n-factors. These macroeconomic variables include industrial production, inflation, risk premia, the term structure, market indices, consumption and oil prices. Monthly data is used to capture the effect. To estimate and test risk premium on macroeconomic variables a multivariate form of Fama and McBeth (1973) approach is adopted. This study conclude that stocks returns react sensitively to economic news particularly unanticipated news. It further reports that news can be an innovation in the variables which can be identified by using intuition and financial theory. Pantzalis, Simkins and Laux (2001) investigate foreign exchange sensitivity of the 220 multinational firms for the period of 1989-93 in the Fortune 500. It extend the previous studies relates to multinational firms exposure to exchange rate risk and report that unexpected changes in exchange rates effect value of firms. In order to respond to these changes multinational firms can manage their operating exposure by diversification. Multinational firms with diversified operation in large number of regions can effectively construct operational hedges. Pantzalis, et al. (2001) use breadth (i.e.

number of countries having subsidiaries of firms) and depth (concentration in network) variables as a proxy of operational hedges where as foreign subsidiary is being used as a proxy of financial hedge. The control variables being used are measured by total assets natural log, foreign involvement by use of proxy of foreign sales ratio, total risk by using logarithmic form firm average prices and industrial diversification measured by no of foreign subsidiaries. The basic tool to measure currency exposure was time series regression equation for each stock:

$$R_{it} = \alpha + \beta R_{mt} + \gamma R_{ct} + \varepsilon_{i,t}$$

Pritamani, et al. (2004) investigates effect of domestic and foreign market on value of firm. Data has been collected from exporting firms, importing firms and domestic firms from the sample of S&P 500 firms. Exporting firms are that have 50 % of foreign sales or total assets located overseas. Importing firms are those that import a part of sales. Domestic firms are those having major part of sales from domestic operation and little involvement in foreign competition. Financial institutions and oil firms are excluded from analysis due to their insensitivity to fluctuation in dollar. Stock return data is obtained from equally weighted portfolios of exporting and importing firms. Univariate regression analysis has been done at the portfolio and firm level. Research report is suggestive of insignificant exposure for exporting firms but significant positive exposure for importing firms. Jorion (1990) investigate exposure of U.S multinational firms to foreign currency risk. It also focuses on determinants of exchange rate exposure. There exist direct relationship between foreign involvement and exchange rate. All other being constant, unanticipated appreciations in foreign currency leads to increased profits and hence increase value of firm. It has been found that most of multinationals firms with foreign involvement belong to oil industry where foreign sales accounts for 53 % of sales of U.S oil industry and 41 % sales belong to computer industry. Due to oil firms's insensitivity to fluctuations in dollars these firms has been excluded from the analysis. Thus direct relationship has been observed between financial risk and foreign sales. Hassan and Nasir (2008) explore causal relationship of macroeconomic variables and equity return during period of 1998-2008. Monthly data has been used. The study investigated relationship among industrial production, broad money, exchange rate, narrow money, consumer price index, oil prices, t-bill rate with equity returns. The technique is used in the study is auto regressive distributed lag (ARDL) to study Pakistani equity market. The long term effect of interest rate, money supply and exchange rate on equity return is found significant. The negative relationship between interest rate and equity return is statistically significant. This implies that interest rate increase is linked with increased discount rate and consequently which lead to decrease in present value of expected cash flows and share price is present value of expected cash flows. There is positive relationship between money supply and equity return which implies that increased money supply leads to increased liquidity and hence value of share increases. Kalyanaraman and Tuwajri (2014) also explore the long run dynamics of macroeconomics variables and global stock prices. Monthly data for the period of 1994-2013 has been used for the

analysis. The study employed Johansen co-integration approach to investigate the long term effect of macroeconomic variables on stock prices. The analysis shows that except S&P 500 index all other variables are statically significant in explaining stock price behavior. The industrial production, money supply, exchange rate, and oil prices are positively related to stock prices. Thus help in explaining variation in stock prices. Smithson and Simkins (2005) suggest changing interest rate have adverse effect on financial firm's stock returns. These results are consistent with findings of Flannery and James (1984), that interest rate changes has significant effect on stock return of commercial banks. These returns are highly correlated with changes in interest rate. In case of saving and loan associations, results are consistent with commercial bank. Stock return is significantly negatively correlated with interest rate. But this effect of interest rate on saving and loan association is more than commercial banks. The stock returns of companies operate in industrial sector with insignificant cross border revenues are not much affected by changes in exchange rates. These results are consistent with finding of Pantazalis, et al. (2001) suggest that firms with increases level of foreign sales, currency exposure also increases. This exposure is significant and also contributed to total risk of the firm. Multinational firms with concentrated foreign subsidiaries are more sensitive to currency exposure than the other firms. It conclude that operational hedges tools used by firms are effective for reduction of foreign exchange rate risk exposure. Flannery and James (1984) examine the relationship between interest rate sensitivity and stock returns. Research considers two components as a function of common stock returns. These are nominal assets returns and physical assets returns. The return generating processes is studied by employing two index models of stone (1974). Nominal assets generate fixed cash flows where as real or physical assets generated fluctuating cash flows as price level fluctuate. Weekly return for the period 1976-1981 has been obtained from the security price file for 67 commercial banks and saving and loan associations. To check the presence of autocorrelation upto 15 lags for each series is tested. Result indicates that significant impact of fluctuating interest rate on value of commercial banks. These returns are highly correlated with changes in interest rate. In case of saving and loan associations, results are consistent with commercial bank. Stock returns are significantly correlated with interest rate. But this effect of interest rate on saving and loan association is more than commercial banks. Chow and Chen (1998) explore determinants of foreign exchange rate in Japan. An equity return of Japanese firm is inversely related to their currency depreciation. The currency depreciation effects on industries with high imports ratios are adverse. At the same time levered firms and firms with high cash paying dividends are more exposed to exposure as compare to others. The author argues that the exposure of exchange rate is determined by two factors. These are market conditions and level of competition. When exchange rate fluctuations change stock prices, then level of competition also changes. This lead to change in input prices and hence value of underlying assets also changes. Market aggregation may hide significant differences among industries in terms of risk associated with changing interest rate and exchange rate. Therefore effect of these

fluctuations varies with industry conditions. Papaioannou (2006) discuss effect of exchange rate movements on performance of firm and valuation of assets. Whenever companies operations are diversified in international market then currency hedging become an important tool to address the risk related to movement in exchange rate. Currency risk management department is usual managed by corporate treasury officer. Multinational companies manage their risk by a group of specialized professionals in the shape of risk committee. Their firm keep themselves in investigation for managing firm exposure to risk and techniques used to deal with those risks. Foreign investors are exposed to risk related to foreign currency i.e. translation risk. Their firms usually use value at risk for identification of risk exposure. Multinational firms also use financial derivatives for management of exchange rate risk. The use of currency derivatives increases as sales of non-financial firms increase, this lead to decrease in transaction cost of firm for risk management. Currency forward and over the counter currency options are widely used tool around the world for exchange rate risk management. The prime object of firm using currency derivatives is to minimize the fluctuations in exchange rate and outflow of cash while maximizing their return. Hamao (1988) by following Chen, Ross and Roll (1986) investigate multifactor model in Japanese equity market. It use macroeconomic factors in the mode i.e. Industrial production, inflation, exchange rate, interest rate, investor confidence and oil prices. They used unbalance panel pool to study stock returns in Asian market. Result shows that there is significant impact of inflation, risk premium and interest rate on Asian stock returns. The study concludes that as economic structure changes, impact of these variables also vary depending on economic conditions of the country. Ferson and Harvey (1993) investigate multifactor asset pricing model for expected returns and returns of equity markets. Studies shows that return generation is stochastic process of k-factor and market beta alone does not explain any significant variation in returns. The results suggest that to study cross-culture differences, multiple beta models are used. Many international markets are not fully integrated. Ikeda (1991) examine effect of foreign exchange risk in international market by employing multifactor model of arbitrage pricing theory. Research shows that foreign exchange risk can be diversified when an investor invest in different currencies. In addition to this previous work of Solnik (1977), Adler and Simon (1986), and Stulz (1981) conclude that foreign exchange risk can be minimized by diversification. Hao & Zhang (2007) examine that firm profitability affect stock return. Return on equity is used as a proxy of profitability. The correlation analysis indicates that significant positive correlation with firm size and negative correlation with leverage and book to market ratio. According to study conducted by Khanna and Yafeh (2007), common assumption is that business groups share risk of affiliated firms by facilitating income flows & by reallocating money in between affiliates in times of distress. The risk management is very critical for firm success because risk sharing can help the firms to undertake risky projects & business groups can also absorb shocks in particular sector of economy. Business groups play their role very well, when capital markets are under developed. Statistical tests are conducted to compare the standard deviation of operating

income & profitability between group affiliated and non group affiliated corporations. Asdrubali Sorensen Yosha Method is applied on dividend data to measure group risk sharing. In emerging markets there is negative effect of groups on operating profitability. Conditional variance of profitability result shows that out of seven countries which are examined, risk sharing is significant in four countries. According to Chow, Lee, and Solt (1997) expect cash flows of firms operated in international markets are affected by stock return fluctuations. Value of firms is also affected by fluctuation in exchange rate. Sample size contains 213 firms operated in international market during the period 1977 to 1985. Effect of exchange rate can be due to transaction exposure, translation exposure and economic exposure. Transaction exposure arises due to imports and exports, translation risk is linked with variation in exchange rate and economic exposure is severe form of transaction risk. Fluctuations in exchange rate are linked with economic exposure or transaction exposure. Chow, et al.(1997) investigate both short run and long run impact of fluctuating exchange rate on value of firm. The transaction risk management is usually used by the firms to hedge the home currency against transaction in foreign currency. Economic exposure manage the loss arises from the cash outflow and inflow. Results indicate that foreign involvement doesn't account for cross culture differences. The exposure of exchange rate varies with the size of firm. The study concludes that effect of exchange rate changes can be negative or positive on value of firm. As size of firm increases, exposure also increases suggesting significant positive relationship. A study conducted by Scott and Peterson (1986) changes in interest rate can effect value of financials firms. The magnitude of this effect is linked with firm ability to hedge themselves against these fluctuations. It explores how fluctuations in interest rate effect equity returns of commercial banks, saving and loan associations and insurance firms. The author use approach developed by Flannery and James (1982) and extends the period of research 1977-1984. The ability of insurance companies to hedge against interest rate risk is more efficient as compare to other financial firms. Firm mitigate the risk of long run liability with fixed assets where as commercial banks mitigate exposure of current liabilities with current assets, and saving and loan associations mitigate fixed asset with current liabilities. The author investigate impact of Treasury bill on value of financial institutions by employing percentage change in t-bill because of more explanatory power as compare to ARIMA models. Martin, Madura and Akhigbe (1999) investigate exposure of multinational corporations toward risk associated with exchange rate fluctuations. The contribution of their study was different from the previous studies done by Jorion (1990), Chow et al. (1997) and Bartov and Bodnar (1994). They emphasize on operational hedges as a determinant of exchange rate. The appreciation of foreign currency leads to increase in profit of multinational firms due to fact that the price of domestic goods decreases. On the other hand cost will increase with appreciation of foreign currency as foreign input and debit in foreign currency make it expensive for multinationals. The extent of foreign exposure is directly linked with intensity of financial exposure. The emphasis of study is on European market therefore European market are more exposed toward exposure. The sample size

includes 168 multinational firms that have subsidiaries in Europe. The currency fluctuations in euro as compare to dollar are significantly different. The exposure of multinational also vary with business region, due to regional changes in exchange rate. All those firms are included in sample that has four year data in S&P database and are exposed to European exposure. This requires the firms to have at least 10% foreign sales. In order to identify the magnitude of exposure betas of stock returns are regressed against changes in exchange rate. Result of exposure shows that only 16% of multinational firms have significant exposure where as Jorion (1990) reported only 5% multinational corporation exhibits exposure. The effect of exchange rate fluctuations on stock returns can be negative or positive. Issahaku, Ustarz, and Domanban (2013) investigate relation between macroeconomic variables and stock returns. The study discuss that in nation's economic development, the role of long term capital is very significant. The mobilization of domestic as well as international capital requires a highly organized capital market. Capital is a significant restriction in economic development of many developing nations. In order to minimize the effect of this capital constraint, countries are utilizing stock exchanges to raise long term capital for firms. The greater the stock market is organized, the more it will facilitate economic activities in the country. Stock markets serve their mediator role by channelizing savings into useful investments. Stock market also facilitates reallocation of funds between different sectors and corporations. After the financial integration of 1980 & 1990, the flow of capital to developing countries is significantly increased. So is the case with Ghana which is among the top recipients of Foreign Direct Investment, as per reports of 2011 & 2012. Many studies are conducted to understand the relation between macroeconomic variables and stock returns. This study is conducted to investigate whether a causal relationship is present between macroeconomic variables and stock returns in Ghana. These findings are suggestive of the fact that arbitrage profit opportunities are existent in Ghana stock market. This finding contradicts the Efficient Market Hypothesis. Current and potential investors should focus on money supply, inflation and FDI, because of their long run effects on stock performance. For short term purposes, investors should keep a constant watch on interest rate, inflation and money supply. Keeping in view the impact on inflation and exchange rates on stock performance, the policies regarding Inflation and exchange rate should be designed in a manner to facilitate development of capital market. Bartov, Bodnar and Kaul (1996) investigate the affect of increased exchange rate on multinational corporations operated in US. The study contributes in body of knowledge first by examining affect of increased exchange rate on stock return instead of changing exchange rate and second by decomposing this into systematic risk i.e. the risk that cannot be diversifiable and diversifiable risk i.e. unsystematic risk which can be reduced. Systematic risk is based on macroeconomic factors and is undiversifiable. Unsystematic risk is based on microeconomic variables i.e. company specific and is diversifiable. Multinational corporations have sizeable profits and their net assets are usually subject to foreign currency, therefore any variation in exchange rate increase market beta (as compare to domestic firm) thus lead to

systematic risk and hence cost of equity for multinational corporations increases. The use of market model predict that stock return vary due to systematic risk as reflected in market risk (beta) and this market risk is linked with asset risk instead of financial risk. Therefore when volatility in stock return increases, investor demand additional return for this increased risk as their cost of capital also increased. The exchange rate fluctuations have direct impact on multinational firms as these have foreign subsidiaries and face direct competition in international market. According to asset pricing literature, asset risk is divided into two main components. The first component is systematic risk cannot be eliminated and is due to macroeconomic factors. The second component is diversifiable risk also called unsystematic risk based on microeconomic factors. In well diversified portfolio firms left with only systematic risk. When systematic risk increases the required rate of return also increases and as a result cost of equity will rise. Bartov, et al(1996) discuss that during floating exchange rate regime foreign currency deposits hold by US investor have systematic risk therefore firms operated in international market have significant assets and profit in different currencies and hence impact of market risk is high for those multinational firms. The result concludes that as fluctuation in exchange rate increase, uncertainty in macroeconomic variables also increases leads to increase in volatility of stock returns for all firms. The direct relationship has been observed between stock return of multinational firms and fluctuating exchange rate. Results for portfolio return also suggest a positive relationship between market risk and exchange rate for multinational firms. While examining leverage impact, the study report that asset risk does not contribute toward market risk of multinational firms during floating exchange rate regime nor this increase is due to leverage. As during floating exchange rate leverage increases for all domestic as well multinational firms. The study conclude that increased fluctuation in exchange rate increase market risk significantly for multinational firms only while this effect is insignificant for domestic firms. Nader and Alraimony (2012) argue that economy of any nation is very much dependant on its stock markets. Therefore channelize makes not only the domestic savings but also foreign capital into useful investment. Thus playing a very significant role in capital formation and economic development. Financial intermediation is considered to play a pivotal role in this process of channelization of savings into productive investment. So the financial intermediaries have marked influence on economic growth and development. Stock market stability and stock returns depend upon macroeconomic variables. Early studies which are carried out to study the relation between macroeconomic variables and asset pricing model revealed that there is significant impact of macroeconomic variables on financial assets. Different studies are conducted to analyze this relationship. Fama and Schwert (1977) conduct a study on USA stock market and revealed that stock market volatility is directly related to volatility of macroeconomic variables. The study concludes that inflation is indirectly proportional to stock returns. Aspreem (1989) in his study on European countries report a positive link among macroeconomic variables and equity prices. Joseph (2002) investigates the effect of interest rate as well as exchange rate fluctuations on the

U.K market. The study use data from 276 firms for the period of 1988-2000. The author reports an inverse relation between industry stock return and interest rate. The results suggest that only 34% firm's shows significant exposure for interest rate changes and 28% firms for exchange rate changes. The financial performance of the firms has been affected by the fluctuations in financial risk. Chang (2002) explore effect of exchange rate changes on industry level by using stock returns of Taiwan. The firms are less exposed to exchanges rate risk exposure as compare to smaller firms. These findings are in line with the findings of Chow, Lee and Solt (1997). Amihud (2002) investigate exchange exposure US exporting firm's stock returns. The study concludes that no significant exchange rate exposure has been observed for US exporting firms. Donnelly and Sheehy (1996) investigate financial risk exposure for UK firms engage in exports and report that significant financial risk exposure of UK firms. The autocorrelation problem, conflict of normal distribution and model specification error does not exist. There is positive relationship between money supply and equity return which implies that increased money supply leads to increased liquidity and hence value of share increases. The author finds that this impact is more adverse for large exporting firms as compare to small. The relationship between interest rate and stock returns of Turkish firms is negative. This effect is significant in short run. Abugri (2008) examine that fluctuations in interest rate negatively affects stock returns in Chile, Brazil and Argentina and this affect is significant whereas insignificant relationship between interest rate changes and Mexican stock return has been observed. Jecheche (2011) examine arbitrage pricing theory in Zimbabwe stock market by employing time series data for the period of 1980 to 2005. The study use co integrating technique and vector autoregressive model. The weekly data for the period of 1999-2006 has been analyzed. The Granger causality test has been used to check the lead and lag relationship. The test suggests that stock price leads foreign exchange rate and a non-linear causality has been observed from foreign exchange rate toward stock returns. The study observed unidirectional relation of CPI to stock return both in long run and short run. Therefore predictions for exchange rate are important so that stock return can also be predicted. Mohammad, Husain and Ali (2009) observe the correlation between macroeconomics factors and KSE stock market. The quarterly data has been employed for the period of 10 years. Therefore exchange rate and interest rate exposure are examined carefully. Stock returns of companies possessing similar characteristics may be different from the other companies. The difference in pattern of stock returns shows up as the factor relation. The arbitrage pricing model explains the relation of expected security returns and their co-movement with the economy. Exchange rate uncertainty and interest rate fluctuations affect input and output prices, supply and demand equilibrium, prices of competitors' as well competitive position in international market of multinationals as well as of domestic firms. It also affects exporting and non-exporting firms. Quadir (2012) test arbitrage pricing theory in Dhaka stock market. The author examines effect of macroeconomic variables on stock returns for the period of 1997 -2005. Macroeconomic factors include change in consumer price index, industrial

production, money supply growth rate, exchange rate change, oil price growth rate, interest rate and equity returns. The author use stock portfolios instead of single stock. The result predict that financial risk and stock market return influence returns of the portfolio while significant result has been observed for three portfolios. The results of industrial production, oil prices and money supply do not have any significant influence on returns. The result also predicts that macroeconomic variables have significant influence on Dhaka stock returns. Fama and Schwert (1977) conclude that stock split leads toward significant abnormal returns by investors. In fact, Arbel and Jaggi (1982) indicate that prior to happening of specific event or arrival of new information leads to significant price changes along with abnormal trading volume. The arbitrage pricing theory also expands to an international level. Solnik (1977) investigate the model developed by Ross (1976) by considering different foreign investors. The author concludes that international asset pricing models (IAPT) requires perfect capital market and e riskless portfolio will be riskless to any foreigner investor and the linear factor approach if applicable in one currency then it must also be applicable in any other chosen currency. Donnelly and Sheehy (1996) explore the relation of financial exposure and monthly portfolio returns of UK exporting firms. The sample size includes 39 exporting firms. The study concludes that there is inverse relation between exchange and UK exporting firms returns. Glaum (2002) investigate German firm's economic exposure and fluctuating exchange rate. The study concludes that exchange rate changes can significantly affect stock returns of German. Joseph (2002) investigate the affect of changing interest rate on UK stock returns for the period 1988-2000. The effect of exchange rate fluctuations on stock returns can be negative or positive. They study conclude that the exchange rate changes are less on multinational firms having balance cash flow (both inflow and outflow) as compare to those that have imbalance cash flow. Therefore management ability to hedge the exposure operationally can lead to reduction in fluctuating exchange rate exposure. The results shows that interest rate changes affect industry returns more negatively than by changes in foreign exchange rate. Samsudheen and Shanmugasundram (2013) examine the sensitivity of corporate firm's value to the fluctuations of foreign exchange rates by using Jorion's (1990) model. The finance theory explains that the foreign exchange rate changes has affect the cash flows of corporate firms and that leads to changes in the value of firms. But empirical studies in the developed countries are failed to find a strong relation between foreign exchange rate changes and value of the firm. This paper analyses the relationship between the foreign exchange rate fluctuations and value of Indian corporate firms. This study employ the ordinary least square regression methodology to estimate the foreign exchange rate exposure of selected samples as against bilateral exchange rate of Indian Rupee against US Dollar for a period of 2010 to 2012. The results indicate that on an average, Indian firms benefit from an appreciation of the home currency and may lose from a depreciation of home currency. Hassan and Javed (2009) explore causal relationship of monetary factors and equity return during period of 1998-2008. Monthly data has been used. The

study investigates relationship among money supply, CPI, exchange rate and T-bill, with equity returns. The technique use in the study is Johansen con integration and granger causality. The autocorrelation problem, conflict of normal distribution and model specification error does not exist. The result suggests that there is long run link among monetary variables and equity returns. Insignificant relationship has been observed for the inflation on stock returns. The negative correlation between interest rate and stock return is statistically significant. This implies that interest rate increase is linked with increased discount rate and consequently which lead to decline in present value of future cash flows. Policymakers should keenly observe and careful while designing strategies related to monetary. The authors conclude that monetary factors have both a long-run as well as short run linkage with equity market returns. Bodnar and Wong (2003) examine impact of fluctuating exchange rate on U.S firms. The study focus on investigating exposure impact on firm level. The investigation of exposures at firm level is an important. The exposure of exchange rate varies with the size of firm. The study concludes that effect of exchange rate changes can be negative or positive on value of firm. As size of firm increases, exposure also increases suggesting significant positive relationship. The cross culture differences can be determined by firm size.

3. METHODOLOGY

3.1. Data Description

3.1.1 Population and Sample

The population of this research is companies listed on the Karachi Stock Exchange of Pakistan. The sample size is 115 firms listed in Karachi stock exchange. Only non-financial sectors are selected as financial sector firms have different financial structure.

3.1.2 Data Collection

The data used in the empirical analysis is mainly secondary data collected from State bank of Pakistan published report balance sheet analysis of joint stock companies listed at Karachi Stock Exchange of Pakistan for the period 2003 to 2012. Data on Treasury bill rates and exchange rates is collected from various statistical bulletin issued by State Bank of Pakistan. Stock prices data is taken from Karachi Stock Exchange (KSE) and Business recorder.

3.1.3 Data Analysis Techniques

This study employs multivariate regression analysis to explore the dependence of returns of firm on interest rate, foreign exchange rate, total risk, profitability, foreign exposure, firm size, growth rate, exporting and non-exporting firms, group affiliated and non-group affiliated firms.

3.2 Dependent Variable

3.2.1 Stock Return of Firm

Stock returns of firm can be calculated by using following equation

$$R_t = \ln(P_t/P_{t-1})$$

Where R_t is return for month t , P_t and P_{t-1} are closing values for KSE index companies for month t and $t-1$ respectively (Hassan and Javed,2009).

3.3 Independent Variable:

3.3.1 Foreign Exchange Rate

The change in the foreign exchange rate is measured by employing the end-of-month US \$/Rs exchange rate (Hassan and Javed,2009) and the change in value is worked out through log differencing, i.e.,

$$\text{Change in Foreign Exchange Rate} = \ln(FER_t / FER_{t-1})$$

Where FER is the Foreign Exchange Rate US \$/Rs

3.3.2 Interest Rate

Treasury bill rates are used as a proxy for the interest rate. Change is measured by log difference to T bill rates (Hassan and Javed,2009).

$$\text{Change in the Interest Rate} = \ln(TB_t / TB_{t-1})$$

3.3.3 Foreign Exposure

Large diversified firms face lower sunk costs when shifting production or sales between countries because these are more likely to have established operations in these countries. The implication is that MNCs with large diversified networks will be more successful in effectively managing operating exposure.

$$\text{Foreign exposure} = \text{Exports} / \text{Total sales}$$

3.3.4 Firm Size

The natural log of the market capitalization in the analysis is used as an indicator of firm size.

$$\text{Size} = \text{Natural log of Market Capitalization}$$

3.3.5 Total Risk

The total risk measured by the logarithm of the high to low stock price in order to investigate whether foreign exchange exposure is a significant part of the firm's overall risk (Pantzalis, Simkins and Laux,2001).

$$\text{Total Risk} = \text{Natural log of ratio of firm high and low prices}$$

3.3.6 Growth Rate

The use of growth rates is one of the simplest methods of estimating future growth. However, historically high growth rates don't always mean a high rate of growth looking into the future, because industrial and economic conditions change constantly.

$$\text{Growth Rate} = (\text{Total Assets}_t - \text{Total Assets}_{t-1}) / \text{Total Assets}_{t-1}$$

3.3.6 Profitability

Return on Asset is used as a proxy for the profitability and is calculated by dividing a earnings after tax by its total assets.

Profitability=Earnings after tax /total assets

3.3.7 Dummy Variables

3.3.7.1 Multinational firm and domestic firms: represents a dummy variable and takes the value of '1' when firms operate at international level.

3.3.7.2 Group affiliation or non group affiliation: represents a dummy variable and takes the value of '1' when a diversified firm shows business group affiliation in the case of Pakistan.

3.3.7.3 Market Diversification: represents a dummy variable and takes the value of '1' when firm operations are diversified.

3.4 Econometric Model

Financial analysts and industry practitioners need an asset pricing model to identify the indicators which shows major influence on the asset returns. The arbitrage pricing theory considered being a proficient model in influencing asset returns through multiple factors support this study to examine the macroeconomic risk factors that affect the stock returns of non-financial firms. The theoretical model dealing with multiple factors to estimate stock return behavior is called arbitrage pricing theory developed by Ross (1976). The sensitivity coefficients of macroeconomic risk variables identified as exchange rate and interest rate. Thus, the commonly estimated exposure model looks like:

$$R_i = \beta_{0i} + \beta_1 ER + \beta_2 IR + \mu_{i,t} \quad (I)$$

$$R_i = \beta_{0i} + \beta_1 ER + \beta_2 IR + \beta_3 \sum Z_i + \beta_4 D_i + \mu_{i,t} \quad (II)$$

Where

R_i is the industry return and stock return for firm i.

XR is the foreign exchange rate.

IR is interest rate.

Z_i is control variables.

D_i is Dummy variables.

β_{0i} is common y-intercept.

$\beta_1 - \beta_4$ is coefficients of the concerned variables.

μ_{it} is error term of firm i at time t.

3.4.1 Model for Industry Level Analysis

The study includes thirteen sectors. These sectors are pharma and biotech, engineering electricity, chemical, oil and gas, cement, automobile, miscellaneous and paper, sugar, textile, food, and household sectors. Industry returns are used as dependent variables. These returns are calculated by using industry averages for each year. First of all sector wise firms are being separated then their average is taken for each year to obtain industry average for each

year. In order to check the industry effects the model is as follows:

Industry Effect

$$R_i = \beta_{0i} + \beta_1 ER + \beta_2 IR + \beta_3 FE + \beta_4 FS + \beta_5 PF + \beta_6 GR + \beta_7 TR + \mu_{i,t} \quad (III)$$

Where

R_i is the industry return

ER is exchange rate.

IR is interest rate.

FE is foreign exposure.

FS is firm size.

PF is Profitability.

GR is growth rate.

TR is total risk.

β_{0i} is common y-intercept.

$\beta_1 - \beta_7$ is coefficients of the concerned variables.

μ_{it} is error term of firm i at time t.

3.4.2 Model for Firm Level Analysis

• Firm Level Monthly Returns

$$R_i = \beta_{0i} + \beta_1 ER + \beta_2 IR + \mu_{i,t} \quad (IV)$$

Where

R_i is the firm monthly stock returns

ER is exchange rate.

IR is interest rate.

β_{0i} is common y-intercept.

$\beta_1 - \beta_2$ is coefficients of the concerned variables.

μ_i is error term of firm i at time t

• Firm Level Annual Returns

$$R_i = \beta_{0i} + \beta_1 ER + \beta_2 IR + \beta_3 FE + \beta_4 FS + \beta_5 PF + \beta_6 GR + \beta_7 TR + \mu_{i,t} \quad (V)$$

Where

R_i is the return of the firm i

ER is exchange rate.

IR is interest rate.

FE is foreign exposure.

FS is firm size.

PF is Profitability.

GR is growth rate.

TR is total risk.

β_{0i} is common y-intercept.

β_1 - β_7 is coefficients of the concerned variables.

μ_{it} is error term of firm i at time t.

• Firm Level Annual Returns with Dummies

$$R_i = \beta_{0i} + \beta_1 ER + \beta_2 IR + \beta_3 FE + \beta_4 FS + \beta_5 PF + \beta_6 GR + \beta_7 TR + \beta_8 MNC_i + \beta_9 MD_i + \beta_{10} TR * MNC_i + \beta_{11} TRGA_i + \mu_{i,t} \quad (VI)$$

Where

R_i is stock return for firm i.

ER is exchange rate.

IR is interest rate.

FE is foreign exposure.

FS is firm size.

PF is Profitability.

GR is growth rate.

TR is total risk.

MNC_i is Dummy variables for multinational firm.

MD_i is Dummy variables for market diversification.

$TR * MNC_i$ is interaction term for total risk and multinational firm.

$TR * GA_i$ is interaction term for total risk and group affiliation

β_{0i} is common y-intercept.

β_1 - β_{11} is coefficients of the concerned variables.

μ_{it} is error term of firm i at time t.

3.4.1 Model for Market Returns

$$R_m = \beta_{0i} + \beta_1 ER + \beta_2 IR + \mu_{i,t} \quad (VII)$$

Where

R_m is return of KSE

ER is exchange rate.

IR is interest rate.

β_{0i} is common y-intercept.

β_1 - β_2 is coefficients of the concerned variables.

μ_{it} is error term of firm i at time t.

• Model For Returns of exporting and Non-Exporting Firms

$$R_i = \beta_{0i} + \beta_1 ER + \beta_2 IR + \beta_3 FE + \beta_4 FS + \beta_5 PF + \beta_6 GR + \beta_7 TR + \mu_{i,t} \quad (VIII)$$

Where

R_i is the return of the firm i

ER is exchange rate.

IR is interest rate.

FE is foreign exposure.

FS is firm size.

PF is Profitability.

GR is growth rate.

TR is total risk.

β_{0i} is common y-intercept.

β_1 - β_7 is coefficients of the concerned variables.

μ_{it} is error term of firm i at time t

• Model For Returns of exporting and Non-Exporting Firms with Dummies

$$R_i = \beta_{0i} + \beta_1 ER + \beta_2 IR + \beta_3 FE + \beta_4 FS + \beta_5 PF + \beta_6 GR + \beta_7 TR + \beta_8 TR * MNC_i + \beta_9 FE * GA_i + \mu_{i,t} \quad (IX)$$

Where

R_i is stock return for firm i.

ER is exchange rate.

IR is interest rate.

FE is foreign exposure.

FS is firm size.

PF is Profitability.

GR is growth rate.

TR is total risk.

TR*MNC_i is interaction term for total risk and multinational firm.

FE*GA_i is interaction term for foreign exposure and group affiliation.

β_{0i} is common y-intercept.

β_1 - β_9 is coefficients of the concerned variables.

μ_{it} is error term of firm i at time t

4. RESULTS AND DISCUSSION

This section contains the results of descriptive statistics, correlation matrix and regression analysis.

4.1 Descriptive Statistics

Table 4.1 shows a brief summary of descriptive statistics. The average return of firm in percentage terms are 1.6% with a standard deviation of 53%. The maximum returned of KSE listed firm is 2.13 where as maximum loss is 2.52. The average return in KSE in percentage terms are 2.2% with a standard deviation of 55%. The maximum returned of KSE is 3.87 where as maximum loss is 4.79. The average change in T-bill rate in Pakistan appears to be 4.85% with a standard deviation of 6%. The average change in value of Pakistani currency is 8.6% with a standard deviation of 13.9%. The average foreign exposure face by the KSE listed firms is 11.75% where as maximum foreign exposure is 0.99. The growth rate ranges from 66.55 to -83.7%. The average profit earns by KSE listed firms is 7% with a standard deviation of 11%. The maximum profit during 2003-2012 is 49.60% where as maximum loss is 1.69. The average total risk is 25.52% where as maximum risk is 2.4. The standard deviation for total risk is 36%.

Table-4.1: Descriptive Statistics

	Mean	Maximum	Minimum	Std. Dev.
Return of Market	0.022016	3.874022	-4.790313	0.558814
Returns of firm	0.016641	2.139995	-2.52573	0.532447
Change in Exchange rate	0.086438	0.632228	-0.62861	0.139002
Change in Interest rate	0.048112	0.186202	-0.48548	0.061384
Foreign Exposure	0.117517	0.999755	0.0000	0.236607
Firm Size	21.31223	26.23788	16.10075	1.818913
Growth Rate	0.2404	66.55432	-0.837031	2.011175
Profitability	0.070061	0.496062	-1.691375	0.115962
Total Risk	0.255774	2.456736	0.005036	0.369499

4.2 Correlation Matrix

Table 4.2 shows results of correlation matrix to check presence of multicollinearity. According to results returns of the firms are negatively related to exchange rate growth rate and total risk, where as positively related to T-bill rate,

foreign exposure, firm size and profitability of the firm. The highest positive correlation is 0.12 between return of the firm and profitability where as highest negative correlation is -0.166 which shows that multicollinearity is not present among the selected variables.

Table-4.2: Correlation Matrix

	Returns of Firm	Exchange Rate	T bill Rate	Foreign Exposure	Firm Size	Growth Rate	Total Risk	Profitability
Returns of Firm	1							
Exchange Rate	-0.1664	1						
Interest Rate	0.01632	0.8156	1					
Foreign Exposure	0.0062	0.0704	0.0844	1				
Firm Size	0.0326	0.1365	0.0724	-0.1135	1			
Growth Rate	-0.0071	0.0266	-0.0225	-0.0211	0.0346	1		
Total Risk	-0.0762	0.0638	0.0368	0.1849	-0.0450	0.001	1	
Profitability	0.1200	-0.1083	-0.0964	-0.1576	0.3606	0.0107	-0.078	1

4.3 Unit Root Analysis

Table 4.3 shows results of unit root analysis. The Augmented ducky filler test and Phillip Peron tests are used to test the stationary of the series. The results clearly indicate that series are stationary at level. The Augmented

ducky filler test requires that the error terms to be independent and data should be homoskedastic which might not be true for some cases so PP test is also used which confirms the augmented ducky filler test results. Thus it is concluded that series are stationary at level.

Table-4.3: Unit Root Analysis

	ADF-Level	PP-Level
Returns of firm	-9.94482	-41.66452
Return of Market	-10.06062	-59.68202
Exchange rate	-11.64556	-23.73254
T bill rate	-12.20573	-19.61782
Foreign Exposure	-6.710316	-8.714306
Firm Size	-4.903574	-6.657728
Growth Rate	-33.56711	-33.56906
Total Risk	-2.504597	-22.82193
Profitability	-11.74667	-23.84365
1 % Critic. Value	-3.43603	-3.43603
5 % Critic. Value	-2.86393	-2.86393
10 % Critic. Value	-2.56809	-2.56809

4.4 Regression Analysis

The following tables present the results of regression analysis.

4.4.1.1 Industry Level Analysis

The analysis on an industry basis is important because market aggregation may hide significant differences among industries in terms of interest rate and exchange rate sensitivity. Industry returns are used as dependent variables. These returns are calculated by using industry averages for each year. Table 4.4 shows results of regression analysis for industry returns.

Table-4.4: Dependent Variable- Industry Returns

	Coefficient	t-Statistic	Prob.
C	-0.7132	-1.6537	0.1008
Interest rate	-0.06862	-4.97918	0.0000
Exchange rate	0.011001	3.781961	0.0002
Foreign Exposure	0.087422	0.624077	0.5338
Firm Size	0.026673	1.334954	0.1844
Profitability	0.668374	1.867992	0.0642
Growth Rate	0.219666	1.605788	0.1109
Total Risk	-0.0012	-0.01556	0.9876
AR(1)	-0.28997	-3.23015	0.0016
R Square	0.27682		
Adjusted R Square	0.228608		
F-Statistics	5.741736		
F-Significance	0.000003		
Durbin-Watson stat	2.00619		

The coefficient value for interest rate is -0.068 which is statistical significant. The result shows that negative relationship between interest rate and equity return is statistically significant (Bartov, Bodnar and Kaul, 1996). This implies that interest rate increase is linked with

increased discount rate and consequently which lead to decrease in present value of expected cash flows and share price is present value of expected cash flows. These results are consistent with findings of Smithson and Simkins (2005) and Hassan and Nasir (2008). There exists significant positive relationship between exchange rate and stock returns. These results are in line with the results drawn by Bartov, Bodnar and Kaul (1996) who investigate the affect of increased exchange rate on multinational corporations operated in US and demonstrate that as the volatility in stock returns increases; an exchange rate fluctuation also increases. In addition to this, previous work of Solnik (1977), Adler and Simon (1986), and Stulz (1981) conclude that foreign exchange risk can be minimized by diversification. The value of t-stat for interest rate and exchange rate is also significant and greater than 1.96. The profitability is found significantly positively related to industry return which implies that increased profitability leads to increased industry returns. Hao & Zhang (2007) study reveal that profitability of firm is positively correlated with returns. The relationship of total risk, foreign exposure, firm size and growth rate is found insignificant with industry returns. One of the possible reasons might be that these variables are firm specific; their impact is different for different firms and depending on industry conditions. AR (1) term is also found significant which means that a portion of industry returns are being explained by its own lagged value. For forecasting, the current returns are significant in predicting future industry returns. The Durbin Watson statistics is used to check the presence of autocorrelation. The results indicate no autocorrelation. The R square is coefficient of determination and equal to 27.68% .The value of R square shows that 27.68% variation in industry returns can be explained by T bill rate, exchange rate, foreign exposure, firm size, growth rate, total risk and profitability. The value of F-stat is 5.74 which are statistically significant and show that over all fitness of model.

4.4.2 Firm Level Analysis

Market aggregation may hide significant differences among industries in terms of risk associated with changing interest rate and exchange rate. Therefore effect of these fluctuations varies with industry conditions. Hence firm level analysis is also used.

Table-4.5: Dependent Variable- Monthly Returns of Firm

	Coefficient	t-Statistic	Prob.
C	0.047174	5.757805	0.0000
Exchange rate	0.00933	0.540994	0.5885
Interest rate	-0.00505	-6.64911	0.0000
R Square	0.006813		
Adjusted R Square	0.006669		
F-Statistics	47.32368		
Durbin-Watson stat	2.010916		

Table 4.5 exhibits regression results using firm level monthly returns as dependent variable. The result shows that the insignificant relationship has been observed for

exchange rate and monthly returns of firm. One possible reason of insignificant effect of exchange rate on market returns can be that stock market in Pakistan have limited exposure. The interest rate is negatively related to monthly returns of the firm and this relationship is found significant. Joseph (2002) also report an inverse relation between industry stock return and interest rate. Therefore, increased interest rate is linked with increased discount rate and consequently which lead to decrease in present value of expected cash flows and share price is present value of expected cash flows hence as interest rate increases stock return will decrease (Smithson and Simkins, 2005 and Hassan and Nasir, 2008).

Table-4.6: Dependent Variable – Annual Return of Firm

	Coefficient	t-Statistic	Prob.
C	-0.25294	-1.47333	0.1409
Exchange rate	-0.09138	-11.1052	0.0000
Interest rate	0.015447	8.669514	0.0000
Foreign Exposure	0.073331	1.328109	0.1844
Firm Size	0.005285	0.693636	0.4881
Total Risk	-0.05469	-1.51419	0.1303
Growth Rate	0.006529	0.877043	0.3807
Profitability	0.532326	4.114901	0.0000
AR(1)	-0.24728	-8.4374	0.0000
R Square	0.163918		
Adjusted R Square	0.157893		
F-Statistics	27.20271		
F-Significance	0.0000		
Durbin-Watson Stat	2.032603		

Table 4.6 shows results of regression analysis using firm level stock returns as dependent variable. The coefficient value for interest rate is 0.01544 which is statistical significant. The result shows that positive relationship between interest rate and firm level stock returns (Scott & Peterson, 1986). The value of t-stat for interest rate is also significant and greater than 1.96. The coefficient value for exchange rate is -0.091 which is statistical significant. The result shows that negative relationship between exchange rate and firm level stock returns. These results are consistent with findings of Donnelly and Sheehy (1996) and Glaum (2002). The value of t-stat for exchange rate is also significant and greater than 1.96. The profitability is found significantly positively related to stock a return which implies that increased profitability leads to increased industry returns. Hao & Zhang (2007) report that profitability of firm is positively correlated with returns. The relationship of total risk, foreign exposure, firm size and growth rate is found insignificant with firm level stock returns. One of the possible reasons might be that these variables are firm specific; their impact is different for different firms and depending on firm conditions. AR (1) term is also found

significant which means that a portion of firm level stock returns are being explained by its own lagged value. For forecasting, the current returns are significant in predicting future stock returns. The Durbin Watson statistics is used to check the presence of autocorrelation. The results indicate no autocorrelation. The R square is coefficient of determination and equal to 16.39%. The value of R square shows that 16.39% variation in firm level stock returns can be explained by T bill rate, exchange rate, foreign exposure, firm size, growth rate, total risk and profitability. The value of F-stat is 5.74 which are statistically significant and show that over all fitness of model.

Table-4.7: Dependent Variable – Annual Return of Firm With Interaction Terms

	Coefficient	t-Statistic	Prob.
C	-0.32587	-1.74325	0.0816
Exchange rate	-0.09081	-11.1001	0.0000
Interest rate	0.015113	8.528439	0.0000
Foreign Exposure	-0.08486	-0.95791	0.3383
Firm Size	0.00867	1.002337	0.3164
Total Risk	0.028607	0.611479	0.541
Growth Rate	0.006426	0.866924	0.3862
Profitability	0.527729	4.089019	0.0000
MNC	0.016224	0.434075	0.6643
MD	0.035673	1.179939	0.2383
FE*GA	0.245487	2.266694	0.0236
TR*MNC	-0.18769	-2.28566	0.0225
TR*GA	-0.09184	-1.33017	0.1837
AR(1)	-0.25477	-8.68879	0.0000
R Square	0.175047		
Adjusted R Square	0.165342		
F-Statistics	18.0362		
F-Significance	0.0000		
Durbin-Watson Stat	2.038105		

Table 4.7 shows results of regression analysis for returns of firms. It also incorporate interaction terms. The coefficient of exchange rate is found negative and statistical significant. The negative relationship between exchange rate and firm stock returns are consistent with findings of Donnelly and Sheehy (1996) and Glaum (2002). The coefficient value for interest rate is statistical significant and positive. The result are consistent with the findings drawn by Scott and Peterson (1986). The profitability is found significantly positively related to stock returns which implies that increased profitability leads to increased stock returns. Hao & Zhang (2007) study reveal that profitability of firm is positively correlated with returns. The interaction term for total risk and multinational firms is found significant and negative. This suggest that multinational firm show less exposure toward total risk, as compare to other firms faces a decreases in their returns. The interaction term for foreign exposure and group affiliation is found significant and positive. This implies that firms which are affiliated to specific group, the face significant exposure which has

positive impact on returns of the firms due to their affiliation to a specific group.

Table-4.8: Dependent Variable – Return of KSE

	Coefficient	t-Statistic	Prob.
C	0.410209	3.831533	0.7101
Exchange rate	-0.02762	-5.77565	0.0000
Interest rate	-0.00089	-0.85812	0.391
R Square	0.113833		
Adjusted R Square	0.108255		
F-Statistics	20.40605		
F-Significance	0.0000		
Durbin-Watson Stat	2.05397		

Table 4.8 shows results of regression analysis using return of market as dependent variable. It is clear from the table

4.4.3 Exporting Firms and Non-Exporting Firms

Table-4.9: Dependent Variable – Return of Exporting and non-Exporting Firm

	Coefficient	t-Statistic	Prob.	Coefficient	t-Statistic	Prob.
	Exporting Firms			Non-Exporting Firms		
C	-0.541396	-1.897394	0.0783	-0.08374	-0.35421	0.7233
Exchange rate	-0.100435	-8.436007	0.0000	-0.08481	-7.01564	0.0000
Interest rate	0.019430	7.780466	0.0000	0.012621	4.722623	0.0000
Foreign Exposure	0.035976	0.532452	0.5946	43.92276	1.513136	0.1308
Firm Size	0.011412	0.895429	0.3710	0.002342	0.224764	0.8222
Profitability	0.509775	2.824364	0.0049	0.509572	2.637339	0.0086
Total Risk	-0.064928	-1.213594	0.2255	-0.04955	-0.95435	0.3403
AR(1)	-0.226509	-5.189860	0.0000			
R Square	0.287646			0.101397		
Adjusted R Square	0.256518			0.090755		
F-Statistics	16.86229			12.14533		
F-Significance	0.000000			0.0000		
Durbin-Watson Stat	2.002192			2.066498		

Table 4.9 shows results of regression analysis for returns of exporting and non-exporting firms. It is clear from the table that constant C is insignificant which means that there is no omitted variable case. The coefficient value for interest rate for exporting firms is 0.019 where as for non-exporting firms it is 0.012 and is statistical significant. The result shows that positive relationship between interest rate and firm stock returns (Scott & Peterson, 1986). The coefficient value for exchange rate for exporting firms is -0.100 where as for non-exporting firms it is -0.08 and are statistical significant. The result shows that negative relationship between exchange rate and firm stock returns. These results are consistent with findings of Donnelly and Sheehy (1996), Joseph (2002) and Glaum (2002). The results support the fact that fluctuation in exchange rate influence value of firm. Thus exchange rate has significant influence on stock

returns of firms. The value of t-stat for exchange rate is also significant and greater than 1.96. The profitability is found significantly positively related to stock a return in both cases which implies that increased profitability leads to increased stock returns of firms (Hao & Zhang 2007). The relationship of total risk, foreign exposure, and firm size is found insignificant with firm stock returns. These variables are firm specific so their impact is different for different firms and depending on firm conditions. The Durbin Watson indicates no autocorrelation. The R square for exporting firms is 28.76% whereas for non-exporting firms it is 10.13%. The value of R square shows that exporting firm's stock returns can be better explained by interest rate, exchange rate, foreign exposure, firm size, total risk and profitability as compare to non-exporting firms. The value of F-stat is 16.86 for exporting firms and 12.14 for non-exporting firms which

are statistically significant at 1% level of significance therefore show over all fitness of model. Table 4.10 shows results of regression analysis for returns of exporting and non-exporting firms and included interaction terms as well. The coefficient value for exchange rate for exporting firms is -0.100 where as for non-exporting firms it is -0.09 and are statistical significant. The result shows that negative relationship between exchange rate and firm stock returns. These results are consistent with findings of Donnelly and Sheehy (1996) and Glaum (2002). The coefficient value for interest rate for exporting firms is 0.019 where as for non-exporting firms it is 0.015 and is statistical significant. The result shows that positive relationship between interest rate and firm level stock returns (Scott & Peterson, 1986). The foreign exposure is found significantly positively related to stock a return for non-exporting a firm which implies that

increased foreign exposure of non-exporting firms leads to increased returns of the firms whereas foreign exposure for exporting firms is insignificant. The profitability is found significantly positively related to stock a return in both cases which implies that increased profitability leads to increased industry returns (Hao & Zhang 2007). The interaction term for total risk and multinational firm is found significant and negative. The suggest that multinational firm show less exposure toward total risk, their risk is being diversify as compare to other firm, decreases their returns. The interaction term for foreign exposure and group affiliated firm is found significant and positive. Therefore, firms which are affiliated to specific group, the face significant exposure which has positive impact on returns of the firms due to their affiliation to a specific group.

Table-4.10: Dependent Variable – Return of Exporting and Non-Exporting Firm With Interaction terms

	Coefficient	t-Statistic	Prob.	Coefficient	t-Statistic	Prob.
	Exporting Firms			Non-Exporting Firms		
C	-0.58914	-2.0682	0.0910	-0.32319	-1.01654	0.3098
Exchange rate	-0.10115	-8.56139	0.0000	-0.09226	-6.83184	0.0000
Interest rate	0.019614	7.911233	0.0000	0.01525	5.05598	0.0000
Foreign Exposure	-0.07179	-0.80255	0.4226	71.83536	1.930377	0.054
Firm Size	0.013361	1.053654	0.2925	0.009519	0.635067	0.5256
Profitability	0.494945	2.706621	0.007	0.434582	1.913882	0.0561
Total Risk	-0.0122	-0.19419	0.8461	-0.0364	-0.51606	0.606
AR(1)	-0.2329	-5.33577	0.0000			
TR*MNC	-0.19018	-2.2034	0.028	-0.24038	-1.6631	0.0568
FE*GA	0.178114	1.82458	0.0687			
R Square	0.199209			0.105878		
Adjusted R Square	0.185049			0.090697		
F-Statistics	14.06902			6.974657		
F-Significance	0.0000			0.0000		
Durbin-Watson Stat	2.009001			2.028148		

4.5 CONCLUSION

4.5.1 Industry Level Analysis

The first objective of study is to explain the relationship between financial risk exposure and stock returns of non-financial firms. The industry level analysis shows that statistically significant negative relationship exists between interest rate and stock return. This implies that interest rate increase is linked with increased discount rate and consequently which lead to decrease in present value of expected cash flows and share price is present value of expected cash flows. There exists significant negative relationship between exchange rate and stock returns. The result shows that negative relationship between exchange rate and firm stock returns. These results are consistent with findings of Donnelly and Sheehy (1996), Joseph (2002) and Glaum (2002). The results support the fact that fluctuation in exchange rate influence value of firm. Thus exchange rate has significant influence on stock returns of firms.

4.5.2. Firm Level Analysis

Market aggregation may hide significant differences among industries in terms of risk associated with changing interest rate and exchange rate. Therefore effect of these fluctuations varies with industry conditions. Hence firm level analysis is also done. The firm level analysis is done from different dimensions. First, using monthly returns of firms it has been found that there insignificant relationship between exchange rate and monthly returns of firm. The interest rate is negatively related to monthly returns of the firm and this relationship is found significant. After monthly returns, annual returns of firms are also used for capturing deeper effect. The result shows that positive relationship between interest rate and firm level stock returns whereas negative relationship between exchange rate and firm level stock returns has been observed. The relationship of total risk, foreign exposure, firm size and growth rate is found insignificant with firm level stock returns. The multinational firm show less exposure toward total risk, their risk is being

diversify as compare to other firms. This increases their returns. Whereas the firms which are affiliated to specific group, the face significant exposure which has positive impact on returns of the firms due to their affiliation to a specific group.

4.5.3. Exporting Firms and Non-Exporting Firms Analysis

The second objective of study is to **provide the insight about equity returns behavior of exporting and non-exporting firms in case of changing financial risk.** The result shows that positive relationship between interest rate and firm stock returns and this relation is stronger in exporting firms as compare to other firms operating in same industry. The result shows that negative relationship between exchange rate and firm stock returns and this relation is stronger in exporting firms as compare to other firms operating in same industry. This suggests that management ability to hedge the exposure operationally can lead to reduction in fluctuating exchange rate exposure. Firms with global exposure do better than those with no global exposure. Thus exchange rate has significant influence on stock returns of firms. The foreign exposure is found significantly positively related to stock a return for non-exporting a firm which implies that increased foreign exposure of non-exporting firms leads to increased returns of the firms. The profitability is found significantly positively related to stock a return in both cases which implies that increased profitability leads to increased returns. The third objective of study was to **provide insight about the differences in the behavior of stock returns of multinational firms and domestic firms due to change in financial risk.** The analysis reveals that multinational firm that show less exposure toward total risk, as compare to other firm face decline in returns. Therefore returns of multinational firms are more as compare to domestic firm due to their ability to diversify risk. The forth objective of study was to **study the impact of group affiliation on stock returns in changing dynamics and financial risk.** The firm level analysis reveals that the firms which are affiliated to specific group, the face significant exposure which has positive impact on returns of the firms due to their affiliation to a specific group. Therefore returns of firms which are affiliated to specific group are more as compare to domestic firm due to their ability to diversify risk.

5. RECOMMENDATIONS AND POLICY IMPLICATION

5.1. Recommendations

As financial risk is an important area; certain recommendations can be made in this regard.

1. The study shows that both exchange rate and interest rate have significant effect on return of firms and market and play an important role in foreign market. Therefore state bank of Pakistan and government officials should realize the importance of exchange rate.
2. A decrease (increase) in interest rates causes increase in stock price. Thus interest rates should be increased or decreased under a controlled scheme. If interest rates are to be increased (decreased), it should be done step by step. This is because rapid increase in

interest rates increases the probability of decline in share prices and vice versa.

5.2. Policy Implication

1. The study can help the institutional investor as well as the fund managers, who make the investment, to know about the behaviour of exchange and interest risk and its impact on return. This study is a continuation of existing studies in the context of understanding the relationship of financial risk and firm level returns.
2. Exchange rate and interest rate has an impact on stock market returns therefore the identification of the impact of these variables on stock market behaviour facilitates investors in making effective investment decisions as by estimating expected trends in exchange rates, and interest rate, investors can estimate the future trend of share prices and thus allocate their resources more efficiently.
3. The monetary policy makers should also keep in mind the impact of changes in interest rates on the capital market in the form of a reduction of prices. This study will help the management in decision making as they will be able to know that up to what extent fluctuation in financial risk will impact stock return of the firms.
4. Similarly, investors can make decisions regarding investments that what are the future returns of the company, if there is increase or decrease in level of financial risk.

5.3. Limitations of Research

This study has the following limitations:

1. Due to limited time, this study is only limited to Karachi stock exchange. The reason behind the selection of Karachi stock exchange is the true representative of stock markets in Pakistan. Therefore further research can also be conducted in other emerging markets.
2. The study is limited to period of 2003 to 2012 and for sample of 115 firms it can be extended to longer time frame.

5.4. Further Research Directions

This study provides empirical evidence about weak explanatory power of the traditional asset pricing models and recommends that future studies of asset pricing model should not only on focus on identification of factors that influence returns but also on understanding the time and conditions that affect the performance of models. There are following recommended directions of further research.

1. A comparative study can also be done in other emerging markets to compare the result.
2. Other combinations of price and non price factors can also be explored to test arbitrage pricing model. Other macroeconomic variables such as money supply, inflation and oil prices may also be explored.

As per the knowledge of the researcher, this study is pioneer study in Pakistan as previously firm level analysis has not been done for financial risk and share price behavior. Thus this dissertation is a spatial extension of the previous researches. This research's focus on firm analysis by using two factors model instead of taking the all monetary variables like previous researches.

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