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Macroeconomic Factors and Sectoral Indices: A Study of Karachi Stock Exchange (Pakistan)

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ABSTRACT

The primary purpose of this study is to examine the impact of macroeconomic variables on stock returns by applying multifactor model within an APT frame work. This study consists of five macroeconomic variables Money Supply, Exchange Rate, Industrial Production, Short Term Interest Rate and Oil prices. Nine sectors are selected for the study on the basis of data availability on the Karachi Stock Exchange 100 index. These sectors are Oil and Gas, Textile Composite, Jute, Cement, Cable and electrical Goods, Automobile, Chemical and Pharmaceutical, Leasing and Glass and Ceramics. The closing prices of each firm of each sector are obtained for the period of ten years starting from June 2000- June 2010. Descriptive statistics are performed for the temporal properties of data and Augmented Dickey Fuller (ADF) is employed to check the stationarity of data. Multicollinearity has been tested among independent variables through correlation matrix. Diagnostic results show that data has no econometric problem therefore Ordinary Least Square has been used to analyze the impact of macroeconomic variables on the returns. The result reveals that macro-economic variables have significant impact on the returns of sectors but their contribution to bring variation in their returns is very small. Only Short Term Interest Rate has a significant impact on returns of various sectors where as Exchange Rate and Oil prices have significant impact on specific sectors like and Oil and Gas sector, Automobile and Cable and Electronics. This sectoral study also documents the usefulness of the multifactor model as compared to a single index model.

Key Words: Arbitrage Pricing Theory (APT), Ordinary Least Square (OLS), Augmented Dickey Fuller Test (ADF), Macroeconomic Variables, Sectoral Indices.

1.0 INTRODUCTION

In developed Capital markets there is close association between Macroeconomic forces and stock prices and the literature available on that study since 1970s. The variation in stock prices has been studied by multi beta model named as Arbitrage Pricing Theory (APT).These studies have a focus on developed markets. After 1980s the association between stock prices and macroeconomic forces has been examined in emerging markets. Menike (2006) (as cited by Ali 2011).Emerging stock markets has two characteristics first these are shallow and second these are unstable. These two features of emerging stock markets enforce the macroeconomic forces to play an important role in bullish and bearish trend of stock market. Moreover oversensitivity in stock returns to macroeconomic forces is created by low volume of trade and limited available public information along with shallowness and unstable nature of emerging stock markets.

The emerging markets have been attentively taken by investors over the past decade. It is noticed that the returns in emerging stock markets is greater as compared to the developed markets. Pakistan has also emerging stock market due to shallowness and instability in its stock markets. A crowd of problems stood in the way of Pakistan which destroyed its economic potential since 1947. Many problems aroused in the economic progress of country like Fights among religious sects, outmoded bureaucratic procedure, Custom duties, Counterproductive tax rates and strategic approach of Government kept away Pakistani stock markets from foreign investment.

Every investor wants to get better return on its investment. There are many investment opportunities for investment in a country. Investment in stock market is one of them. The return, when any investor invests in stock market depends on various factors. The precise number of these factors is not known yet. Literature on Capital markets reveals that a large no of factors are involved in the determinant of equity prices. The suggestion available in the literature is, different variables are involved in bringing variation in the stock returns.

Many studies of different researchers are available in the literature about the relationship between macroeconomic variables and stock prices .These studies have a focus on composite index rather than sector index .This study is

different from the other studies in a way that it investigates the impact of macroeconomic forces on sectoral indices. In literature there exist some traces of investigation between macroeconomic factors and returns on specific sectors. Ball and Brown (1980) showed in their study that the behavior of stock prices in mining sector in Australian Stock Market is abnormal. They concluded that the return on mining sector as compared to the other sector is high without earning risk premium.

Faff and Chan (1988) (as cited by Muneer, Zaheer and Rehman 2011) revealed that there is a strong impact of macroeconomic variables on the returns of gold industry. Their multi factor model is comprised of three macroeconomic factors gold rate, exchange rate and interest rate. They concluded that these macroeconomic factors have a strong impact on returns of gold.

In the study five macroeconomic variables are taken Money Supply, Short term interest rate, Industrial production, and Exchange rate and oil prices. These macroeconomic variables have been selected on the basis of literature. The sectors which have been selected in doing research are Jute, Fertilizer, Pharmaceutical, Automobile, Electrical goods an Oil and gas sector, Leasing, Textile Composite and Glass and Ceramics. The study attempts to determine the impact of macroeconomic variables on various sectors listed on Karachi Stock Exchange.

This study is a contribution to the literature by analyzing the impact of macroeconomic factors on various sectors. The results of this study is helpful in determining the behavior of returns of various factors in response to change in macroeconomic forces such as Short Term Interest Rate , Oil Prices, Exchange Rate, Money Supply and Industrial production. Moreover the outcomes of the study are also helpful in designing the economic and financial policy by taking in to account the performance of various sectors in stock market.

This paper is organized in five sections. First section shows the introduction and importance of research. Second section indicates the literature review about the relationship between macroeconomic forces and returns of Stocks. Research Methodology along with hypothesis is presented in section three. Empirical Results and Discussion are narrated in section Four. Section five reveals the Conclusion, Recommendations and future implications of the study.

1.2 Objectives of study

The specific objectives of study are

- To examine the impact of macroeconomic variables on the returns of different sectors listed on Karachi Stock Exchange.
- To know the intensity of macroeconomic variable on the returns of different sectors listed on Karachi Stock Exchange.

2.0 LITERATURE REVIEW

In literature two models have been usually employed in determining the risk return relationship Capital Asset Pricing Model (CAPM) and Arbitrage Pricing Theory (APT).CAPM was developed by Sharpe (1963). It measures the risk return relationship on the basis of single factor. Therefore it is considered as inappropriate model in predicting the risk return relationship. On the other hand APT considers various micro and macro-economic factors in measuring the risk return relationship. APT is based upon the fewer assumptions as compared to CAPM. A lot of studies in literature used APT and CAPM model in demonstrating the relationship between risk factors and returns of the stock. A brief overview of these studies is illustrated below.

Chen et al. (1986) explained the returns of stocks by taking in to account the macroeconomic forces in APT framework. The macroeconomic variables included in his study were spread between long and short interest rates, expected and unexpected inflation, industrial production and the spread between returns on high and low grade bonds. His findings were that these macroeconomic factors had played a significant role in explaining the variability in stock returns.

Chen (1991) modified the APT model by using macroeconomic factors in determining the risk return relationship. The macroeconomic factors used in his study were lagged, the default risk premium, short term interest rates and market dividend price ratio, production growth rate and the term premium for the period 1954 to 1986. His result showed that the returns of the stocks had been dependent upon these macroeconomic factors and these factors were negatively correlated to excess market return.

Pari and Chen (1984) used two macroeconomic factors interest rate and market return over the period of 1975 to 1980 on 2090 firms. Their findings revealed that stock returns had been significantly affected by these macroeconomic factors.

Flannery and Protopapadakis (2002), investigated that macroeconomic factors affect aggregate equity returns or condititional volatility and both. The set of macroeconomic factors included 3 real macroeconomic factors (consumer price index, personal income index and monetary aggregate) and 3 nominal macroeconomic factors (employment report, balance of trade and housing starts). Univariate generalized autoregressive conditional heteroskedasticity GARCH of lagged 1 was applied on daily returns over a period of 1987 to 1996. It was observed that Consumer price index and personal income had been affected the stock returns but only the returns conditional volatility was affected by three real factors (housing starts , balance of trade and employment report) whereas money supply had a significant impact on both returns and conditional volatility.

Ewing (2002) examined how the performance of financial sector affected by shocks in economy. He employed five-equation vector auto regression model to investigate the relationship between returns of stocks and macroeconomic factors. The APT model of the research comprised of four macroeconomic risk factors monetary policy, inflation, real economic activity and market risk. Post 1987 crash period selected up to September 2000 for macroeconomic variables and NASDAC financial 100 index. It was observed that shocks in monetary policy had negative but significant impact on stock returns. This monetary policy shock could affect the returns of stock for two months. There was no persistence between shocks in economic growth and returns of stock but returns had been positively impacted by unforeseen shocks in economic growth. There was an inverse relationship between inflation rate and returns of stocks and shocks in interest rate could affect the returns of the stock for one month. The last macroeconomic factor of his study was market return which showed the response of returns to market risk immediate and had no persistence in future.

Shahid and Ahmed (2003) investigated that the performance in real and economic sectors affected the SENSEX index in India. The APT frame work of their study comprised of export and foreign exchange rate and foreign direct investment from the period 1997 to 2007. The relationship between real and economic sectors and SENSEX index were examined by Granger causality test. Their findings were that performance in real and economic sectors related to returns of SENSEX index. Moreover Auto Regressive Model employed that showed positive relationship between speculation in the market and SENSEX index.

Altay (2003) demonstrated the returns of assets strongly affected by macroeconomic forces. His dependent variable comprised of returns of German and the Turkish Stock Markets. He also used multi factor model to know the impact of macroeconomic forces on the returns of German and the Turkish Stock Markets. He tested 8 macroeconomic variables (Wholesale Price Index, Imports, Exports, , Average Yield of Public Bonds, Industrial Production Index, Money Market Interest Rate, Consumer Price Index and Foreign Exchange Rate) and concluded that there had been no significant impact of macroeconomic forces on returns of assets.

Nishat and Shaheen (2004) used KSE index to examine its relationship with macroeconomic forces. They employed the vector error correction model during the period 1973 to 2004 to explore the relationship between industrial production, consumer price index, Narrow money supply, the value of investment earning the market rate and Karachi Stock Exchange Index. Their findings showed two variables had long term equilibrium relationship with KSE index. The strongest positive determinant of Pakistani Stock Prices was Industrial production whereas the strongest negative determinant of Pakistani Stock Prices was Inflation during that time period.

Chancharoenchai, Dibooglu and Mathur (2005) investigated the relationship between excess return on the stock and macroeconomic forces at domestic level. Moreover market efficiency in south East Asian economies had been accessed before the period of 1997 Asian crisis. This study also showed the effects of inflation uncertainty on returns. The economic variables included the inflation rate, GDP, the money supply, the interest rate (risk-free rate), and a January dummy variable. Six Asian countries and their stock markets: Thailand (Stock Exchange of Thailand), the Philippines (Philippine Stock Exchange), Indonesia (Jakarta Stock Exchange), Malaysia (Kuala Lumpur Stock Exchange), Korea (Korean Composite Index), and Taiwan (Taiwan Stock Exchange) selected and used monthly data from January 1987 to December 1996. Univariate generalized autoregressive conditional heteroskedasticity GARCH showed that macroeconomic variables had impact on excess return but the extent to which each macroeconomic variable affected from market to market is different. There had been a strong evidence of the significant impact of

inflation uncertainty on monthly stock excess returns or on their time-varying variance.

Rehman and Saeedullah (2005) demonstrated the impact of macroeconomic forces on the returns of Cement industry. In this paper seven cement firms were selected on the basis of data availability, Profitability and performance on Karachi Stock Exchange 100 index. The results of Multi- Index model showed that only Karachi Stock Exchange 100 index had a significant impact on stock returns of cement while other industry variables did not show any contribution in bringing variation in stock returns of cement firms.

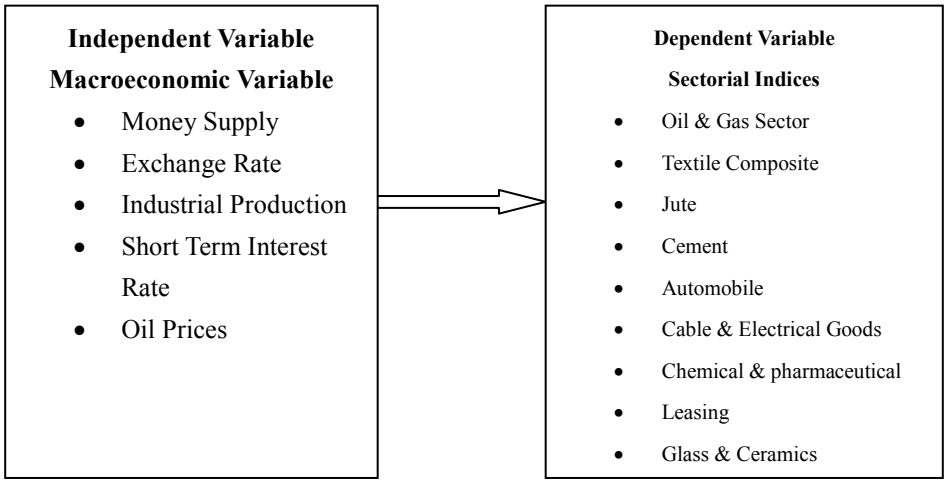
Guns and Cukor (2007), employed the APT model on the returns of London Stock Exchange to investigate the impact of macroeconomic factors on them.They used seven macro economic variables (uncertainty in inflation, Uncertainty in sectoral industrial production, risk premium,interest rate, exchange rate, money supply, unforeseensectoral dividend yield, a residual error for industry portfolio) in their study. They tested the validity of APT model and their findings showed that the returns of London Stock Exchange had been dependent upon these macroeconomic factors.

TursoyGunsol and Rjoub (2008)used monthly data form February 2001 to September 2005 to test the validity of APT model in Istanbul Stock Exchange (ISE).Eleven industrial portfolios examined in response to change in macroeconomic forces. The APT model comprised of thirteen macroeconomic variables crude oil price, consumer price index, import, export, gold price, exchange rate, , gross domestic product, foreign reserve, unemployment rate market pressure index, Industrial production, interest rateand money supply. They concluded that the returns of Istanbul Stock Exchange (ISE) had not been affected by these macroeconomic factors.

Other studies included, Hussain, Mehmood and Ali (2009) measured the relationship between equity prices and macroeconomic forces. Similarly, the impact of macroeconomic forces on the returns of banking sector has been analyzed by Butt, Rehman and Ahmed (2007). Moreover Ihsan et al (2007) used financial and macroeconomic variables in determining the risk return relationship. Ahmed and Farooq (2008) used terrorisam factor such as 9/11 for determining the stock volatility of Karachi Stock Exchange. Trading volume used by Khan and Rizwan (2008) for measring the stock market behavior

2.1 Theoretical Framework

The Theoretical Framework of the study is based upon APT. It is a general theory of pricing of asset. According to this theory the return of the asset is a linear combination of non-diversifiable macroeconomic factors. These macroeconomic factors are the risk factors. The changes in the risk factors are the source of earning risk premium which affect the returns of the stock. The multifactor model of the study is developed under the guidance of literature. Macro economic factors that can potentially affect the returns of the asset have been identified from the literature. These macroeconomic factors are short term interest rate, Money supply M2, Exchange rate, Oil prices and Industrial Production as some principal determinant of variability in stock returns. This study investigates the impact of macroeconomic factors on sectoral returns. The sectors which have been selected in the study are Jute, Cement, Pharmaceutical, Automobile, Electrical goods and Oil and gas sector where as sub sectors which have been elected



for the study are Leasing, Textile Composite and Glass and Ceramics. This is a sectoral study in emerging stock market of Pakistan which has a different structure as compared to developed stock markets. Therefore it is critical to find out the impact of macroeconomic factors and sactoral returns because emerging markets return respond differently in response to macroeconomic variables as compared to developed markets. The diagrammatic relationship between independent and dependent variables is given below

2.2 Hypotheses

On the basis of research theory following Hypothesis has been developed.

H1: Macroeconomic variables have significant impact on Oil and Gas Sector

H2: Macroeconomic variables have significant impact on Textile Composite

H3: Macroeconomic variables have significant impact on Jute

H4: Macroeconomic variables have significant impact on Cement

H5: Macroeconomic variables have significant impact on Automobile

H6: Macroeconomic variables have significant impact on Cable and Electronics

H7: Macroeconomic variables have significant impact on Chemical and Pharmaceutical

H8: Macroeconomic variables have significant impact on Leasing

H9: Macroeconomic variables have significant impact on Glass and Ceramics

3.0 RESEARCH METHODOLOGY

3.1 DATA DESCRIPTION

This study explores the impact of macroeconomic variables on the returns of nine sectors for the period of June 2000 to June 2010 by using monthly data. The macro economic variables included in the study are Money supply M2, Exchange rate, Industrial production, Short term interest rate and Oil prices. Monthly time series of elected sectors for the same period has been taken for explaining the impact of macroeconomic factors on their returns.

Secondary data has been used in the study. The selection criteria of sectors are dependent upon the availability of data in business recorder. The indexes of these sectors have been calculated by equally weighted method. The data for each firm in a sector has been obtained from the web sites of business recorder and Karachi stock exchange for the period of ten years starting from June 2000- June 2010. State bank of Pakistan, Federal bureau of statistics and various editions of economic survey of Pakistan have been consulted for calculating the data of macroeconomic risk factors such as short term interest rate, Exchange rate, Oil prices, Money Supply M2, and industrial production. This study includes macroeconomic variables as independent variables and stock returns of various sectors as dependent variables.

3.1.1. Independent Variables

Exchange Rate

Exchange rate means the rate at which one currency is converted to another. The exchange rate is as end of month Rs. /US$. The relationship between exchange rate and return is negative. If exchange rate of home currency with respect to dollar increases it will affect the cash flows in a negative manner and reduce the return. If the sector involve in export then the relationship of exchange rate with the returns will be positive.

Money Supply M2

Money Supply includes currency in circulation, plus saving and small time deposit, Overnight repos at commercial banks and non-institution money market. This is the key economic indicator since it is not as narrow as M1 and still relatively easy to track. The relationship of Money supply with the returns is positive in the short run as the liquidity is increased due to increase in the money supply. In the long run increase in money supply leads to increase the inflation which affects the return in a negative manner.

Industrial Production

The economic growth in real sector or overall economic activity is indicated by Industrial production index. As the

effect on the expected cash flows due to increase in industrial production is positive. Therefore there is positive relationship between industrial production and returns. If investors withdraw money from stock exchange and want to invest in real sector due to increase in real production in the economy then effect of industrial production with the returns will be negative.

Short Term Interest Rate

A rate which is charged or paid for the use of money is termed as interest rate. In the study Treasury bill rate is used as a proxy of Short term interest rate. Short Term Interest Rate is negatively related to returns because the cash flows are negatively affected due to increase in interest rate.

Oil Prices

Oil prices shows a positive or negative relationship with the returns of sectors .If increase in oil prices increase the cost of production of firms then the relationship of oil prices with the sectors will be negative . On the other hand if increase in the oil prices is a source of increasing revenue of the firms then its relationship with the returns of oil sector will be positive.

3.1.2 Dependent variables

Following formula is used for calculating the returns of sectors

$Rt = \ln (Pt / Pt-1)$

Rt = Return of stock for the time period t.

Pt = Closing prices of the stock for the time period t

Pt-1= Closing prices of the stock for the time period t-1

Nine sectors are randomly selected in order to know the impact of macroeconomic factors on them. These sectors are oil and gas sector, textile composite, Jute, Cement, Automobile, Cable and Electronics, Chemical and Pharmaceutical, Leasing and Glass and Ceramics.

Oil and Gas Index

Listed companies of oil and gas sector in Karachi Stock Exchange are included in this index .This index is comprised of average returns of eight listed companies for the period of June 2000-June 2010.

Textile Composite Index

This index includes listed companies of Textile Composite in Karachi Stock Exchange. Average returns of thirty three listed companies of textile composite are taken for the period June 2000-June 2010 in order to calculate the Textile Composite Index.

Jute Index

Jute Index is calculated by taking the average returns of listed companies of jute sector for the period of June 2000-June 2010. It is comprised of seven listed companies of jute sector in Karachi Stock Exchange.

Cement Manufacturing Index

This index is comprised of twenty listed companies of Cement manufacturing sector for the period June2000-June 2010.It is made by calculating the average returns of these listed companies for the same period.

Automobile Index

Automobile index is calculated by measuring the average returns of twenty five listed companies of automobile sector in Karachi Stock Exchange for the period June 2000- June 2010.

Cable and Electrical Goods Index

Cable and electrical sector is comprised of fifteen listed companies in Karachi Stock Exchange. Its index is measured by calculating the average return of the listed companies of this sector for the period of June2000-June 2010.

Chemical and Pharmaceutical Index

Chemical and Pharmaceutical sector is a big sector .It is comprised of thirty eight listed companies in Karachi Stock

Exchange. Its index is calculated by measuring the average returns of the listed companies of this sector for the period June2000-June2010.

Leasing Index

Leasing sector is also a big sector. It includes thirty two listed companies in Karachi Stock Exchange. Leasing index is measured by taking the average returns of these thirty two listed companies for the period June2000-June2010.

Glass and Ceramics Index

Glass and Ceramics Sector include ten listed companies in Karachi Stock Exchange. Its index is made by calculating the average returns of the listed companies of this sector for the period June2000-June 2010

3.2 Methodology

Four steps have been performed in methodology framework of the study. The chronological properties such as Mean, standard deviation, skewness and Kurtosis of each variable are analyzed through descriptive statistics. The second step is to create correlation matrix in order to show the relationship among independent variables. The third step is to analyze the stationarity of data by the Augmented Dickey Fuller (ADF). This test is helpful in establishing the order of integration of the variables under study. A variable is said to be integrated of order d, I(d), if it is stationary after differencing d times. It means that the variable that is integrated of order greater or equal to 1 is non-stationary. The ADF Test is based on the following equation:

$$\Delta xt = \alpha + \beta t + \rho\, Xt\text{-}1 + \sum_{i=1}^{k} \phi i\, \Delta Xt\text{-}1 + \varepsilon t \quad (1)$$

Where x is the natural logarithm of the series under consideration and t is a trend term, ρ and ϕ are the parameters to be estimated and ε is the error term. In ADF unit root test the null hypothesis is that the series is non-stationary which is either accepted or rejected by comparing the t-statistics of the lagged term Xt -1 with the critical values given in Mackinnon (1991). If the t-value is less than the critical value then the null hypothesis of a unit root (i.e. the series is nonstationary) is accepted. If this is the case the first difference of the series is examined and if the t-value is greater than the critical value then the null hypothesis is rejected and the series is considered stationary with the assumption that the series is integrated of order one I (1). Once the order of integration is established for each variable, the next step is to investigate the effect of economic variables on the stock market returns of individual firms and industry as a whole.

The last step is to know the effect of macroeconomic factors on sectors ordinary least square is employed. OLS stands for Ordinary Least Squares, the standard linear regression procedure. One estimates a parameter from data and applying the linear model

$$y = a + bx + e$$

y = Dependent variable that is return of sector.

a = Constant

x = independent variable that is macroeconomic factors.

b = sensitivity of stock prices due to change in risk factors

e = error term.

After getting monthly closing values of macroeconomic variables and firms of selected sectors returns are calculated according to the formula mentioned above. The main aim of calculating monthly returns of each variable is to eliminate the problem of non-stationarity of data and it also avoids the possibility of spurious regression. The APT model of the study is comprised of monthly observations of five independent variables M2, Exchange Rate, Industrial production, Short term interest rate Oil prices starting from June 2000 – June 2010. The independent variables are expressed with in APT framework as

$$Ri = \lambda o + bi1\lambda 1 + bi2\lambda 2 + bi3\lambda 3 + bi4\lambda 4 + bi5\lambda 5 + \mu t$$

Ri= Return of security

λo= Risk free rate

λ1= Change in Money Supply

λ2= Change in Exchange Rate

λ3= Change in Industrial Production

λ4= Short term interest rate

λ5= Change in Oil prices

μt =error term

bi1=sensitivity of share price due to change in risk factor (Money Supply)

bi2=sensitivity of share price due to change in risk factor (Exchange rate)

bi3=sensitivity of share price due to change in risk factor (Industrial Production)

bi4=sensitivity of share price due to change in risk factor (Short term Interest rate)

bi5=sensitivity of share price due to change in risk factor (Oil prices)

4.0 RESULTS& DISCUSSION

Empirical results of the study include descriptive statistics, correlation matrix and regression results of variables.

4.1 Descriptive statistics.

Descriptive statistics show the temporal properties of data Mean, standard deviation, skewness and Kurtosis of each independent and dependent variables. Tables of descriptive statistics have been presented after references.

Table 4.1.1 indicates that average change in money supply during the period is 0.73%. Its volatility during the data period is 21%.The value of skewness and kurtosis is abnormally high. Kurtosis value is above than 3 which indicate Leptokurtic distribution and most values are concentrated around the mean and there is high probability of extreme values.Skewness is significantly different from zero and positive which shows most values are concentrated on the left of mean ,with extreme values to the right.

Table 4.1.2 shows that average change in exchange rate is 0.4%.Its volatility in the market during the data period is 1.4%.Kurtosis is greater than 3 and skewness is above zero and positive. It indicates rightly skewed distribution and most of the values are concentrated on the left of the mean with extreme values to the right. Moreover the distribution is leptokurtic having the probability of extreme values.

Table 4.1.3 demonstrates that the average change in industrial production is 0.58%.Its volatility is 8.9% with respect to market. Kurtosis is below 3 and skewness is departing from zero. Most of the values lie on the right of the mean and extreme values of this distribution is on the left of the mean. The distribution is lefty skewed.

Table 4.1.4 narrates that the average interest rate is 0.8%.Its volatility is 3.6% in changing economic conditions in market. The skewness value is departing from zero and kurtosis is below 3.Therefore the interest rate data is lefty skewed. The minimum change in interest rate during the data period is 1.2% and maximum change occur in its value is 14%.

Table 4.1.5 depicts that the average change in oil prices is 0.7% during the data period. The volatility in oil prices is 9.2% in the market. Kurtosis is below three but skewness is above one and in negative. Therefore the distribution is left skewed and most values are concentrated on the right of the mean with extreme values to the left. The maximum change in oil prices during the data period is 20%.

Table 4.1.6 indicates that the average return of oil and gas sector is .007117.The volatility in returns of oil and gas sector is 10.2%.Kurtosis is about to three which shows oil and gas index is not departing from normality and the probability for extreme values of returns is less in oil and gas sector. Skewness is negative which shows that there is a probability of loss in response to variation in macroeconomic factors. The maximum monthly return of this sector is 29% and the loss this sector can bear in a month is 38%.

Table 4.1.7 demonstrates that the average monthly return of textile composite sector is in negative which indicates this sector face a loss of .02% in a month. It has a volatility of 6.29% in returns. The value of kurtosis is less than

three. The value of skewness is rightly skewed with extreme values lie on the right side and bulk of the values is on the left of the mean. The minimum return of this sector is in negative that is 15% and the maximum return textile composite earns during the month is 18%.

Table 4.1.8 indicates that the average return of Jute sector in a month is .39%. Jute sector has a volatility of 9.47% in its return due to change in economic conditions. Kurtosis is less than three. Skewness is departing from zero it means there is probability of extreme values of returns around right of mean Majority of the values lie on the left of the mean. Positive value of skewness shows the probability of occurrence of profit in future. The minimum return of this sector during the month is in negative that is 31% where as the maximum monthly return earns on jute sector is 34%.

Table 4.1.9 indicates that the monthly return of cement sector is in negative. It earns a loss of .04% during the month. It shows a volatility of 11.3% in returns on the basis of historical data. The Kurtosis value is less than three. The skewness is departing from zero which indicates value of returns usually fall around the left of the mean .The minimum return, cement sector can earn is in negative that is a loss of 27% may occur during the month. The maximum return Cement sector can earn is 46% during the month.

Table 4.1.10 illustrates that the average return earn on this sector is in negative which indicates a loss of .80% during the month. It shows a volatility of 8.1% in its return. Kurtosis is less than three which shows distribution is symmetrical. Skewness is departing from zero it means return fall around the left of mean. The minimum return earn on this sector is in negative which indicates a loss of 16%. This sector gives a maximum return of 22% during the month.

Table 4.1.11 shows that this sector has an average return of .045%.Kurtosis is less than three Skewness is positive and is statistically different from zero. Therefore the values of return of this sector fall around the left of mean and there is the probability of occurrence of extreme values of return on the right of the mean. The maximum return of this sector during the month is 34% and minimum return the sector earns is -21%.

Table 4.1.12 depicts that the Chemical and Pharmaceutical industry earns monthly average return of .53%.Kurtosis is less than three and skewness is departing from zero which indicates most of the values lie on the left of the mean and extreme values lie on the right of the mean .Minimum return of this sector is -15% and the maximum return earn on this sector during the month is 19.9%.

Table 4.1.13 shows that the Leasing sector's average return during the month is negative. This sector faces a loss of 0.83% during the month. Volatility is 7.7% in returns due to change in economic conditions in market.Skewness is not significantly different from zero and kurtosis is less than three which indicates the normality and symmetrical distribution of data. This sector can earn a monthly loss of 25% and maximum monthly return of 24.6%.

Table 4.1.14 indicates that the average return of Glass and Ceramics is -0.30% On the basis of historical data it can be said that this sector earns a monthly loss. This sector has a volatility of 9.7% in its return with respect to market. Kurtosis is less than 3 and the value of skewness is also statistically significant to zero. Therefore the data is normal and most of the values lie around the mean. The maximum average return on this sector is 33% and the loss this sector has faced during the data period is 36%.

4.2 Statistical Tests

First of all statistical tests are performed in order to test the applicability of model. There are many models which can be employed in order to know the impact of macroeconomic variables on the returns of different sectors. These models include Ordinary Least Square, ARMA, ARIMA, FARIMA, ARCH and GARCH but the conditions for the implication of each model is different .OLS is employed when there is no autocorrelation, heteroskedasticity and muticolinearity exist in data. ARIMA/FARIMA/ARMA is employed when autocorrelation exist but heteroskedasticity and multicolinearity do not exist in the data.Hetroskedisticity and autocorrelation exist simultaneously in data then ARCH/GARCH family is employed.

4.2.1 Unit Root Test

In order to know the stationarity of time series unit root test is employed. Time series data can be stationary or non stationary. A series is said to be stationary if the mean, variance and auto-correlation are invariant with respect to time. Therefore all the data need to be analyzed for unit root before employing any statistical model. For this purpose Augmented Dickey Fuller Test (ADF) is employed on returns with a null hypothesis that there is unit root in data

series and an alternate hypothesis with no unit root i.e. series is stationary. The results of ADF of all data series including macroeconomic variables and sectorial returns are illustrated in table 4.2.1A and 4.2.1B

Table 4.2.1A **Unit Root Test of Macroeconomic Forces** indicates that T- statistics is exceeding than critical values it means data is stationary at a level rejecting the null hypothesis that there is unit root in the data. This testing is necessary in order to avoid the spurious regression.

Table 4.2.1 B **Unit Root Test of Sectoral Returns** shows that in sectoral returns T-statistics is also less than critical values it means data is stationary at level. The series has no unit root therefore null hypothesis is rejected that unit root exist in data.

Table 4.2.2 **Correlation Matrix** indicates that the Industrial production, Oil Prices and interest rate are positively related to money supply where as there is inverse relationship between Money supply and Exchange rate. All the values are below than 0.5 and approximately equal to 0.2 .Therefore the strength of relationship between money supply and other independent variables is negligible. Industrial production is negatively related to exchange rate where as interest rate and oil prices are positively related to exchange rate but the strength of relationship is negligible because the value is less than 0.1. Therefore no relationship exists among industrial production, exchange rate, interest rate and oil prices. Interest rate is negatively related to industrial production but oil prices are positively related to industrial production and the strength of relationship among these variables is negligible. Interest rate and oil prices are negatively related to each other and the strength of relationship is also negligible between these two variables. Therefore no multicollinearity exists among independent variables.

4.3. Regression Results and Discussion

Descriptive statistics of sectorial returns show that kurtosis is less than or approximately equal to three it means distribution is normal and skewness is also not statistically different from zero therefore value of returns fall about to mean so there is no hetroskedisticity exist in data. Moreover there is no multicollinearity exist among macroeconomic variables. Unit root test shows stationarity of data at a level which shows no autocorrelation exist with respect to time Usually autocorrelation exist when the time interval is small like daily and weekly . Faff, Hodgson and Kremmer (2005) used discrete monthly returns that run from January 1978 to December 1998. According to study the choice of the monthly sampling interval, over a long historical period was intended to capture long-term movements in volatility and to avoid the effects of settlement and clearing delays which were known to significantly affect returns over shorter sampling intervals. Ibrahim (1999) and Patra and Poshakwale (2006)(as cited by Zaheer) used monthly data to avoid spurious correlation problem. Therefore OLS is employed on monthly data of macroeconomic variables and sectoral returns to know their impact. Regression results of each sector have been illustrated in tables (4.3.1-4.3.9) after references.

Table 4.3.1 shows the results of OLS model with returns of oil and gas. The value of Significance F is less than 0.05 which indicates macroeconomic factors have a significant but minor impact on returns of oil and gas sector. The independent variables when analyzed on an individual basis Oil prices is the only variable that has a significant positive relationship with stock returns of oil and gas sector. 100% change in Oil prices can cause the change of 26% in the returns of oil sector. Money supply and Industrial Production and Exchange rate cause negative variation in the returns of oil and gas sector but the impact is insignificant. Interest rate has negative and insignificant impact on returns of oil and gas sector as their probability is less than 0.05.

Table 4.3.2 shows the results of OLS model with Textile Composite as a dependent variable. The value of Significance F is less than 0.5 which indicates macroeconomic factors have significant impact on the returns of textile composite. These macroeconomic factors contribute minorly in variations of returns of textile composite. Interest rate has a positive and significant relationship with the returns of textile composite. 100% change in interest rate can affect the returns of textile composite by 57.5%. Money Supply, Industrial Production and Oil prices have negative insignificant relationship with the returns of textile composite just as hypothesized. Exchange rate is positively related to the returns of textile composite but the impact is insignificant.

Table 4.3.3 shows the results of OLS model with Jute as dependent variable. The value of significance F is greater than 0.05 which reveals that the impact of macroeconomic factors on the returns of jute is insignificant. Money Supply, Interest Rate and Exchange Rate are negatively related to returns of Jute. Oil prices and Industrial Production have insignificant positive relationship with the returns of Jute.

Table 4.3.4 indicates the results of OLS model with cement as dependent variable. As the value of significance f is less than 0.05 therefore the impact of macroeconomic factors on the returns of cement is significant but there contribution to bring variation in returns of Cement is only 7%. When macroeconomic variables are analyzed individually only interest rate has negative and significant impact on the returns of Cement. 100% change in interest rate can cause variation of 75% in the returns of cement. Industrial Production and oil prices are positively related to the returns of Cement but their impact is insignificant. Money Supply and exchange rate have negative but insignificant relationship with the returns of Cement.

Results of OLS show that there is significant impact of macroeconomic variables on the returns of Automobile. (Table 4.3.5).Interest rate has negative and significant relationship with the returns of Automobile.100% change in interest rate can bring the variation of 54% in the returns of Automobile. Money supply, Industrial production and Exchange rate have negative but significant relationship with the returns of Automobile. Oil prices are positively related to returns of automobile but its impact is insignificant.

Table 4.3.6 reveals the results of OLS model with returns of Cable and Electronics as dependent variable. Interest rate and Exchange rate have negative and significant relationship with the returns of Cable and Electronics.1% change in exchange rate can cause the change of 1.30 in the returns of Cable and Electronics. Similarly 0.60variatins in returns is caused by 1% change in interest rate. Industrial production has negative but insignificant relationship with the returns of Cable and Electronics where as Oil prices has positive insignificant relationship with the returns of Cable and Electronics.

Table 4.3.7 indicates the results of OLS model with returns of Chemical and Pharmaceutical as dependent variable. Significance F is less than 0.05 which shows macroeconomic factors have significant impact on the returns of Chemical and Pharmaceutical. Only Interest rate has negative but significant impact on the returns of Chemical and Pharmaceutical. 100% change in interest rate can bring variation of 50% in the returns of Chemical and Pharmaceutical. Money Supply, Industrial production are negatively related to the returns of Chemical and Pharmaceutical. Oil prices have positive and insignificant relationship with the returns of Chemical and Pharmaceutical.

Table 4.3.8 shows the results of OLS model with returns of leasing as dependent variable. The value of significance F is less than 0.05 which indicates macro economic variables have a significant impact on returns of leasing. But Low value of adjusted R^2 depicts the contribution of macroeconomic variables to the variation in returns is very small. When macroeconomic variables are studied individually only interest rate has negative and significant impact on returns of leasing sector.100% change in interest rate can bring variation of 74% in the returns of leasing. Money Supply, Exchange Rate, Oil Prices and industrial Production have negative insignificant relationship with the returns of leasing.

Table 4.3.9 reveals the results of OLS model with Glass and Ceramics as dependent variable. The impact of macroeconomic variables on the returns of Glass and Ceramics are significant but their contribution to change in return is monor.Interest rate is negatively related to the returns of Glass and Ceramics and its impact is significant.100% change in macroeconomic contribution can contribute to 52% variation in the returns of Glass and ceramics. Oil prices have positive but insignificant relationship with the returns of Glass and Ceramics. Money supply, Industrial Production and Exchange rate have negative and insignificant relationship with the returns of Glass and Ceramics.

5.0 Conclusion

Stock market is one of the key stakeholders of the financial sector of the economy. The number of firms listed in Karachi Stock Exchange belongs to different sectors. Stock market has performed remarkably well during the last decade in the presence of positive economic indicators in the economy. The impact of macroeconomic factors on returns of selected sector is analyzed at sector level. The results of descriptive statistics of different sector reveal that most of the data series is mesokurtic and skewness is not statistically different from zero therefore all data series are normally distributed.

Unit root test is essential in exploring the stationarity of time series data so Augmented Dickey Fuller (ADF) test is applied on stock returns. The results of unit root test disclose that all data series are stationary at level rejecting the null hypothesis of unit root.The results of Correlation matrix indicate that independent variables are related to one

another but the strength of relationship is less than 0.1 therefore no multicollinearity exist among independent variables.

Ordinary Least Square (OLS) is employed in order to know the impact of macro economic factors on the returns of selected sectors. Results of OLS show that the impact of macroeconomic factors on the returns of sectors is significant except Jute. The nature of jute is inelastic and inelastic products are usually least sensitive to change in macroeconomic conditions in economy. The other technical reason for its non responsiveness to macroeconomic factor is that its index is comprised of seven companies only. Results of OLS also reveal that the contribution to macroeconomic factors in variation of returns of different sectors is small. This is not unexpected, as other international and domestic macroeconomic variables (e.g., production, inflation, dividend yield, and trade balance and rate structure) may also have a role in the determination of stock price expectations. Further research into the relationship between these other macroeconomic variables and stock prices is warranted.

When macro economic factors are studied individually interest rate has a negative but significant impact on different sectors except Jute and Oil and Gas sector. The products of these sectors are of inelastic nature therefore these sectors are least sensitive to change in economic Conditions. Increase in interest rate leads to increase in discount rate and it ultimately results in decrease in present values of future cash flows that is the fair intrinsic value of shares. Therefore interest rate affects the returns of sectors in a negative manner just as hypothesized in data. Chen et al. (1986) and Sill (1995) recognized that the stock market returns were significantly explained by the factors like, interest rate.

Oil prices have only shown a positive and significant impact on oil and gas sector. However for oil and gas sector increase in oil prices increases the corporate revenue and profit. So oil prices are positively related to equity prices of oil and gas sector's return. Oil prices have no significant impact on the returns of remaining sectors. Oil prices Shows a mixed trend in relationship with the returns of sector .Oil prices positively affect the returns of Banks, Jute, Cement, Automobile, Chemical and Pharmaceutical and Glass and Ceramics. The relationship of oil prices with the returns of Textile Composite, Cable and Electronics and leasing sector is negative. The impact of Oil prices on various sectors except Oil and Gas sector is insignificant. Hassan and Nasir (2008) found that Oil Prices have insignificant impact in determining the equity prices.

Exchange rate has negative and significant impact on Automobiles and Cable and Electronics. Depreciation in home currency is negatively related to equity prices and in turn reduces return. So its negative relationship with the returns of these sectors is according to the hypothesis made in data. Exchange rate has positive relationship with the returns of textile composite because the products of this sector are exported to abroad and the amount is received in foreign currency. Exchange Rate has negative and insignificant relationship with the returns of Glass and Ceramics, Leasing, Cement, Jute .Oil and Gas sector and chemical and Pharmaceutical.Zaheer, Rehman, Assam and Safwan (2009) found mixed relation ship between Exchange Rate and Returns of Stock Exchange in their study.

Money Supply M2 has negative but insignificant impact on all the sectors except Cable and Electronics. Increase in money supply leads to increase the inflation rate which results in decrease in present values of future cash flows and in turn reduces return in long run. The negative relationship of Money Supply with the returns of sectors is according to the hypothesis made in data. Its positive relationship with the returns of Cable and Electronics indicates increase in Money Supply leads to increase in liquidity in the short run that ultimately results in upward movement of nominal equity prices and in turn return increases. Sohail and Hussain (2009) found the relationship of Money Supply with the stock returns.

Industrial Production has mixed relationship with the returns of selected sectors just as hypothesized. Though the impact of Industrial Production on returns of selected sectors is not significant. Industrial Production shows negative relationship with the returns of Oil and Gas sector, Textile Composite, Automobile, Cable and Electronics Leasing, Glass and Ceramics and Chemical and Pharmaceutical. The returns of Jute and Cement have positive relationship with industrial production. The negative relationship between stock returns and real output depicts that investment diverts from the stock market to real activity as a result of its expansion in the economy.Altey (2003) found the relationship between Industrial production and stock returns.

5.1 Recommendations and Future Implications

The main aim of the study is to identify the macroeconomic factors which have the impact on returns of various sectors. Some recommendations are illustrated below by keeping in mind the results, discussions and conclusion.

Although short term interest rate affect the returns of various sectors however other economic factors like Exchange Rate and Oil Prices have also shown some significance at the sector level. So these macroeconomic factors should be attentively judged by investors as well as institutional investors before making any investment in Karachi Stock Exchange.

The returns of the stock at sector level have been adversely affected by decrease in home currency with respect to dollar. The progress of capital market is based upon the currency which is soothed through out the period and this is not possible without accurate monitory policy. Therefore respective authorities should design accurate monetary policy in order to stabilize the home currency. A good monetary policy helps the investors to forecast accurate financial assertions for making investment decision in Karachi Stock Exchange.

The regulator of money supply in the country is State bank of Pakistan. Increase in money supply normally affects the return positively but in the study regression result shows that returns are negatively affected by expansion in money supply so it is the duty of State bank of Pakistan to take remedial measures to regulate the money supply in the economy. In this way maximum benefit can be achieved by investors from this monetary gadget.

Sectoral analysis is a better approach for both investors as well as regulators. In sectoral study the impact of macroeconomic factors is studied on various sectors. These sectors belong to manufacturing, consumption, servicing etc. The performance of different sectors in same economic conditions is different. This gives an idea of risk diversification to investors and enables them to design well diversified portfolios.

The study also helps the investors to understand the risk return relationship at sector level. The risk factors which are involved in the determining equity prices can easily be identified with in an APT framework. OLS is applied to measure the strength of relationship between risk factors and returns of sectors in similar economic conditions. This result of study indicates the effect of limited macroeconomic risk factors on the returns of various sectors. The researchers can use risk factors other than the study to make it more comprehensive.

There are many conventions for studying the risk return relationship such as conditional volatility, long term and short term equilibrium relationship between macroeconomic factors and returns. The researchers can employ sophisticated models for such purpose and can find out an improved explanation of risk and return relationship.

REFERENCES

Akhter,H. (2009) . The impact of macroeconomic factors and policy issues on telecom sector performance in Pakistan: An Econometric analysis" .*Pakistan Journal of Social Sciences*. 29 (2). 163-174.

Ali , B.(2011) "Impact of Micro and Macroeconomic Variables on Emerging Stock Market Return : A Case on Dhaka Stock Exchange", *Interdisciplinary Journal of research in Business* .1(5) 8-16.

Ahmed, S. and Farooq, O. (2008)," The effect of 9/11 on the Stock Market Volatility Dynamics: Empirical Evidence from front line State". *Research Journal of finance and Economics* Issue 16

Bennett A. (2001). "Can Money Flows Predict Stock Returns?".*Financial Analyst Journal*. 57(6). 64-77.

Butt, B.Z., Rehman, K.U., Khan, M.A., Safwan, N. (2010). "Do macroeconomic factors influence stock returns? A firm and industry level analysis". *African Journal of Business Management* .4(5). 583-593

Buyuksalvarei,A.(2010). "Effect of Macroeconomic variables on Stock Returns: Evidence from Turkey".*European Journal of Social Sciences* 14(3).404-416.

Butt,Z.B., Rehman,K. and Ahmed, A.(2007) "An Empirical Analysis Of Market and Industry factors in stock Returns of Pakistan Banking Industry". *South Asian Journal of Management* .14(4) 7-19.

Bennett A. (2001). "Can Money Flows Predict Stock Returns?".*Financial Analyst Journal*. 57(6). 64-77.

Chen, N. (1983). "Some Empirical Tests of the Theory of Arbitrage Pricing", *The Journal of Finance*. 38. 1393-1414.

Chen, N. F., Roll, R., & Ross, S. (1986). "Economic forces and the stock market". *Journal of Business*. 59. 383-403.

Chancharoenchai, K., Dibbooglu, S.&Mathur, K.(2005). "Stock returns and the Macro economic environment prior to the Asian countries". Emerging Finance and Trade. 41. 38-56.

Chinzara ,Z. (2011). "Macro economic uncertainty and conditional stick market volatility in south Africa". South African Journal Of Economics. 79(1).

Ewing. (2002). "Macro Economic News and the return of financial Companies "managerial and decision economics. 23. 439-446.

Economic Survey of Pakistan various editions (2000-2010): *Ministry of Finance*

Flannery, M. J. &Protopapadakis, A. A. (2002). "Macroeconomic factors do influence aggregate stock returns". *The Review of Financial Studies.* 15(3). 751-782.

Fama,E.F.(1970). "Efficient Capital Market:A Review of Theory and Empirical Work", *Journal of Finance.* 71.545-565.

Fama , E.F., (1981). "Stock Returns Real Activity , Inflation and Money" , *American Economic Review* 71. 545-565.

Goswami, G.(1997),**.**"Stock Market and Economic Forces: Evidence From Korea", *Journal Of Finance.* 56. 500-757.

Gan, C .Lee, M.Yong, H.H.A. & Zhang, J. (2006) "Macroeconomic Variables and Stock Market Interactions: New Zealand Evidence". *Investment and Financial Innovations*. 3 (4). 89-100

Gabriel,M. (2010)." Measuring the Impact of Macroeconomic Indicators On the leasing Industry. *Economic Thesis* 1-65.

Gay &Robart. (2008). "Effect of Macroeconomic Factors on Stock Returns for four Emerging Economies Brazil Russia India & China. *International Business and Economics research Journal.* 7(3) .1-8.

Gunsel, N.&Cukur,S. (2007). "The Effects of Macroeconomic Factors on the London Stock Returns .A Sectoral Approach" *International Research Journal of Finance and Economics* 10.140-152.

Ibrahim, H. M., (1999). "Macroeconomic variables and Stock prices in Malaysia: An Empirical Analysis", *Asian Economic Journal* .13.219-231.

Ihsan, H. Ahmad, E. Ihsan, M. and Sadia, H.(2007). "Relationship of Economic and Financial Variables with behavior of stock returns". *Journal of Economic Cooperation* 28(2). 1-24.

Jeon, B.N., & B. Seo. (2003). "The Impact of the Asian Financial Crisis on Foreign Ex change Market Efficiency: The Case of East Asian Countries." *Pacific-Basin Finance*. 11. 509-525.

Javed,& A.H (2005). "Arbitrage pricing theory: evidence from an emerging stock market". *The Lahore Journal of Economic,* 10. 123-139.

Khalid, M.B. Shakeel,A. & Ali S.M.M. (2010)" Post Liberalization Impact of Macroeconomic Factors on the Stock market Returns". *Interdisciplinary Journal of Contemporary Research in Business*.1(12).63-73.

Karan,M.(2010). "Autoregressive Multifactor APT Model for US Equity Markets." *MIPRA Paper* 16(47)1-45.

Khan, S. and Rizwan,F.(2008). "Trading Volume and Stock Returns: Evidence from Pakistan's Stock Market". *International Review of Business Research*. 4(12). 151-162.

L.M, .S.,&Menike (2006)."Effect of Macroeconomic Variables on Stock Prices in Emerging Sri Lankan Stock Market". Journal. 6(1). 50-67

Lucey, B. Najadmalayeri, A.&Singh,M.(2008) " Impact of Macroeconomic Surprises on Stock Market returns in developed Economies. *The Institute for International Integration Studies*240.

Mukherjee, T.K., & A. Naka. (1995). "Dynamic Relations Between Macroeconomic Variables and the Japanese Stock Market: An Application of a Vector Error Correction Model." *Journal of Financial Research*. 18. 223-237.

Maysami, R. C. Howe, L.C.&Hamzah, M.A. (2004). "Relationship between Macroeconomic Variables and Stock Market Indices: Cointegration Evidence from Stock Exchange of Singapore's All-S Sector Indices" *Journal of Pengurusan*. 24. 47-77.

Mushtaq, K., Ghafoor,A. Abdullah &Ahmad,F.(2011) " Impact of Monetry and Macroeconomic Factors On wheat Prices In Pakistan : Implication For food Security". *The Lahore Journal of Economics.* 16 (1) 95-110.

Muneer,S. Zaheer,B. Rehman,K (2011) " A Multifactor Model of Banking Industry Stock Returns :An Emerging Market Perspective". *Information Management and Business Review* 2(6) 267-275.

Mehmood,S. Hussain,A. &Ali,A.(2009) " Impact of Macroeconomic Variables on Stock Prices : Empirical Evidence in case of KSE". *Euro Journal Inc*.103.

Nadeem&Zakir .(2009)."Long-Run and Short-Run Relationship between Macroeconomic Variables and Stock Prices in Pakistan". 47 .183.

Ramin, M, L.C., H, &Howe, M.A.H. (2009). "Relationship between Macroeconomic Variables and Stock Market Indices*". Journal Pengurusan* .47-77

Rehman, K. and Saeedullah, M. (2005) "Empirical Analysis of Markets and Industry Factors in stock returns of Pakistan Cement Industry". *Journal of Independent Studies and Research* .3(2)

Shahid A. (2008)." Aggregate Economic Variables and Stock Markets in India". *International Research Journal of Finance and Economics* (14).

Sulaiman, A.H., M.A & A.A. (2009). "Impact of Macroeconomics Variables on Stock Prices". *Euro Journals*. 38. 96.

Sohail , N., Hussain , Z . (2009). " Long run and short run relationship between macroeconomic variables and stock prices in Pakistan the case of Lahore stock exchange" .*Pakistan Economic And Social Review* . 47 (2). 183-198

Tursory F&Gunsel (2008). "The APT and Istanbul Stock market". *International Research Journal of Finance And Economics.* (22).

Zaheer, B (2010). "Economic Forces and Stock Market Returns: A Cross Sectoral Study testing Multi Factor Model". World Applied Sciences 9(3).922-982.

Table 4.1.1 Descriptive Statistics of Money Supply

Mean	0.007379913
Median	0.009581079
Standard Deviation	0.213136879
Skewness	2.5032391611
Kurtosis	14.22355768
Range	2.375050743
Minimum	-2.315756984
Maximum	0.059293759

Table 4.1.2 Descriptive Statistics of Exchange Rate

Mean	0.004101916
Median	0.000897881
Standard Deviation	0.01422019
Skewness	1.416431398
Kurtosis	5.711299829
Range	0.103218048
Minimum	-0.03966359
Maximum	0.063554461

Table 4.1.3 Descriptive Statistics of Industrial production

Mean	0.005827514
Median	0.007414097
Standard Deviation	0.089303846
Skewness	-0.238091905
Kurtosis	2.285405656
Range	0.570832988
Minimum	-0.287682072
Maximum	0.283150916

Table 4.1.4 Descriptive Statistics of Interest Rate

Mean	0.081521965
Median	0.0889645
Standard Deviation	0.036130757
Skewness	-0.560216609
Kurtosis	-0.793422369
Range	0.129473
Minimum	0.012116
Maximum	0.141589

Table 4.1.5 Descriptive Statistics of Oil Prices

Mean	0.007181122
Median	0.021962825
Standard Deviation	0.092224545
Skewness	-1.071502058
Kurtosis	2.152604149
Range	0.539809612
Minimum	-0.336681172
Maximum	0.20312844

Table 4.1.6 Descriptive Statistics of Oil and Gas Sector

Mean	0.007117
Median	0.01694
Standard Deviation	0.102677
Skewness	-0.81013
Kurtosis	2.857109
Range	0.674694
Minimum	-0.38448
Maximum	0.290213

Table 4.1.7Descriptive Statistics of Textile Composite

Mean	-0.002175348
Median	0.000750515
Standard Deviation	0.062978627
Skewness	0.293608627
Kurtosis	0.763016494
Range	0.343635235
Minimum	-0.153991347
Maximum	0.189643889

Table 4.1.8 Descriptive Statistics of Jute

Mean	0.003900393
Median	-0.004432799
Standard Deviation	0.09478938
Skewness	0.184137595
Kurtosis	2.36617955
Range	0.657573864
Minimum	-0.316101552
Maximum	0.341472312

Table 4.1.9 Descriptive Statistics of Cement

Mean	-0.000411017
Median	0.000834871
Standard Deviation	0.113706443
Skewness	0.794520393
Kurtosis	2.164288587
Range	0.731958142
Minimum	-0.271721098
Maximum	0.460237044

Table 4.1.10 Descriptive Statistics of Automobile

Mean	-0.008048817
Median	0.003959977
Standard Deviation	0.081020572
Skewness	0.151935914
Kurtosis	-0.13081805
Range	0.385946256
Minimum	-0.164249085
Maximum	0.22169717

Table 4.1.11 Descriptive Statistics of Cable an Electrical Goods

Mean	0.00045461
Median	-0.010050875
Standard Deviation	0.083506165
Skewness	0.601813797
Kurtosis	2.198627712
Range	0.556318484
Minimum	-0.212331697
Maximum	0.343986787

Table 4.1.12 Descriptive Statistics of Chemical and Pharmaceutical

Mean	0.005313707
Median	-0.001876639
Standard Deviation	0.061595787
Skewness	0.048406852
Kurtosis	0.444946348
Range	0.350150777
Minimum	-0.150450782
Maximum	0.199699995

Table 4.1.13 Descriptive Statistics of Leasing

Mean	-0.008321682
Median	-0.004505569
Standard Deviation	0.077736439
Skewness	-0.021035277
Kurtosis	1.462138971
Range	0.50089475
Minimum	-0.254048974
Maximum	0.246845776

Table 4.1.14 Descriptive Statistics of Glass and Ceramics

Mean	-0.003039088
Median	-0.008893274
Standard Deviation	0.097420937
Skewness	-0.016500379
Kurtosis	2.681649326
Range	0.702844786
Minimum	-0.367953663
Maximum	0.334891122

Table 4.2.1A Unit Root Test of Macro Economic Variables

MacroEconomic Variables	**t- statistics**	**1%CV**	**5%CV**	**10%CV**	**P-value**
Money Supply	-9.54262	-3.48859	-2.88696	-2.5804	0
Exchange Rate	-4.824731	-3.48912	-2.88719	-2.58053	0.0001
Industrial Production	-8.596119	-3.49135	-2.88816	-2.58104	0
Interest Rate	-4.75316	-3.48806	-2.88673	-2.58028	0
Oil Prices	-7.911424	-3.48655	-2.88607	-2.57993	0

Table 4.2.1B Unit Root Test of Sectoral Returns

Sectoral returns	t- statistics	1%CV	5%CV	10%CV	P-value
Oil & Gas sector	-9.474184	-3.48655	-2.88607	-2.57993	0
Textile	-10.54871	-3.48655	-2.88607	-2.57993	0
Jute	-12.92438	-3.48655	-2.88607	-2.57993	0
Cement	-9.306992	-3.48655	-2.88607	-2.57993	0
Automobile	-8.841555	-3.48655	-2.88607	-2.57993	0
Cable & Electrical Goods	-8.924507	-3.48655	-2.88607	-2.57993	0
Chemical & Pharmaceutical	-8.687092	-3.48655	-2.88607	-2.57993	0
Leasing	-8.778958	-3.48655	-2.88607	-2.57993	0
Glass & Ceramics	-5.593228	-3.48705	-2.88629	-2.58005	0

Table 4.2.2 Correlation Matrix of Independent Variables

Independent Variables	Money Supply	Exchange Rate	Industrial Production	Interest rate	Oil prices
Money Supply	1				
Exchange Rate	-0.134563729	1			
Industrial Production	0.067111747	-0.060809897	1		
Interest rate	0.017419862	0.190650934	-0.021804052	1	
Oil prices	0.072348929	0.05897733	0.048580794	-0.1504156	1

Table 4.3.1 Co-efficient Regression Results of Oil& Gas Industry

Macroeconomic Factors	Coefficient	T Statistic	P Value
intercept	-0.0440358	1.93513047	0.05545143
Money supply	-0.02091	-0.4846572	0.62884949
Exchange Rate	-0.9507	-1.4420403	0.15203266
Industrial Production	-0.4114	-1.1194456	0.26530315
Interest Rate	-0.42187	-1.6276624	0.10635727
Oil Prices	0.262181	2.61683341	0.010078
Adjusted R^2	0.075291		
Significance F	0.015635248		

Table 4.3.2 Co-efficient Regression Results of Textile Composite

Macroeconomic Factors	Coefficient	T Statistic	P Value
Intercept	0.043888	3.141652	0.002141
Money supply	-0.019744	-0.745531	0.457485
Exchange Rate	0.208245	0.514535	0.607874
Industrial Production	-0.025671	-0.410613	0.682127
Interest rate	-0.575425	-3.61647	0.000446
Oil Prices	-0.000494	-0.008037	0.993601
Adjusted R^2	0.0737		
Significance F	0.016948		

Table 4.3.3 Co-efficient Regression Results of Jute

Macroeconomic Factors	Coefficient	T Statistic	P Value
Intercept	0.042895	1.982122	0.049872
Money supply	-0.03859	-0.940637	0.34888
Exchange Rate	-0.754283	-1.20305	0.23145
Industrial Production	0.018554	0.191574	0.848417
Interest rate	-0.450101	-1.826065	0.070458
Oil Prices	0.055677	0.58434	0.560146
Adjusted R^2	0.018708		
Significance F	0.210565		

Table 4.3.4 Co-efficient Regression Results of Cement

Macroeconomic Factors	Coefficient	T Statistic	P Value
Intercept	0.064761	2.569034	0.011489
Money supply	-0.02648	-0.554109	0.58059
Exchange Rate	-1.247314	-1.707863	0.090384
Industrial Production	0.06032	0.534687	0.593908
Interest rate	-0.753557	-2.624523	0.009866
Oil Prices	0.115369	1.039461	0.30079
Adjusted R^2	0.07468		
Significance F	0.016128		

Table 4.3.5 Co-efficient Regression Results of Automobile

Macroeconomic Factors	Coefficient	T Statistic	P Value
Intercept	0.056963	3.230878	0.001613
Money supply	-0.026782	-0.801305	0.424622
Exchange Rate	-1.280643	-2.507148	0.01358
Industrial Production	-0.039987	-0.506792	0.61328
Interest rate	-0.543153	-2.704771	0.007883
Oil Prices	0.090963	1.171812	0.243716
Adjusted R^2	0.108498		
Significance F	0.002685		

Table 4.3.6 Co-efficient Regression Results of Cable and Electronics

Macroeconomic Factors	Coefficient	T Statistic	P Value
Intercept	0.056162	3.086789	0.002541
Money supply	0.009682	0.280708	0.779443
Exchange Rate	-1.309638	-2.484496	0.014426
Industrial Production	-0.034872	-0.42827	0.669263
Interest rate	-0.6092	-2.939704	0.003978
Oil Prices	-0.055376	-0.691278	0.490796
Adjusted R^2	0.106272		
Significance F	0.003035		

Table 4.3.7 Co-efficient Regression Results of Chemical and Pharmaceutical

Macroeconomic Factors	Coefficient	T Statistic	P Value
Intercept	0.048965	3.661853	0.000381
Money supply	-0.011268	-0.444496	0.657527
Exchange Rate	-0.590095	-1.523214	0.130474
Industrial Production	-0.054268	-0.906863	0.366392
Interest rate	-0.509968	-3.348407	0.001102
Oil Prices	0.080196	1.362181	0.175826
Adjusted R^2	0.112769		
Significance F	0.002119		

Table 4.3.8 Co-efficient Regression Results of Leasing

Macroeconomic Factors	Coefficient	T Statistic	P Value
Intercept	0.054306	3.204051	0.001757
Money supply	-0.007299	-0.227174	0.820695
Exchange Rate	-0.40648	-0.827776	0.409527
Industrial Production	-0.088706	-1.169453	0.24466
Interest rate	-0.742023	-3.843686	0.0002
Oil Prices	-0.000876	-0.01174	0.990654
Adjusted R^2	0.105006		
Significance F	0.003253		

Table 4.3.9 Co-efficient Regression Results of Glass and Ceramics

Macroeconomic Factors	Coefficient	T Statistic	P Value
Intercept	0.044119	2.036855	0.043981
Money supply	-0.030125	-0.733648	0.464669
Exchange Rate	-1.090957	-1.738481	0.084826
Industrial Production	-0.12931	-1.333983	0.184868
Interest rate	-0.528997	-2.144236	0.034138
Oil Prices	0.135563	1.421495	0.157903
Adjusted R^2	0.069349		
Significance F	0.021091		