# Impact of Macroeconomic and Industry Specific Factors on Equity Market Returns: A Study of an Emerging Equity Market


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# Impact of Macro-Economic and Industry Specific Factors on Equity Market Returns: A Study of an Emerging Equity Market

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## FORWARDING SHEET

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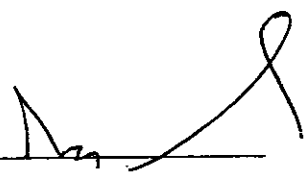
Signature: 

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IN THE NAME OF
ALLAH, THE MOST MERCIFUL AND BENEFICENT

*DEDICATED TO...*

"To my loving

**Parents**,

for their un-conditional love,

prayers, and support to make my dreams a reality."

## ABSTRACT

This study investigated the Arbitrage Pricing Model by using industry portfolio returns, macro economic variables (inflation, interest rate, money growth rate and foreign exchange rate) and industry specific variables (dividend yield and debt to equity ratio) in Pakistani stock market. This model will facilitate the investor to use Capital asset pricing Model for valuation of equity prices in KSE. It will also provide a smooth progress of implementation of Arbitrage pricing model instead of only CAPM. The purpose of this study is to explain the relationship of up stated variables by using monthly returns of 20 sectors of KSE 100 for the period of 01/2002 to 12/2009. Addition of industry specific variables (dividend premium and leverage premium) enhance the explanatory power of the capital asset pricing model for most of the sectors as far as macroeconomic variables have a very less significant impact in increasing the explanatory power of the model in most of the sectors except for interest rate and foreign exchange in some sectors.



**Keywords:** Emerging Equity Market, Macroeconomic Factors, Industry Specific Factors, Non Financial Sector

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No portion of the work, presented in this thesis, has been submitted in support of any application for any degree or qualification of this or any other university or institute of learning.

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# ABBREVIATIONS

| | |
|---|---|
| TB | Treasury bill |
| INF | Inflation |
| MP | Market Premium |
| LP | Leverage Premium |
| DP | Dividend Premium |
| FXR | Foreign Exchange Rate |
| MGR | Money Growth Rate |
| INT | Interest Rate |
| ME | Macroeconomic |

# CHAPTER-1: INTRODUCTION

The equity market is considered as an integral part which completes any countries financial system because it congregates up local resources and directs it to towards industrious investments. Therefore, with the above economic activity it has to be in a significant relationship with the economy, due to which equity pricing has been the core discussion issue in the magnificent area of finance over a couple of decades. A lot of work is compiled up in the form literature which led towards technical advancements in the area of finance but still there are a lot of gaps which are yet to be identified and yet to be resolved so there is still a lot of space for discussion, which would obviously lead toward better predictability models for equity prices. The most important advancement has been the capital asset pricing model (CAPM) which has been the most valuable and extensively discussed subject in finance. The basic theme and the background of CAPM leads to Henry Markowitz (1952) in which he gave the portfolio theory which gives investors perspective in the selection of portfolio which is associated with expected return and risk, the theory implies that how an investor can maximize its returns while mitigating the risk at the same time i:e a portfolio of different securities will help to reduce some risk of individual investment. The decrease in risk is due to the degree to which unpredictability in returns of individual investments move collectively. Due to this theory several questions aroused how this expected return and risk should be calculated which led toward the development of a model by Sharp (1964) in this model he initiated the concept of total risk which was divided in two types of risk one is systematic and the other is unsystematic risk it gave an uplift to the concept presented by Markowitz in his portfolio theory these advancements led to the development of CAPM which also included the similar contributions by Treynor (1961), Lintner (1965), Mossin (1966) and Black (1972).

Capital asset pricing model (CAPM) is basically used for valuation of different securities and stocks which are traded in stock market. Assets always have some amount of risk and some expected return is associated with it, the basic idea behind CAPM is that if there is a high anticipated risk the stakeholder would require a surplus return for the higher risk taken.

As time progressed some problems have emerged which are not explained by the CAPM, one of which is that CAPM assumes that the markets are efficient and follow the random walk theory which suggests that asset returns are normally distributed but as to real world phenomenon the markets aren't efficient and the returns are mostly not normally distributed. Capital asset pricing model determines variance as a tool for calculating risk but due to the above notion of returns not being normally distributed due to which it is not acceptable. CAPM does not explain the variation in stock returns. Myron Scholes, Michael Jensen and Fisher Black (1972) examined that those stocks having low beta might offer high returns than the model would forecast. These issues led to the development of models which could be better in predictability. Ross (1976) introduced Arbitrage Pricing Theory which implied that there is more than one factor which could affect expected returns rather than only market premium. The APT considers that every stock or asset return to the stake holder is affected by numerous independent factors. Apt has the ability to forecast a relationship among the returns of a portfolio and that of a single security through a linear combination of various independent company specific and macro economic variables.

Earlier empirical testing comprised of Black, Jensen and Scholes (1972), Fama and MacBeth (1973) and Blume and Friend (1973) supported the standard and zero beta model of CAPM. Subsequently Chen, Roll and Ross (1986) recognized variations in various macro economic variables such as inflation, GNP and variation in investor confidence due to variation in default premium in corporate bonds. Bhandari (1988) studied the relationship among debt equity ratio

and stock returns and came to conclusion that expected returns on common stock have positive association with the debt equity ratio. Shanken and Kothari (1996) and Lewellen (2004) studied the influence of financial ratios in predicating aggregate stock returns. It was found that there is a strong evidence that dividend yield predicts equity returns Muhammad & Rasheed (2003) found a significant association between exchange rates and stock markets in Pakistan & India, Wong, Khan and Du (2004) examined the long term and short term relationship between stock indices and macro economic variables (money supply and interest rate) of US and Singapore there is a long term association of equity prices with interest rate and money supply for Singapore but this does not apply to US. Humpe and Macmillan, (2007) found US stock prices were influenced negatively by inflation and the long term interest rate, Gay (2008) examined no significant relationship of exchange rate on stock market returns, Hasan and Javed (2008) found that change in exchange rate and T-Bill rate are considerable source of volatility in equity returns, Hasan and Javed (2009) found that exchange rate, inflation, money supply and T-Bill rates effect on equity returns.

A lot empirical testing has been done on various factors and CAPM but the basic theme of this research study is to test empirically the affect of industry and macroeconomic variables on sectored returns, different sectors such as cement, automobile, chemical, textile etc 20 sectors are undertaken. This study will cover the gap on the basis of sectors because its affect has never been tested on the Pakistani market specifically in case of the industry variables which are under took for testing, which will lead towards better understanding in the movements of stock prices.

## 1.2 Significance Statement

Apt is a model for an individual security or a portfolio to determine a theoretically appropriate required rate of return of an asset. Generally APT is used to calculate, cost of equity, making financing decisions, mergers and acquisition etc.

So, APT should cover all aspects regarding decision-making in various areas as discussed above. For that purpose other factors should be kept in mind while forecasting for these decisions. Fama and French (1992) found that on average, a portfolio's beta only explains about 70% of its actual returns and the remaining 30% is due to other factors. These, other factors must be identified to predict the expected returns.

## 1.3 Problem Statement

We want to investigate what are the effects of sectored returns of 20 sectors under taken on the industry specific variables leverage premium and dividend premium that either there is a significant relationship between these variables and up to how much extent it affects portfolio returns same to be tested regarding macro economic variables.

## 1.4 Objectives of Study

The purpose of the this study is to fill the gap in literature regarding Pakistani context to identify whether factors under taken for empirical testing have a significant relation in affecting the asset prices which will eventually help in portfolio evaluation, making financing decisions, valuation of stocks.

- Explain the relationship between leverage and sectored returns
- What is the relationship between dividend and sectored returns
- Identify the macro economic factors that influence sectored returns

- To facilitate the investor in pricing assets.
- To facilitate the investor in optimal resource allocation

## 1.5 Plan of Study

Chapter – 2 provides a brief overview of empirical work done in the developed and emerging markets.

Chapter – 3 deals with methodological issues. It provides information regarding data used in study, sources of data and statistical procedure used to investigate the data behavior.

Chapter – 4 consists of the results of the study and data analysis.

Finally chapter – 5 comprises of Conclusion and recommendations.

## CHAPTER-2: LITRATURE REVIEW

The significance of arbitrage pricing theory in the context with beta contradicted the capital asset pricing model (CAPM) of Sharpe (1964), Lintner (1965), and Black (1972) based on the mean-variance efficiency theory. However, the evidence might be steady and comparable with the given models of Merton and Robert (1973) and Breeden and Douglas (1979). APT assumes that security returns are related to various unidentified factors or variables. Therefore in the APT framework all investments have expected returns affected by macroeconomic factors which of these neither were mentioned in the early theory. These models proved that market return did not fully capture the relevant risk in the economy, and additional factors must be accounted for to explain expected returns. So CAPM does not explain every side of the picture.

Chen, Roll and Ross (1986) found that CAPM does not explain expected stock returns, a lot of other factors such as macro economic factors also were significant in explaining equity returns. They investigated the relationship of macroeconomic factors (Inflation, Treasury-bill rate, Long-term government bonds, Industrial production, low-grade bonds, equally weighted equities, Consumption and oil Prices) with equity returns of US equity market for the period of 1953-1983 by using Fama & McBeth (1973) two pass regression by taking monthly stock market prices. The results showed that industrial production, changes in the risk premium, twists in the yield curve had a significant impact in explaining expected stock returns. However, changes in oil price have no significant impact on expected stock returns.

He and Ng (1994) studied the macroeconomic variables, size in addition to book to market by means of monthly price in addition to returns data on nonfinancial, NYSE, AMEX, in addition to NASDAQ stocks, provided via the Center for Research in Security Prices (CRSP) at the University of Chicago. The sample period is from June 1958 up till December 1989 they subdivided the stocks into ten portfolios by using Fama & McBeth (1973) two pass regression

the variables used were the monthly growth rate of seasonally-adjusted industrial production led by one month, unanticipated inflation, the change in anticipated inflation, the difference among the monthly returns on long-term government bonds with one-month Treasury bills, the difference between the monthly returns corporate bonds and long-term government bonds, they primarily replicated the study conducted by CRR (Chen Roll & Ross 1986) and that they revealed the similar results as found out in the earlier research regarding the macroeconomic variables.

Poon and Taylor (1991) conducted a study as similar to Chen, Roll and Ross (1986) that examined the results in United Kingdom stocks. They used risk premium, inflation, monthly and yearly growth rate of industrial production, term structure of return on value weighted market index. The macroeconomic variables studied and empirically tested in this study did not affected the stock prices of United kingdom stock market in a same manner as reported in the Chen, Roll and Ross (1986). Cheng (1995) studied the monthly return data for 61 stocks of United Kingdom stock market. Findings of the study suggest that the descriptive power of APT in pricing UK stock market is not highly significant.

Bessler and Opfer (2004) conducted a study to explore the significance of different economic factors in elucidation of equity returns in Germany this study also examined whether the influence of economic factors was time varying. This study used macroeconomic variables under multi factor frame work. These variables were exchange rates, interest rates and term structure and study examined the behavior for the period from 1974 to 2000. The empirical outcomes verify that the factors used in this empirical study were significant in explaining equity returns particularly for banks. Moreover, it was evident that the explanatory power and the beta coefficients were time varying.

Lee (1992) conducted a study using of four variables i.e. inflation, stock returns, interest rates, growth in industrial production in VAR framework, for the period 1/1947 to 12/1987. The equity returns are the returns on the New York Stock Exchange (NYSE) value-weighted stock index, the results indicate that equity returns were negatively correlated with inflation and positively correlated with industrial production and interest rates.

Kaneko and Lee (1995) studied eight inflation and exchange rate and six other variables for the period 1975:01 to 1993:12 and reported that inflation and exchange rate can predict equity returns. Most of the variables indicate that japans excess returns are not easily predictable. Similar analysis was performed on the subsample period from 195:01 to 1984:12 and it was found that rate of change in exchange rate was the most important in predicting Japanese equity returns.

Martinez and Rubio (1989) studied relationship between macroeconomic variables and Spanish market return and reported that there were no considerable pricing association among stock returns and macroeconomic variables. Furthermore, the results suggested that multifactor APT with macroeconomic variables failed to elucidate the size effect in Spanish stock returns.

Gay (2008) examined the relationship between exchange rate, oil prices and stock market returns of Brazil, India, Russia and China by using the Box-Jenkins ARIMA model. This study used the data on monthly prices for 1999 – 2006 and found that there was no significant relationship between exchange rate and oil price and stock market price

Hasan and Javed (2008) studied the long-term dynamic relationship of monitory variables (money supply, treasury bill rates, foreign, exchange rates and the consumer price index) with Pakistani equity market by using Granger causality and multivariate co-integration the monitory variables for the period of 1998-2008. Analysis of this study revealed that the money growth rate, change in T-bill rate and change in exchange rate are significant sources of volatility in

equity returns. Monetary variables have a long-run as well as short-run relationship with equity returns. Hasan and Javed (2009) found that long term relationship exists among equity market and macroeconomic factors. They examined the long run casual relationship between macro economic factors and market equity returns using industrial production index, consumer price index, money supply, exchange rate and foreign portfolio investment as macro economic variables for the monthly data from 1998 to 2008 by using VAR frame work. Granger causality test indicates that T bill rates, exchange rates, inflation and money growth rate granger causes returns. Muhammad and Rasheed (2003) examined the long run relationship between exchange rates and equity prices by using co- integration technique data for the period of 1994-2000 on South Asian stock markets (Pakistan, India, Sir Lanka and Bangladesh). Results show that there is no relationship between equity markets and foreign exchange rates in Pakistan and India, but there is relationship between exchange rates and equity markets in Sri Lanka and Bangladesh.

Stavarek (2005) examines the existence of causal relationships among equity prices and effective exchange rates in Austria, France, Germany, the UK, Czech Republic, Hungary, Poland, Slovakia, and United States for the period 1970-2003. Results provide support regarding presence of unidirectional causality in the long run as well as short run. Results also signify that this causal relationship is stronger in developed markets, i.e., Austria, France, Germany, the UK, and US. Furthermore, the relationship is found stronger for the period 1993–2003 than 1970–92.

Wong, Khan and Du (2004) examined the long term and short term relationship between stock indices and macro economic variables (money supply and interest rate) of US and Singapore by using co-integration and Granger Causality techniques on the monthly data for the period of 1998-2002. Co-integration analysis suggests that there is a long run relationship between stock prices and interest rate and money supply in Singapore but this does not apply to US. To examine the results for a shorter period of time the period was divided into three sub periods.

Before the 1997 Asian crisis co-integration is observed interest and money supply and equity market returns but this decreased after the crisis. The same was the case for the US in 1987 Equity Crisis.

Humpe and Macmillan (2007) compared the US and Japan over the period January 1965 until June 2005 by the using of monthly data this study examined whether macroeconomic variables influence stock prices in the US and Japan. In US data there was an evidence of a single co-integration vector between stock prices, industrial production, inflation and the long term interest rate. US stock prices were influenced, as expected, positively by industrial production and negatively by inflation and the long term interest rate. However, money supply had an insignificant influence over the stock price. In Japan, stock prices were positively related to industrial production but negatively related to the money supply.

Virk (2009) focused on Finnish stock market and studied larger set of macro variables contributed by accounting market and macro time varying risks. Cross-sectional tests are proposed by Fama–MacBeth (1973) two pass regressions from 1988:04 to 2008:07 of 25 Finnish sectors, the macroeconomic variables used were term structure, exchange rate changes, unanticipated inflation rate, the results suggest that the term structure of interest rates is of significant value for predicting asset returns. Unanticipated inflation rate has an inverse relationship with asset returns aligning with the findings of Chen et al. (1986), Exchange rate positively influence returns during period of 1988:04 to 1998:07 and negatively influences during the period 1988:04 to 2008:07.

Nasseh and Strauss (2000) found out the existence of a significant, long-run relationship between stock prices and domestic and international economic activity (industrial production, business surveys of manufacturing orders, short- and long-term interest rates as well as foreign stock

prices, short-term interest rates and production) in six European economies. Quarterly data was used from 1962 to 1995 for France, Germany, Italy, Netherlands, Switzerland and the U.K. There was a strong, integrating relationship between stock prices and domestic and international macroeconomic variables in France, Germany, Italy, Netherlands, Switzerland and the U.K. Long-term interest rates are shown to negatively influence stock prices which is consistent with their role as a discount factor whereas, short-term interest rates are shown to be positively related to stock prices as they proxy for other real macroeconomic activity.

Bhandari (1988) examined the relationship between debt to equity ratio and common stock returns by using the Fama-MacBeth methodology on monthly data from 1948 to 1981. This period was further divided into two sub periods. The results showed that expected returns on common stock are positively related to the debt equity ratio.

There has been sizeable discussion in the current finance literature over the predictability of stock returns. a number of studies show to endow with empirical support for the use of the current dividend-price ratio, or dividend yield, as to determine anticipated stock returns. Rozeff (1984), Campbell and Shiller (1988a), Fama and French (1988), Hodrick (1992), and Nelson and Kim (1993), Shanken and Kothari (1996) studied the relationship between dividend yield and book to market and found that dividend yield relationship was stronger for the sub period of 1941-1991.

Shanken and Kothari (1996) tries to measure the time series variation in returns for 1926 to 1991 by using equally weighted and value weighted index by using the vector auto regressive framework (VAR) the results indicated that book to market relationship is significant for the period of 1926 to 1991 and dividend yield the relationship has significant relationship for the period of 1941-1991.

Lewellen (2004) studied the influence of financial ratios in predicating aggregate stock returns. For this purpose role of three financial ratios dividend yield, book to market and earnings price was examined. Dividend yield was calculated on the monthly value-weighted NYSE index for the period of 1946 to 2000. It was found that there is a strong evidence that dividend yield predicts both equal and value weighted NYSE returns for the period of 1946-2000. There was robust verification that dividend yield predicts both equal- and value-weighted NYSE returns in the above mentioned periods. In the full sample and various subsamples, Dividend yield is generally significant at the 0.001 level defining a strong significance.

Yao (2006) studied dividend yield and other economic variables which included money supply, inflation, exchange rate and interest rate role of these variables on equity returns was studied for the period of 1979 to 2000. This study found out a significant relationship between interest rate and equity returns, dividend yield was significant for four specific industries and exchange rate was only significant in case of financial sector also mentioning that interest rate, exchange rate and dividend yield were the most useful variables in predicting returns.

Fama and French 1992 found that on average, a portfolio's beta only explains about 70% of its actual returns and the remaining 30% is due to other factors. So, other factors must be identified to predict the expected returns. By identifying factors which influence expected returns will help in a much more solid base for predicting expected returns, for this purpose this research study is undertook to test empirically the affect of industry and macroeconomic variables on sectored returns, different sectors such as cement, automobile, chemical, textile etc 20 sectors are undertaken. This study will cover the gap on the basis of sectors because its affect has never been tested on the Pakistani market specifically in case of the industry variables which are under took for testing, which will lead towards better understanding in the movements of stock price.

## 2.1 Hypothesis

**$H_1$:** There is a significant relationship between market premium and equity returns KSE.

**$H_2$:** There is a significant relationship between Foreign Exchange, Interest Rate, Money Supply, Inflation and equity returns KSE.

**$H_3$:** There is a significant relationship between Leverage, Dividend Factors and equity returns

# CHAPTER-3: RESEARCH METHODOLOGY

This study is based on the sector wise analysis, which consists of 20 different sectors, all these sectors have their own importance as to Pakistans economic context a brief introduction is given for all the sectors as to how they contribute in Pakistan's economy.

The cement industry of Pakistan penetrated the overseas markets some years ago, and has made its goodwill as a quality product. The cement sector is adding Rs 30 billion to the government in the form of taxes. Cement sector has put in about Rs 100 billion in capacity development over the last four years. There are four overseas companies, three military companies and 16 private companies listed in the stock exchanges. The industry is divided into two wide parts, the northern part of the country and the southern part. The northern part contributes an 87% share in the overall cement sales while the southern part of the country adds 13% of the yearly cement trade. Same as above the automotive industry has its own importance.

Automobile Part Sector home-grown technical resources and technological connections with famous international corporations, the auto parts sector has by and large developed into an established sector of the country. Next to being organized, a considerable number of little and big units (around 1200) are working in un-organized sector. In detail, 90% of automotive parts business comprises of Small and Medium sized Enterprises (SMEs), out of which about 95% are on ownership basis

The automotive assembling industry is an essential part of the economy in any country as it relates many businesses and services. Manufacturing of a transport vehicle integrates all probable industrial activities. This provides a strategic benefit and permanence to the local parts manufacturing businesses, which in turn widens their abilities in their particular fields

The chemical industry is an important agent in the economic growth of any country. Pakistan's chemical industry mostly has established on a fragmented and unplanned basis, encouraged by a mixture of the existence of a petite local market and usually high tariffs. The manufacturing of pesticides and dye are mainly based on imported base materials and the domestic value addition is limited to preparation and packing.

The pharmaceutical industry in Pakistan also plays a vital part in the economic growth of the country by making sure that people are healthier through supplying low-priced and quality medicine. The total manufacturing and usage of pharmaceuticals is currently predicted at $2.0 billion. The number of pharmaceutical manufacturing companies is 316 which constitutes of 30 multinationals having a 47% share, and 80% of the pharmaceutical demand of the country is being met by these companies. Approximately 95% of the basic raw materials used for production of medicines are traded in from China, India, Japan, Germany, Netherlands and others. Other production inputs, i.e. technology, labor, packaging materials

The Jute industry plays an integral part in agriculture and economic sectors of Pakistan. The jute sector of Pakistan creates direct job opportunities to more than 25,000, and indirect assistance to 100,000 people. Jute sector has just begun to export its commodities and also has managed to establish good quality suppliers in Iran, Egypt, Sudan, United Kingdom and UAE. Jute sector is reaching new horizons by creating cliental in many continents of the world such as Asia, Africa and Europe.

Leather manufacturing which constitutes of leather goods is the second major export earning sector after textiles. At present, Leather Industry is adding around $800 million annually but has the capability to increase quantity of exports with the enhancement of quality and expand its different range of goods, particularly garments and footwear. This sector is not only important

for earning foreign exchange for the country but it also provides with job opportunities to a large group of people.

Oil and Gas sector has a significant importance in Pakistan and as it has seen extraordinary increase while the independence in 1947 when the capacity in which oil produced was inadequate. Over the last five decades the petroleum sector has performed an integral part in national growth by making big local gas discoveries.

Power Generation and Distribution Sector fulfills the majority needs of the nation by thermal resources which is approximately 65 percent. Due to a mild scarcity of natural gas in the country, lower in value of the domestic coal, and lesser water levels in rivers; most accessible and imminent thermal power projects are furnace oil based, which is the most costly mean of electricity production in Pakistan

There has been a constant increase in the use of energy commodities despite the fact the installed capability to refine oil has remained sluggish. This ever increasing need of energy products in the country is mostly dependent on imports. As for Pakistan is enjoying a friendly association with the Middle Eastern countries and is continuously importing most of its supplies from Kuwait and Saudi Arabia.

The Sugar sector has an integral role in the economic environment in Pakistan. After textile sector it is the second biggest sector of Pakistan. In 1947, there were merely two sugar plants in the country. The production of these factories was not adequate for fulfilling the household necessities Due to this import of sugar from other countries was started and a lot of foreign exchange was used up on this item. It adds approximately 4 billion Rs in the form of excise duty and other taxes to the Government are also of vital significance.

The textile sector enjoys an essential place in the export of Pakistan. Our country is the 8th biggest exporter of textile goods in Asia. Textile sector contributes 8.5 percent in the Gross Domestic Product of the country. The per year amount of entire world textile trade is 18 trillion US dollars which is increasing at a growth rate of 2.5%. Pakistan has only 1% of this share.

Tobacco industry constitutes of plantation, manufacturing, supplying and retailing added 4.4 % or approximately Rs 27.5 billion to the total Gross Domestic Product of Pakistan. After cotton and yarn it is the only largest contributor of excise duty which is six times that of cotton and yarn industries

Transport sector has four segments in Pakistan road transport, ports, railway and airports there are 14 dry ports. There are 36 working airports in the country most of the local and global cargo is handled by three major airports which are Karachi, Lahore and Islamabad. The transportation sector contributes about 10.5 % of the country's GDP. It is responsible for approximately 6 % of employment in the country. Government agencies control the sector.

For the past three years Information Technology & Telecomm sector is growing progressively. A noticeable boost in software export statistics are a sign of this flourishing industry's worth. This sector has become quite attractive for foreign direct investment due to which in the last four years 9 billion dollars have been invested in shape of foreign investments.

### 3.1 Sample and Data Collection

This study examines the relationship between macroeconomic variables and equity returns of 20 non-financial sectors for the period 1/2002 to 12/2009. Only non-financial sectors are selected for this study as financial and non financial firms having different financial structures (Fama and French 1992). Although the findings can be extended to Islamabad and Lahore Stock exchange

as well as to international stock exchanges but the current study is solely based on (KSE). The reason behind the selection of KSE is that KSE is the true representative of stock markets in Pakistan. This study is based on secondary data. For the purpose of data collection different websites of KSE, Business Recorder and state bank of Pakistan are used Stock prices data is taken from Karachi Stock Exchange (KSE) and Business recorder. The treasury-bill rate is used as risk free rate and KSE 100 Index as the return rate of market. The data on treasury-bill rates are taken from Monthly Bulletin of State Bank of Pakistan. All these are well know and reliable source of business information in Pakistan.

**Table – 4.1: Number of companies according to Debt-to-Equity Ratio and Dividend Yield for the years 2002 to 2009:**

| Year | 2002 | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 |
|---|---|---|---|---|---|---|---|---|
| DTE | 371 | 340 | 348 | 362 | 370 | 368 | 350 | 346 |
| DY | 294 | 278 | 282 | 288 | 300 | 294 | 350 | 346 |

### 3.2 Measures

In order to construct the industry specific and macroeconomic variables following procedure was used.

#### 3.2.1 Equity Returns

Equity Returns will be calculated by using continuously compounded annual rate of return is calculated by using:

$$R_t = \text{Ln}\,(P_t / P_{t-1})$$

Where,

Ln = Natural log

$P_t$ = Closing value of share on Month '$t$'

$P_{t-1}$ = Closing value of share on Month '$t-1$'

Where $P_t$ and $P_{t-1}$ are closing prices on month t and t-1 respectively.

### 3.2.2 Debt Equity Ratio*

Debt to equity ratio is calculated by dividing total liabilities by shareholders equity.

$$\textit{Debt to Equity Ratio} = \frac{\text{Total Liabilities}}{\text{Shareholders' Equity}}$$

### 3.2.3 Dividend Yield**

First of all, dividend yield of all firms is calculated. Dividend yield is calculated by dividing total amount of dividend by shareholders equity. This data is collected at the end of June of every year.

$$\textit{Dividend Yield} = \frac{\text{Total Amount of Dividend}}{\text{Shareholders' Equity}}$$

### 3.2.4 Foreign Exchange Rate

Foreign exchange rate is measured by employing end of month US$/Rs exchange rate and change in value is worked out through log difference i.e

$$\textit{Change in foreign Exchange Rate} = \ln (FERt / FERt\text{-}1)$$

Where FER is foreign exchange rate US $/Rs

***Debt-to-Equity data has been obtained from *Balance Sheet Analysis Files* provided by state bank of Pakistan**

****Dividend Yield data has been obtained from *Balance Sheet Analysis Files* provided by state bank of Pakistan**

### 3.2.5 Interest Rate

Treasury bill rates have been used as proxy of Interest rate. Change in interest rate has been measured by using log difference to T bill rates.

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

### 3.2.6 Money Supply

Broad Money (M1) is used as a proxy of money supply. Money growth rate has been calculated by using log difference of broad money (M2)

$$\textit{Money growth rate} = \ln (Mt / Mt\text{-}1)$$

### 3.2.7 Inflation Rate

Consumer Price Index is used as a proxy of inflation rate. CPI is chosen as it is a broad base measure to calculate average change in prices of goods and services during a specific period.

$$\textit{Inflation Rate} = \ln (CPIt / CPIt\text{-}1)$$

### 3.2.8 Portfolio Construction

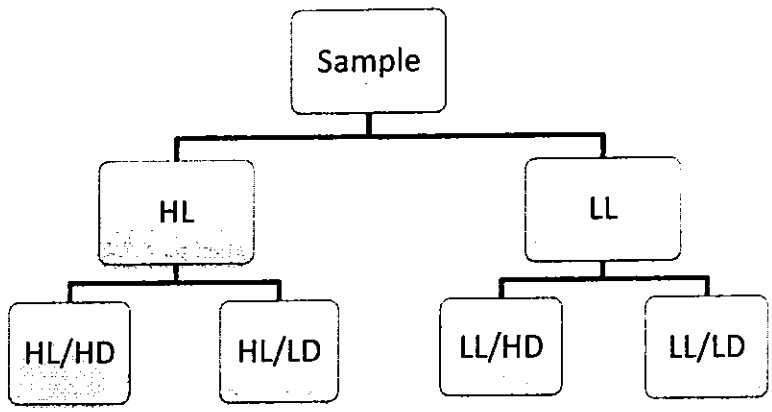
After obtaining the data for debt-to-equity ratio and dividend yield as mentioned above, in the second step these companies were sorted according to the companies having the highest debt/equity ratio to the companies having low debt/equity ratio each year for the period mentioned above, In third step the companies were divided into two groups high (companies

with highest debt/equity ratio) and low (companies with low debt/equity ratio), companies with negative equity were removed. By this two portfolios HL (high leverage) and LL (low leverage) were formed for each year.

In the third step the companies in both HL and LL portfolios were further sorted according to the dividend yield ratio these companies were sorted in further two sub portfolios separately for HL and LL i.e. the companies in HL were divided in to two sub portfolios HD (companies paying high dividend) and LD (companies paying low dividend or zero dividend) these portfolios were named HL/HD ( consists of companies having high leverage and high dividend) and HD/LD (companies having high leverage and low dividend)

Similarly in LL companies were dividend in to two sub portfolios HD (companies paying high dividend) and LD (companies paying low dividend or zero dividend) these portfolios were named LL/HD (consists of companies having low leverage and high dividend) and HD/LD (companies having low leverage and low dividend) figure below illustrates,

***Figure 1 Portfolio Construction***



In the fourth step returns for all the companies in these four portfolios were calculated by using natural log Ln ($P_t / P_{t-1}$) for monthly data and then average returns for each year on monthly basis was calculated for each portfolio **HL/HD, HL/LD, LL/HD** and **LL/LD** which led towards the calculation of leverage premium and dividend premium. To isolate the factor premiums from each other, the two factors are constructed as zero investment portfolios from four sub portfolios as under.

$$\textit{Leverage Premium} = 1/2\{(HL/HD - LL/HD) + (HL/LD - LL/LD)\}$$

$$\textit{Dividend Premium} = 1/2\{(HL/HD - HL/LD) + (LL/HD - LL/LD)\}$$

### 3.2.9 Econometric Model:

$$\mathbf{R_{if}} = R_f + \beta_1 (MP) + \beta_2 (LP) + \beta_3 (DP) + \beta_4 (FXR) + \beta_5 (INF) + \beta_6 (MGR) + \beta_7 (INT)$$

Where,

*Rif* = Return to Security *i*
$R_f$ = Risk Free Rate
MP = Market Premium
LP = Leverage Premium
DP = Dividend Premium
FXR = Foreign Exchange Rate
INF = Inflation
MGR = Money Growth Rate
INT = Interest Rate

## CHAPTER4: DATA ANALYSIS AND DISCUSSIONS

The descriptive statistics of time series for the period 2002-2009 is given below in Table-4.2 according to 20 different sectors.

**Table – 4.2: Descriptive statistics Return of Portfolio for All Sectors for the period of 2002-2009:**

| Sectors | Mean | Standard Deviation | Kurtosis | Skewness | Minimum | Maximum |
|---|---|---|---|---|---|---|
| Cement | 0.003 | 0.130 | 3.056 | 0.557 | -0.365 | 0.552 |
| Automobile Parts | 0.010 | 0.089 | 0.057 | 0.147 | -0.183 | 0.253 |
| Automobile Assembler | 0.013 | 0.107 | 0.008 | 0.268 | -0.199 | 0.300 |
| Cable and electrical goods | 0.015 | 0.103 | 1.262 | 0.728 | -0.232 | 0.343 |
| chemicals | 0.004 | 0.078 | 0.931 | 0.491 | -0.162 | 0.243 |
| Pharmaceuticals | 0.013 | 0.071 | 0.947 | 0.416 | -0.145 | 0.270 |
| Food and personal care products | 0.012 | 0.068 | 3.806 | -0.571 | -0.269 | 0.201 |
| Jute | 0.019 | 0.117 | 1.472 | 0.716 | -0.316 | 0.390 |
| Leather and Tanneries | 0.013 | 0.097 | 0.865 | 0.582 | -0.184 | 0.329 |
| Misc | 0.013 | 0.084 | 1.103 | 0.370 | -0.232 | 0.274 |
| Oil & Gas Market | 0.016 | 0.092 | 2.081 | -0.181 | -0.268 | 0.330 |
| Power Generation & Distribution | 0.004 | 0.105 | 2.179 | -0.031 | -0.355 | 0.377 |
| Refinery | 0.012 | 0.144 | 3.449 | -0.996 | -0.580 | 0.342 |
| Oil & Gas Exploration Companies | 0.043 | 0.142 | 3.191 | 0.297 | -0.453 | 0.557 |
| Sugar Allied industries | 0.012 | 0.077 | 1.574 | 0.604 | -0.154 | 0.298 |
| Textile Spinning | 0.001 | 0.076 | 1.068 | 0.763 | -0.160 | 0.221 |
| Tobacco | 0.025 | 0.120 | 0.761 | 0.035 | -0.284 | 0.354 |
| Transport | 0.026 | 0.143 | 3.216 | 0.915 | -0.318 | 0.613 |
| Technology and Communication | 0.013 | 0.143 | 10.199 | 1.541 | -0.485 | 0.711 |
| Woollen | 0.002 | 0.134 | 13.306 | -1.075 | -0.756 | 0.586 |
| Market Return | 0.020 | 0.092 | 6.360 | -1.473 | -0.449 | 0.241 |

Table 4.2 represents the behavior of sectored returns all twenty sectors. It shows that standard deviation is 13%, 14.4%, 14.2%, 14.3%, 14.3% and 13.4% for cement, refinery, oil and gas exploration, transport, Technology Communication and woolen sectors respectively which indicates that volatility is high. From minimum and maximum it can be inferred that highest returns in this all the twenty sectors is sector is 71% and the highest figure for loss is 75%.

Skewness indicates that returns are negatively skewed for food and personal care products, oil and gas market, power generation distribution, refinery and woolen sector for the remaining sectors skewness indicates that returns are positively skewed. If Kurtosis is 3 then normal-distribution returns is mesokurtic. If kurtosis is >3 then pattern is leptokurtic and that are associated with simultaneously "peaked" and fat tail. But when kurtosis is less than 3 it is called paltykurtic and that are associated with simultaneously "less peaked" and have "thinner tail" The figures in table 4.2 for kurtosis is < 3 which means it paltykurtic for all sectors other than cement, food and personal care products, oil and gas market, transport, technology and communication and woolen sector for which kurtosis is > 3 which means it is leptokurtic. As for market returns standard deviation is 9.2% which indicates that volatility is high. From minimum and maximum it can be inferred that highest returns in this sector is 24% and the highest figure for loss is 44%. Skewness indicates that returns are negatively skewed for market returs. Kurtosis is > 3 which means it leptokurtic

**Table – 4.3: Descriptive statistics Industry specific and Macroeconomic variables for the period of 2002-2009:**

| *Variables* | *Mean* | *Standard Deviation* | *Kurtosis* | *Skewness* | *Minimum* | *Maximum* |
|---|---|---|---|---|---|---|
| Market Premium | 0.591 | 0.347 | -0.458 | -0.073 | -1.616 | 0.044 |
| Leverage Premium | 0.003 | 0.029 | 1.504 | 0.108 | -0.100 | 0.074 |
| Dividend Premium | 0.002 | 0.037 | 5.033 | 0.006 | -0.140 | 0.160 |
| F X Rate | 0.003 | 0.012 | 9.082 | -2.259 | -0.063 | 0.035 |
| Inflation | 0.007 | 0.008 | 0.833 | 0.672 | -0.009 | 0.033 |
| Money Growth M1 | 0.016 | 0.054 | 65.557 | 7.420 | -0.062 | 0.491 |
| Interest Rate | 0.004 | 0.101 | 5.186 | -1.060 | -0.423 | 0.311 |

Table 4.3 represents the statistical behavior of market premium, leverage premium, dividend premium and four macroeconomic variables. It shows that standard deviation is 34% and 10 %

for market premium and interest rate. The data for all the variables is positively skewed except for market premium, foreign exchange rate and interest rate. The data for all the variables has a kurtosis >3 which means it is leptokurtic except market premium which has ketosis <3 which means it is paltykurtic.

**Table – 4.4: Correlation Matrix for the period of 2002-2009:**

| | *Market Premium* | *Leverage Premium* | *Dividend Premium* | *Interest Rate* | *F X Rate* | *Inflation* | *Money Growth Rate* |
|---|---|---|---|---|---|---|---|
| Market Premium | 1 | | | | | | |
| Leverage Premium | 0.336 | 1 | | | | | |
| Dividend Premium | -0.353 | -0.596 | 1 | | | | |
| Interest Rate | 0.614 | -0.137 | 0.132 | 1 | | | |
| F X Rate | -0.315 | -0.021 | 0.121 | -0.73 | 1 | | |
| Inflation | 0.114 | -0.082 | -0.248 | 0.141 | 0.297 | 1 | |
| Money Growth M1 | -0.535 | -0.047 | 0.096 | -0.465 | 0.352 | 0.223 | 1 |

The Table-4.4 shows that there are negative and positive correlation for all portfolios, market premium is negatively correlated to dividend premium foreign exchange rate and money growth rate the industry factors of leverage premium and dividend premium does not and no multicolinearity is found so we can go further for our analysis and incorporate all these variables in our proposed model.

**Table – 4.5: Regression Analysis of Cement Sector: Market Premium, Industry Specific and Macroeconomic Factors for the period of 2002-2009**

| RP1 Cement | Model 1 | Model 2 | Model 3 | Model 4 | Model 5 | Model 6 | Model 7 |
|---|---|---|---|---|---|---|---|
| **INTERCEPT** | 0.09 | 0.08 | 0.08 | 0.07 | 0.06 | 0.07 | 0.07 |
| *t Stat* | 3.64 | 3.45 | 3.31 | 3.07 | 2.31 | 2.51 | 2.38 |
| *P-value* | 4.07 | 0.00 | 0.00 | 0.00 | 0.02 | 0.01 | 0.02 |
| **RM-RF** | 0.14 | 0.13 | 0.12 | 0.11 | 0.11 | 0.12 | 0.11 |
| *t Stat* | 4.07 | 3.67 | 3.47 | 2.86 | 2.91 | 3.05 | 2.98 |
| *P-value* | 0.04 | 0.00 | 0.00 | 0.01 | 0.00 | 0.00 | 0.00 |
| **LEVERAGE PREMIUM** | | 0.85 | 0.48 | 0.55 | 0.55 | 0.47 | 0.39 |
| *t Stat* | | 2.02 | 1.09 | 1.23 | 1.22 | 1.03 | 0.84 |
| *P-value* | | 0.05 | 0.28 | 0.22 | 0.22 | 0.30 | 0.40 |
| **DIVIDEND PREMIUM** | | | -0.80 | -0.80 | -0.90 | -0.91 | -0.93 |
| *t Stat* | | | -2.26 | -2.27 | -2.50 | -2.53 | -2.59 |
| *P-value* | | | 0.03 | 0.03 | 0.01 | 0.01 | 0.01 |
| **F X Rate** | | | | 0.97 | 1.91 | 1.86 | 1.92 |
| *t Stat* | | | | 0.91 | 1.50 | 1.46 | 1.50 |
| *P-value* | | | | 0.36 | 0.14 | 0.15 | 0.14 |
| **INFLATION** | | | | | 2.40 | 2.30 | 2.62 |
| *t Stat* | | | | | 1.33 | 1.27 | 1.42 |
| *P-value* | | | | | 0.19 | 0.21 | 0.16 |
| **MONEY GROWTH M1** | | | | | | -0.24 | -0.24 |
| *t Stat* | | | | | | -1.04 | -1.07 |
| *P-value* | | | | | | 0.30 | 0.29 |
| **INTEREST RATE** | | | | | | | -0.12 |
| *t Stat* | | | | | | | -0.95 |
| *P-value* | | | | | | | 0.35 |
| **F Statistics** | 16.54 | 10.58 | 9.07 | 7.00 | 6.00 | 5.19 | 4.57 |
| **F-sig** | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| **Adjusted R Square** | 0.14 | 0.17 | 0.20 | 0.20 | 0.21 | 0.21 | 0.21 |

Above Table-4.5 indicates that CAPM is a valid model in Pakistan because market premium is significant positively related to portfolio returns. However explanatory power of model is reasonably low for cement sector as evident from adjusted $R^2$ which is 14% only it indicates that possibility of others explanatory variables should be explored. Additions of leverage premium in conventional CAPM improve the explanatory power marginally above table 4.5 shows that in

Pakistan Leverage Premium is priced. Similarly Dividend Premium is significantly negatively influencing the returns. It is according to economic rational as when dividend is distributed amount available for reinvestment is decreased which slow down the growth rate. However macroeconomic variable are not significantly influencing the returns of cement industry it may be noted that explanatory power slightly improved by incorporation of macroeconomic variable.

**Table – 4.6: Regression Analysis of Automobile Parts Sector: Market Premium, Industry Specific and Macroeconomic Factors for the period of 2002-2009**

| RP2 Automobile Parts | Model 1 | Model 2 | Model 3 | Model 4 | Model 5 | Model 6 | Model 7 |
|---|---|---|---|---|---|---|---|
| **INTERCEPT** | 0.07 | 0.07 | 0.06 | 0.06 | 0.06 | 0.07 | 0.07 |
| *t Stat* | 4.14 | 3.96 | 3.86 | 3.49 | 3.24 | 3.61 | 3.44 |
| *P-value* | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| **RM-RF** | 0.10 | 0.09 | 0.09 | 0.07 | 0.07 | 0.08 | 0.08 |
| *t Stat* | 4.08 | 3.72 | 3.57 | 2.67 | 2.66 | 2.92 | 2.84 |
| *P-value* | 0.00 | 0.00 | 0.00 | 0.01 | 0.01 | 0.00 | 0.01 |
| **LEVERAGE PREMIUM** | | 0.51 | 0.39 | 0.48 | 0.48 | 0.39 | 0.32 |
| *t Stat* | | 1.75 | 1.24 | 1.54 | 1.53 | 1.25 | 1.01 |
| *P-value* | | 0.08 | 0.22 | 0.13 | 0.13 | 0.22 | 0.32 |
| **DIVIDEND PREMIUM** | | | -0.26 | -0.27 | -0.26 | -0.27 | -0.30 |
| *t Stat* | | | -1.06 | -1.10 | -1.04 | -1.10 | -1.19 |
| *P-value* | | | 0.29 | 0.28 | 0.30 | 0.27 | 0.24 |
| **F X Rate** | | | | 1.31 | 1.24 | 1.20 | 1.24 |
| *t Stat* | | | | 1.77 | 1.40 | 1.35 | 1.41 |
| *P-value* | | | | 0.08 | 0.17 | 0.18 | 0.16 |
| **INFLATION** | | | | | -0.16 | -0.27 | 0.01 |
| *t Stat* | | | | | -0.13 | -0.22 | 0.01 |
| *P-value* | | | | | 0.90 | 0.83 | 0.99 |
| **MONEY GROWTH M1** | | | | | | -0.26 | -0.27 |
| *t Stat* | | | | | | -1.66 | -1.70 |
| *P-value* | | | | | | 0.10 | 0.09 |
| **INTEREST RATE** | | | | | | | -0.10 |
| *t Stat* | | | | | | | -1.23 |
| *P-value* | | | | | | | 0.22 |
| **F Statistics** | 16.63 | 10.03 | 7.07 | 6.21 | 4.92 | 4.64 | 4.21 |
| **F-sig** | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| **Adjusted R Square** | 0.14 | 0.16 | 0.16 | 0.18 | 0.17 | 0.19 | 0.19 |

Above Table-4.6 indicates that CAPM is a valid model in Pakistan because market premium is significant positively related to portfolio returns. However explanatory power of model is reasonably low for automobiles parts sector as evident from adjusted $R^2$ which is 14% only it indicates that possibility of others explanatory variables should be of leverage premium in conventional CAPM improves the explanatory power marginally table 4.6 shows that in Pakistan Leverage Premium is priced. Similarly Dividend Premium is insignificantly influencing the returns. However macroeconomic variable are not significantly influencing the returns of automobiles parts industry it may be noted that explanatory power slightly improved by incorporation of macroeconomic variable.

**Table – 4.7: Regression Analysis of Automobile Assembler Sector: Market Premium, Industry Specific and Macroeconomic Factors for the period of 2002-2009**

| RP3 Automobile Assembler | Model 1 | Model 2 | Model 3 | Model 4 | Model 5 | Model 6 | Model 7 |
|---|---|---|---|---|---|---|---|
| **INTERCEPT** | 0.10 | 0.09 | 0.09 | 0.08 | 0.08 | 0.09 | 0.08 |
| *t Stat* | 5.04 | 4.86 | 4.75 | 4.33 | 3.78 | 4.30 | 4.09 |
| *P-value* | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| **RM-RF** | 0.14 | 0.13 | 0.12 | 0.10 | 0.10 | 0.11 | 0.11 |
| *t Stat* | 5.05 | 4.65 | 4.46 | 3.36 | 3.36 | 3.73 | 3.65 |
| *P-value* | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| **LEVERAGE PREMIUM** | | 0.69 | 0.42 | 0.55 | 0.55 | 0.43 | 0.31 |
| *t Stat* | | 2.07 | 1.20 | 1.59 | 1.58 | 1.24 | 0.88 |
| *P-value* | | 0.04 | 0.23 | 0.11 | 0.12 | 0.22 | 0.38 |
| **DIVIDEND PREMIUM** | | | -0.59 | -0.59 | -0.62 | -0.64 | -0.67 |
| *t Stat* | | | -2.10 | -2.17 | -2.21 | -2.32 | -2.48 |
| *P-value* | | | 0.04 | 0.03 | 0.03 | 0.02 | 0.01 |
| **F X Rate** | | | | 1.89 | 2.14 | 2.07 | 2.16 |
| *t Stat* | | | | 2.29 | 2.15 | 2.12 | 2.24 |
| *P-value* | | | | 0.02 | 0.03 | 0.04 | 0.03 |
| **INFLATION** | | | | | 0.64 | 0.48 | 0.98 |
| *t Stat* | | | | | 0.45 | 0.35 | 0.70 |
| *P-value* | | | | | 0.65 | 0.73 | 0.48 |
| **MONEY GROWTH M1** | | | | | | -0.37 | -0.38 |
| *t Stat* | | | | | | -2.12 | -2.21 |
| *P-value* | | | | | | 0.04 | 0.03 |
| **INTEREST RATE** | | | | | | | -0.18 |
| *t Stat* | | | | | | | -1.94 |
| *P-value* | | | | | | | 0.06 |
| **F Statistics** | 25.53 | 15.36 | 12.08 | 10.80 | 8.60 | 8.20 | 7.78 |
| **F-sig** | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| **Adjusted R Square** | 0.21 | 0.23 | 0.26 | 0.29 | 0.29 | 0.31 | 0.33 |

Above Table-4.7 indicates that CAPM is a valid model in Pakistan because market premium is significant positively related to portfolio returns. However explanatory power of model is reasonably low for Automobile Assembler sector as evident from adjusted $R^2$ which is 21% only it indicates that possibility of others explanatory variables should be of leverage premium in conventional CAPM improve the explanatory power marginally above table shows that in

Pakistan Leverage Premium is priced. Similarly Dividend Premium is significantly negatively influencing the returns. It is according to economic rational as when dividend is distributed amount available for reinvestment is decreased which slow down the growth rate. However macroeconomic variable foreign exchange rate, money growth rate and interest rate are significantly influencing the returns of automobiles parts industry as far as inflation has no significant impact on the returns of Automobile Assembler industry it may be noted that explanatory power slightly improved by incorporation of macroeconomic variable.

**Table – 4.8: Regression Analysis of Cable & Electric Sector: Market Premium, Industry Specific and Macroeconomic Factors for the period of 2002-2009**

| RP4 Cable & electric | Model 1 | Model 2 | Model 3 | Model 4 | Model 5 | Model 6 | Model 7 |
|---|---|---|---|---|---|---|---|
| **INTERCEPT** | 0.07 | 0.07 | 0.07 | 0.06 | 0.07 | 0.07 | 0.07 |
| *t Stat* | 3.77 | 3.62 | 3.48 | 3.10 | 3.12 | 3.28 | 3.15 |
| *P-value* | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| **RM-RF** | 0.10 | 0.09 | 0.09 | 0.06 | 0.06 | 0.07 | 0.07 |
| *t Stat* | 3.48 | 3.18 | 2.97 | 2.07 | 2.04 | 2.18 | 2.11 |
| *P-value* | 0.00 | 0.00 | 0.00 | 0.04 | 0.04 | 0.03 | 0.04 |
| **LEVERAGE PREMIUM** | | 0.46 | 0.17 | 0.28 | 0.28 | 0.22 | 0.17 |
| *t Stat* | | 1.33 | 0.45 | 0.77 | 0.78 | 0.60 | 0.45 |
| *P-value* | | 0.19 | 0.65 | 0.44 | 0.44 | 0.55 | 0.65 |
| **DIVIDEND PREMIUM** | | | -0.64 | -0.65 | -0.61 | -0.62 | -0.63 |
| *t Stat* | | | -2.20 | -2.26 | -2.07 | -2.10 | -2.14 |
| *P-value* | | | 0.03 | 0.03 | 0.04 | 0.04 | 0.03 |
| **F X Rate** | | | | 1.66 | 1.25 | 1.21 | 1.25 |
| *t Stat* | | | | 1.91 | 1.20 | 1.17 | 1.20 |
| *P-value* | | | | 0.06 | 0.23 | 0.25 | 0.23 |
| **INFLATION** | | | | | -1.05 | -1.13 | -0.91 |
| *t Stat* | | | | | -0.71 | -0.76 | -0.60 |
| *P-value* | | | | | 0.48 | 0.45 | 0.55 |
| **MONEY GROWTH M1** | | | | | | -0.18 | -0.19 |
| *t Stat* | | | | | | -0.99 | -1.01 |
| *P-value* | | | | | | 0.32 | 0.31 |
| **INTEREST RATE** | | | | | | | -0.08 |
| *t Stat* | | | | | | | -0.77 |
| *P-value* | | | | | | | 0.44 |
| **F Statistics** | 12.14 | 7.00 | 6.47 | 5.91 | 4.80 | 4.16 | 3.64 |
| **F-sig** | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| **Adjusted R Square** | 0.10 | 0.11 | 0.15 | 0.17 | 0.17 | 0.17 | 0.16 |

Above Table-4.8 indicates that CAPM is a valid model in Pakistan because market premium is significant positively related to portfolio returns. However explanatory power of model is reasonably low for Cable and electrical goods sector as evident from adjusted $R^2$ which is 10% only it indicates that possibility of others explanatory variables should be of leverage premium in conventional CAPM improve the explanatory power marginally above table 4.8 shows that in

Pakistan Leverage Premium is not priced. Similarly Dividend Premium is significantly negatively influencing the returns. It is according to economic rational as when dividend is distributed amount available for reinvestment is decreased which slow down the growth rate. However macroeconomic variable are not significantly influencing the returns of Cable and electrical goods industry it may be noted that explanatory power slightly improved by incorporation of macroeconomic variable.

**Table – 4.9: Regression Analysis of Chemicals Sector: Market Premium, Industry Specific and Macroeconomic Factors for the period of 2002-2009**

| RP5 chemicals | Model 1 | Model 2 | Model 3 | Model 4 | Model 5 | Model 6 | Model 7 |
|---|---|---|---|---|---|---|---|
| **INTERCEPT** | 0.06 | 0.06 | 0.05 | 0.05 | 0.04 | 0.05 | 0.05 |
| *t Stat* | 4.42 | 4.24 | 4.13 | 3.78 | 3.06 | 3.36 | 3.12 |
| *P-value* | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| **RM-RF** | 0.10 | 0.09 | 0.08 | 0.07 | 0.07 | 0.07 | 0.07 |
| *t Stat* | 4.78 | 4.32 | 4.12 | 3.25 | 3.28 | 3.50 | 3.44 |
| *P-value* | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| **LEVERAGE PREMIUM** | | 0.72 | 0.48 | 0.54 | 0.54 | 0.48 | 0.35 |
| *t Stat* | | 3.03 | 1.92 | 2.17 | 2.17 | 1.91 | 1.43 |
| *P-value* | | 0.00 | 0.06 | 0.03 | 0.03 | 0.06 | 0.16 |
| **DIVIDEND PREMIUM** | | | -0.54 | -0.54 | -0.58 | -0.59 | -0.63 |
| *t Stat* | | | -2.71 | -2.76 | -2.91 | -2.97 | -3.29 |
| *P-value* | | | 0.01 | 0.01 | 0.00 | 0.00 | 0.00 |
| **F X Rate** | | | | 0.93 | -0.58 | 1.32 | 1.41 |
| *t Stat* | | | | 1.58 | 1.90 | 1.87 | 2.07 |
| *P-value* | | | | 0.12 | 0.06 | 0.07 | 0.04 |
| **INFLATION** | | | | | 1.08 | 1.00 | 1.52 |
| *t Stat* | | | | | 1.07 | 1.00 | 1.56 |
| *P-value* | | | | | 0.29 | 0.32 | 0.12 |
| **MONEY GROWTH M1** | | | | | | -0.18 | -0.19 |
| *t Stat* | | | | | | -1.45 | -1.60 |
| *P-value* | | | | | | 0.15 | 0.11 |
| **INTEREST RATE** | | | | | | | -0.19 |
| *t Stat* | | | | | | | -2.92 |
| *P-value* | | | | | | | 0.00 |
| **F Statistics** | 22.86 | 17.01 | 14.57 | 11.72 | 9.62 | 8.47 | 9.09 |
| **F-sig** | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| **Adjusted R Square** | 0.19 | 0.25 | 0.30 | 0.31 | 0.31 | 0.32 | 0.37 |

Above Table-4.9 indicates that CAPM is a valid model in Pakistan because market premium is significant positively related to portfolio returns. However explanatory power of model is reasonably low for chemicals sector as evident from adjusted $R^2$ which is 19% only it indicates that possibility of others explanatory variables should be of leverage premium in conventional CAPM improve the explanatory power marginally above table 4.9 shows that in Pakistan

Leverage Premium is priced. Similarly Dividend Premium is significantly negatively influencing the returns. It is according to economic rational as when dividend is distributed amount available for reinvestment is decreased which slow down the growth rate. However macroeconomic variable are not significantly influencing the returns of chemical industry it may be noted that explanatory power slightly improved by incorporation of macroeconomic variable as in case of interest rate has a significant impact on returns of chemical industry sector.

**Table – 4.10: Regression Analysis of Pharmaceutical Sector: Market Premium, Industry Specific and Macroeconomic Factors for the period of 2002-2009**

| RP6 Pharmaceutical | Model 1 | Model 2 | Model 3 | Model 4 | Model 5 | Model 6 | Model 7 |
|---|---|---|---|---|---|---|---|
| **INTERCEPT** | 0.07 | 0.07 | 0.07 | 0.06 | 0.06 | 0.07 | 0.06 |
| *t Stat* | 5.31 | 5.20 | 5.09 | 4.72 | 4.22 | 4.50 | 4.29 |
| *P-value* | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| **RM-RF** | 0.09 | 0.09 | 0.09 | 0.08 | 0.08 | 0.08 | 0.08 |
| *t Stat* | 4.99 | 4.80 | 4.63 | 3.69 | 3.67 | 3.90 | 3.83 |
| *P-value* | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| **LEVERAGE PREMIUM** | | 0.09 | -0.03 | 0.04 | 0.04 | -0.03 | -0.12 |
| *t Stat* | | 0.42 | -0.14 | 0.15 | 0.14 | -0.11 | -0.49 |
| *P-value* | | 0.68 | 0.89 | 0.88 | 0.89 | 0.91 | 0.62 |
| **DIVIDEND PREMIUM** | | | -0.28 | -0.28 | -0.29 | -0.30 | -0.33 |
| *t Stat* | | | -1.44 | -1.48 | -1.49 | -1.55 | -1.72 |
| *P-value* | | | 0.15 | 0.14 | 0.14 | 0.13 | 0.09 |
| **F X Rate** | | | | 0.98 | 1.07 | 1.04 | 1.10 |
| *t Stat* | | | | 1.69 | 1.54 | 1.50 | 1.62 |
| *P-value* | | | | 0.09 | 0.13 | 0.14 | 0.11 |
| **INFLATION** | | | | | 0.25 | 0.17 | 0.55 |
| *t Stat* | | | | | 0.25 | 0.17 | 0.56 |
| *P-value* | | | | | 0.80 | 0.86 | 0.58 |
| **MONEY GROWTH M1** | | | | | | -0.19 | -0.19 |
| *t Stat* | | | | | | -1.51 | -1.60 |
| *P-value* | | | | | | 0.14 | 0.11 |
| **INTEREST RATE** | | | | | | | -0.14 |
| *t Stat* | | | | | | | -2.12 |
| *P-value* | | | | | | | 0.04 |
| **F Statistics** | 24.89 | 12.42 | 9.07 | 7.65 | 6.07 | 5.51 | 5.55 |
| **F-sig** | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| **Adjusted R Square** | 0.20 | 0.19 | 0.20 | 0.22 | 0.21 | 0.22 | 0.25 |

Above Table-4.10 indicates that CAPM is a valid model in Pakistan because market premium is significant positively related to portfolio returns. However explanatory power of model is reasonably low for Pharmaceutical sector as evident from adjusted $R^2$ which is 20% only it indicates that possibility of others explanatory variables should be of leverage premium in conventional CAPM does not improve the explanatory power above table shows that in Pakistan

Leverage Premium is not priced for pharmaceutical sector. Dividend Premium does not have a significant influence on the returns. However macroeconomic variable are not significantly influencing the returns of pharmaceutical industry it may be noted that explanatory power slightly improved by incorporation of macroeconomic variable but interest rate has a significant impact on returns of pharmaceutical sector.

**Table – 4.11: Regression Analysis of Food & Personal Care Sector: Market Premium, Industry Specific and Macroeconomic Factors for the period of 2002-2009**

| RP7 Food & personal | Model 1 | Model 2 | Model 3 | Model 4 | Model 5 | Model 6 | Model 7 |
|---|---|---|---|---|---|---|---|
| INTERCEPT | 0.06 | 0.05 | 0.05 | 0.05 | 0.05 | 0.05 | 0.05 |
| *t Stat* | 4.59 | 4.43 | 4.42 | 4.12 | 3.94 | 4.15 | 4.16 |
| *P-value* | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| RM-RF | 0.08 | 0.07 | 0.06 | 0.05 | 0.05 | 0.05 | 0.05 |
| *t Stat* | 4.23 | 3.73 | 3.54 | 2.83 | 2.81 | 2.99 | 3.00 |
| *P-value* | 0.00 | 0.00 | 0.00 | 0.01 | 0.01 | 0.00 | 0.00 |
| LEVERAGE PREMIUM | | 0.71 | 0.39 | 0.43 | 0.43 | 0.39 | 0.40 |
| *t Stat* | | 3.35 | 1.85 | 2.03 | 2.02 | 1.79 | 1.84 |
| *P-value* | | 0.00 | 0.07 | 0.05 | 0.05 | 0.08 | 0.07 |
| DIVIDEND PREMIUM | | | -0.70 | -0.70 | -0.69 | -0.70 | -0.69 |
| *t Stat* | | | -4.19 | -4.22 | -4.03 | -4.08 | -4.02 |
| *P-value* | | | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| F X Rate | | | | 0.60 | 0.46 | 0.43 | 0.42 |
| *t Stat* | | | | 1.19 | 0.75 | 0.71 | 0.69 |
| *P-value* | | | | 0.24 | 0.45 | 0.48 | 0.49 |
| INFLATION | | | | | -0.37 | -0.43 | -0.51 |
| *t Stat* | | | | | -0.43 | -0.50 | -0.58 |
| *P-value* | | | | | 0.67 | 0.62 | 0.56 |
| MONEY GROWTH M1 | | | | | | -0.14 | -0.14 |
| *t Stat* | | | | | | -1.27 | -1.25 |
| *P-value* | | | | | | 0.21 | 0.22 |
| INTEREST RATE | | | | | | | 0.03 |
| *t Stat* | | | | | | | 0.48 |
| *P-value* | | | | | | | 0.63 |
| F Statistics | 17.85 | 15.51 | 18.04 | 13.95 | 11.10 | 9.58 | 8.17 |
| F-sig | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Adjusted R Square | 0.15 | 0.23 | 0.35 | 0.35 | 0.35 | 0.35 | 0.35 |

Above Table-4.11 indicates that CAPM is a valid model in Pakistan because market premium is significant positively related to portfolio returns. However explanatory power of model is reasonably low for Food & personal care products sector as evident from adjusted $R^2$ which is 15% only it indicates that possibility of others explanatory variables should be of leverage premium in conventional CAPM improve the explanatory power marginally above table shows

that in Pakistan Leverage Premium is priced. Similarly Dividend Premium is significantly negatively influencing the returns. It is according to economic rational as when dividend is distributed amount available for reinvestment is decreased which slow down the growth rate. However macroeconomic variable are not significantly influencing the returns of for Food & personal care products industry it may be noted that explanatory power slightly improved by incorporation of macroeconomic variable.

**Table – 4.12: Regression Analysis of Jute Sector: Market Premium, Industry Specific and Macroeconomic Factors for the period of 2002-2009**

| RP8 jutes | Model 1 | Model 2 | Model 3 | Model 4 | Model 5 | Model 6 | Model 7 |
|---|---|---|---|---|---|---|---|
| **INTERCEPT** | 0.08 | 0.08 | 0.08 | 0.08 | 0.08 | 0.09 | 0.09 |
| *t Stat* | 3.76 | 3.60 | 3.54 | 3.25 | 3.21 | 3.42 | 3.26 |
| *P-value* | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| **RM-RF** | 0.11 | 0.10 | 0.10 | 0.08 | 0.08 | 0.09 | 0.09 |
| *t Stat* | 3.37 | 3.05 | 2.97 | 2.31 | 2.29 | 2.46 | 2.38 |
| *P-value* | 0.00 | 0.00 | 0.00 | 0.02 | 0.02 | 0.02 | 0.02 |
| **LEVERAGE PREMIUM** | | 0.56 | 0.49 | 0.58 | 0.58 | 0.49 | 0.40 |
| *t Stat* | | 1.41 | 1.16 | 1.35 | 1.34 | 1.13 | 0.91 |
| *P-value* | | 0.16 | 0.25 | 0.18 | 0.18 | 0.26 | 0.37 |
| **DIVIDEND PREMIUM** | | | -0.14 | -0.14 | -0.10 | -0.11 | -0.14 |
| *t Stat* | | | -0.40 | -0.42 | -0.29 | -0.33 | -0.41 |
| *P-value* | | | 0.69 | 0.68 | 0.77 | 0.74 | 0.68 |
| **F X Rate** | | | | 1.21 | 0.82 | 0.77 | 0.83 |
| *t Stat* | | | | 1.18 | 0.66 | 0.63 | 0.68 |
| *P-value* | | | | 0.24 | 0.51 | 0.53 | 0.50 |
| **INFLATION** | | | | | -1.01 | -1.12 | -0.75 |
| *t Stat* | | | | | -0.58 | -0.64 | -0.42 |
| *P-value* | | | | | 0.56 | 0.52 | 0.67 |
| **MONEY GROWTH M1** | | | | | | -0.26 | -0.27 |
| *t Stat* | | | | | | -1.20 | -1.24 |
| *P-value* | | | | | | 0.23 | 0.22 |
| **INTEREST RATE** | | | | | | | -0.14 |
| *t Stat* | | | | | | | -1.15 |
| *P-value* | | | | | | | 0.25 |
| **F Statistics** | 11.33 | 6.72 | 4.49 | 3.74 | 3.03 | 2.78 | 2.58 |
| **F-sig** | 0.00 | 0.00 | 0.01 | 0.01 | 0.01 | 0.02 | 0.02 |
| **Adjusted R Square** | 0.10 | 0.11 | 0.10 | 0.10 | 0.10 | 0.10 | 0.10 |

Above Table-4.12 indicates that CAPM is a valid model in Pakistan because market premium is significant positively related to portfolio returns. However explanatory power of model is reasonably low for jutes sector as evident from adjusted $R^2$ which is 10% only it indicates that possibility of others explanatory variables should be of leverage premium in conventional CAPM does not improve the explanatory power. Above table 4.12 shows that in Pakistan Leverage

Premium is not priced for jutes sector. Dividend Premium does not have a significant influence on the returns. However macroeconomic variable are not significantly influencing the returns of jutes industry it may be noted that explanatory power slightly improved by incorporation of macroeconomic variable.

**Table – 4.13: Regression Analysis of Leather & Tanneries Sector: Market Premium, Industry Specific and Macroeconomic Factors for the period of 2002-2009**

| RP9 Leather & Tanneries | Model 1 | Model 2 | Model 3 | Model 4 | Model 5 | Model 6 | Model 7 |
|---|---|---|---|---|---|---|---|
| **INTERCEPT** | 0.04 | 0.04 | 0.03 | 0.03 | 0.03 | 0.03 | 0.03 |
| *t Stat* | 2.05 | 1.87 | 1.73 | 1.45 | 1.26 | 1.27 | 1.27 |
| *P-value* | 0.04 | 0.06 | 0.09 | 0.15 | 0.21 | 0.21 | 0.21 |
| **RM-RF** | 0.05 | 0.04 | 0.03 | 0.01 | 0.01 | 0.02 | 0.02 |
| *t Stat* | 1.59 | 1.28 | 1.06 | 0.48 | 0.48 | 0.52 | 0.52 |
| *P-value* | 0.12 | 0.20 | 0.29 | 0.63 | 0.63 | 0.61 | 0.61 |
| **LEVERAGE PREMIUM** | | 0.52 | 0.26 | 0.34 | 0.34 | 0.33 | 0.33 |
| *t Stat* | | 1.54 | 0.74 | 0.95 | 0.95 | 0.89 | 0.88 |
| *P-value* | | 0.13 | 0.46 | 0.34 | 0.35 | 0.38 | 0.38 |
| **DIVIDEND PREMIUM** | | | -0.56 | -0.57 | -0.58 | -0.58 | -0.58 |
| *t Stat* | | | -1.97 | -1.99 | -1.97 | -1.97 | -1.95 |
| *P-value* | | | 0.05 | 0.05 | 0.05 | 0.05 | 0.05 |
| **F X Rate** | | | | 1.15 | 1.24 | 1.23 | 1.22 |
| *t Stat* | | | | 1.34 | 1.19 | 1.18 | 1.17 |
| *P-value* | | | | 0.19 | 0.24 | 0.24 | 0.25 |
| **INFLATION** | | | | | 0.23 | 0.21 | 0.19 |
| *t Stat* | | | | | 0.16 | 0.14 | 0.12 |
| *P-value* | | | | | 0.88 | 0.89 | 0.90 |
| **MONEY GROWTH M1** | | | | | | -0.05 | -0.05 |
| *t Stat* | | | | | | -0.25 | -0.24 |
| *P-value* | | | | | | 0.80 | 0.81 |
| **INTEREST RATE** | | | | | | | 0.01 |
| *t Stat* | | | | | | | 0.08 |
| *P-value* | | | | | | | 0.94 |
| | | | | | | | |
| **F Statistics** | 2.52 | 2.47 | 2.99 | 2.70 | 2.14 | 1.78 | 1.51 |
| **F-sig** | 0.12 | 0.09 | 0.04 | 0.04 | 0.07 | 0.11 | 0.17 |
| **Adjusted R Square** | 0.02 | 0.03 | 0.06 | 0.07 | 0.06 | 0.05 | 0.04 |

Above Table-4.13 indicates that CAPM is not a valid model in Pakistan for Leather & Tanneries sector because market premium is not significant positively related to portfolio returns. However explanatory power of model is reasonably low for Leather & Tanneries as evident from adjusted $R^2$ which is 2% only it indicates that possibility of others explanatory variables should not be explained. Similarly addition of leverage premium in conventional CAPM does not enhance the descriptive power above table 4.13 shows that in Pakistan Leverage Premium is not priced for leather & tanneries sector. Similarly Dividend Premium is significantly negatively influencing the returns. It is according to economic rational as when dividend is distributed amount available for reinvestment is decreased which slow down the growth rate. However macroeconomic variable are not significantly influencing the returns of Leather & Tanneries industry it may be noted that explanatory power is not improved by incorporation of macroeconomic variable.

**Table – 4.14: Regression Analysis of Miscellaneous Sector: Market Premium, Industry Specific and Macroeconomic Factors for the period of 2002-2009**

| RP10 Miscellaneous | Model 1 | Model 2 | Model 3 | Model 4 | Model 5 | Model 6 | Model 7 |
|---|---|---|---|---|---|---|---|
| **INTERCEPT** | 0.07 | 0.07 | 0.06 | 0.06 | 0.06 | 0.07 | 0.06 |
| *t Stat* | 4.28 | 4.14 | 4.04 | 3.84 | 3.77 | 3.73 | 3.56 |
| *P-value* | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| **RM-RF** | 0.09 | 0.09 | 0.08 | 0.07 | 0.07 | 0.08 | 0.07 |
| *t Stat* | 3.99 | 3.70 | 3.48 | 3.01 | 2.98 | 3.00 | 2.92 |
| *P-value* | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| **LEVERAGE PREMIUM** | | 0.32 | 0.00 | 0.02 | 0.02 | 0.00 | -0.06 |
| *t Stat* | | 1.15 | -0.01 | 0.08 | 0.08 | 0.01 | -0.21 |
| *P-value* | | 0.25 | 0.99 | 0.94 | 0.93 | 0.99 | 0.83 |
| **DIVIDEND PREMIUM** | | | -0.70 | -0.70 | -0.67 | -0.67 | -0.69 |
| *t Stat* | | | -3.07 | -3.07 | -2.87 | -2.87 | -2.96 |
| *P-value* | | | 0.00 | 0.00 | 0.01 | 0.01 | 0.00 |
| **F X Rate** | | | | 0.36 | 0.07 | 0.06 | 0.10 |
| *t Stat* | | | | 0.53 | 0.09 | 0.07 | 0.13 |
| *P-value* | | | | 0.60 | 0.93 | 0.94 | 0.90 |
| **INFLATION** | | | | | -0.75 | -0.78 | -0.51 |
| *t Stat* | | | | | -0.64 | -0.66 | -0.43 |
| *P-value* | | | | | 0.52 | 0.51 | 0.67 |
| **MONEY GROWTH M1** | | | | | | -0.06 | -0.07 |
| *t Stat* | | | | | | -0.44 | -0.47 |
| *P-value* | | | | | | 0.66 | 0.64 |
| **INTEREST RATE** | | | | | | | -0.10 |
| *t Stat* | | | | | | | -1.21 |
| *P-value* | | | | | | | 0.23 |
| **F Statistics** | 15.88 | 8.63 | 9.42 | 7.08 | 5.71 | 4.75 | 4.30 |
| **F-sig** | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| **Adjusted R Square** | 0.14 | 0.14 | 0.21 | 0.20 | 0.20 | 0.19 | 0.20 |

Above Table-4.14 indicates that CAPM is a valid model in Pakistan because market premium is significant positively related to portfolio returns. However explanatory power of model is reasonably low for Misc sector as evident from adjusted $R^2$ which is 14% only it indicates that possibility of others explanatory variables should be of leverage premium in conventional CAPM does not improve the explanatory power above table shows that in Pakistan Leverage Premium is

not priced for Misc sector. Similarly Dividend Premium is significantly negatively influencing the returns. It is according to economic rational as when dividend is distributed amount available for reinvestment is decreased which slow down the growth rate. However macroeconomic variable are not significantly influencing the returns of Misc industry it may be noted that explanatory power was not enhanced by incorporation of macroeconomic variable.

**Table – 4.15: Regression Analysis of Oil & Gas Market Sector: Market Premium, Industry Specific and Macroeconomic Factors for the period of 2002-2009**

| RP11 Oil & Gas mkt | Model 1 | Model 2 | Model 3 | Model 4 | Model 5 | Model 6 | Model 7 |
|---|---|---|---|---|---|---|---|
| INTERCEPT | 0.08 | 0.08 | 0.08 | 0.07 | 0.07 | 0.08 | 0.07 |
| *t Stat* | 4.89 | 4.77 | 4.81 | 4.36 | 3.84 | 3.88 | 3.76 |
| *P-value* | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| RM-RF | 0.11 | 0.11 | 0.11 | 0.08 | 0.08 | 0.09 | 0.09 |
| *t Stat* | 4.54 | 4.32 | 4.36 | 3.14 | 3.14 | 3.21 | 3.15 |
| *P-value* | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| LEVERAGE PREMIUM | | 0.20 | 0.28 | 0.43 | 0.43 | 0.39 | 0.35 |
| *t Stat* | | 0.66 | 0.87 | 1.35 | 1.34 | 1.20 | 1.07 |
| *P-value* | | 0.51 | 0.38 | 0.18 | 0.18 | 0.23 | 0.29 |
| DIVIDEND PREMIUM | | | 0.19 | 0.18 | 0.16 | 0.15 | 0.14 |
| *t Stat* | | | 0.72 | 0.71 | 0.62 | 0.60 | 0.55 |
| *P-value* | | | 0.47 | 0.48 | 0.54 | 0.55 | 0.58 |
| F X Rate | | | | 2.06 | 2.25 | 2.22 | 2.25 |
| *t Stat* | | | | 2.75 | 2.49 | 2.46 | 2.47 |
| *P-value* | | | | 0.01 | 0.01 | 0.02 | 0.02 |
| INFLATION | | | | | 0.47 | 0.42 | 0.57 |
| *t Stat* | | | | | 0.37 | 0.33 | 0.43 |
| *P-value* | | | | | 0.71 | 0.74 | 0.67 |
| MONEY GROWTH M1 | | | | | | -0.12 | -0.12 |
| *t Stat* | | | | | | -0.73 | -0.74 |
| *P-value* | | | | | | 0.47 | 0.46 |
| INTEREST RATE | | | | | | | -0.05 |
| *t Stat* | | | | | | | -0.60 |
| *P-value* | | | | | | | 0.55 |
| F Statistics | 20.62 | 10.46 | 7.11 | 7.61 | 6.06 | 5.11 | 4.40 |
| F-sig | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Adjusted R Square | 0.17 | 0.17 | 0.16 | 0.22 | 0.21 | 0.21 | 0.20 |

**Above** Table-4.15 indicates that CAPM is a valid model in Pakistan because market premium is significant positively related to portfolio returns. However explanatory power of model is reasonably low for Oil & Gas sector as evident from adjusted $R^2$ which is 17% only it indicates that possibility of others explanatory variables should be explored. Addition of leverage premium in conventional CAPM does not improve the explanatory power. Above table 4.15

shows that in Pakistan Leverage Premium is not priced for Oil & Gas sector. Dividend Premium does not have a significant influence on the returns. Similarly macroeconomic variable are not significantly influencing the returns of Oil & Gas industry it may be noted that explanatory power slightly improved by incorporation of macroeconomic variable of foreign exchange rate.

**Table – 4.16: Regression Analysis of Power Generation & Distribution Sector: Market Premium, Industry Specific and Macroeconomic Factors for the period of 2002-2009**

| RP12 Power Gen & Dist | Model 1 | Model 2 | Model 3 | Model 4 | Model 5 | Model 6 | Model 7 |
|---|---|---|---|---|---|---|---|
| **INTERCEPT** | 0.07 | 0.06 | 0.06 | 0.06 | 0.05 | 0.06 | 0.05 |
| *t Stat* | 3.28 | 3.08 | 2.96 | 2.73 | 2.25 | 2.58 | 2.39 |
| *P-value* | 0.00 | 0.00 | 0.00 | 0.01 | 0.03 | 0.01 | 0.02 |
| **RM-RF** | 0.10 | 0.09 | 0.09 | 0.08 | 0.08 | 0.09 | 0.08 |
| *t Stat* | 3.57 | 3.16 | 2.98 | 2.43 | 2.44 | 2.66 | 2.58 |
| *P-value* | 0.00 | 0.00 | 0.00 | 0.02 | 0.02 | 0.01 | 0.01 |
| **LEVERAGE PREMIUM** | | 0.77 | 0.57 | 0.63 | 0.62 | 0.53 | 0.43 |
| *t Stat* | | 2.22 | 1.55 | 1.67 | 1.66 | 1.41 | 1.13 |
| *P-value* | | 0.03 | 0.12 | 0.10 | 0.10 | 0.16 | 0.26 |
| **DIVIDEND PREMIUM** | | | -0.43 | -0.43 | -0.47 | -0.48 | -0.51 |
| *t Stat* | | | -1.45 | -1.46 | -1.56 | -1.61 | -1.72 |
| *P-value* | | | 0.15 | 0.15 | 0.12 | 0.11 | 0.09 |
| **F X Rate** | | | | 0.77 | 1.16 | 1.11 | 1.18 |
| *t Stat* | | | | 0.86 | 1.08 | 1.04 | 1.11 |
| *P-value* | | | | 0.39 | 0.28 | 0.30 | 0.27 |
| **INFLATION** | | | | | 1.00 | 0.89 | 1.29 |
| *t Stat* | | | | | 0.66 | 0.59 | 0.85 |
| *P-value* | | | | | 0.51 | 0.56 | 0.40 |
| **MONEY GROWTH M1** | | | | | | -0.27 | -0.28 |
| *t Stat* | | | | | | -1.45 | -1.50 |
| *P-value* | | | | | | 0.15 | 0.14 |
| **INTEREST RATE** | | | | | | | -0.15 |
| *t Stat* | | | | | | | -1.45 |
| *P-value* | | | | | | | 0.15 |
| **F Statistics** | 12.74 | 9.11 | 6.84 | 5.30 | 4.31 | 3.98 | 3.75 |
| **F-sig** | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| **Adjusted R Square** | 0.11 | 0.15 | 0.16 | 0.15 | 0.15 | 0.16 | 0.17 |

Above Table-4.16 indicates that CAPM is a valid model in Pakistan because market premium is significant positively related to portfolio returns. However explanatory power of model is reasonably low for Power Generation & Distribution sector as evident from adjusted $R^2$ which is 11% only it indicates that possibility of others explanatory variables should be explored. Addition of leverage premium in conventional CAPM does not improve the explanatory power above table shows that in Pakistan Leverage Premium is not priced for Oil & Gas sector. Dividend Premium does not have a significant influence on the returns. Similarly macroeconomic variable are not significantly influencing the returns of Power Generation & Distribution industry it may be noted that explanatory power is not improved by incorporation of macroeconomic variable.

**Table – 4.17: Regression Analysis of Refinery Sector: Market Premium, Industry Specific and Macroeconomic Factors for the period of 2002-2009**

| RP13 Refinery | Model 1 | Model 2 | Model 3 | Model 4 | Model 5 | Model 6 | Model 7 |
|---|---|---|---|---|---|---|---|
| **INTERCEPT** | 0.09 | 0.09 | 0.09 | 0.08 | 0.08 | 0.09 | 0.09 |
| *t Stat* | 3.43 | 3.24 | 3.43 | 3.02 | 2.57 | 2.87 | 2.79 |
| *P-value* | 0.00 | 0.00 | 0.00 | 0.00 | 0.01 | 0.01 | 0.01 |
| **RM-RF** | 0.14 | 0.12 | 0.13 | 0.10 | 0.10 | 0.11 | 0.11 |
| *t Stat* | 3.45 | 3.08 | 3.30 | 2.32 | 2.33 | 2.54 | 2.50 |
| *P-value* | 0.00 | 0.00 | 0.00 | 0.02 | 0.02 | 0.01 | 0.01 |
| **LEVERAGE PREMIUM** | | 0.87 | 1.21 | 1.38 | 1.38 | 1.26 | 1.23 |
| *t Stat* | | 1.83 | 2.38 | 2.74 | 2.73 | 2.47 | 2.36 |
| *P-value* | | 0.07 | 0.02 | 0.01 | 0.01 | 0.02 | 0.02 |
| **DIVIDEND PREMIUM** | | | 0.73 | 0.72 | 0.67 | 0.66 | 0.65 |
| *t Stat* | | | 1.80 | 1.80 | 1.66 | 1.63 | 1.59 |
| *P-value* | | | 0.08 | 0.07 | 0.10 | 0.11 | 0.11 |
| **F X Rate** | | | | 2.50 | 2.91 | 2.84 | 2.86 |
| *t Stat* | | | | 2.09 | 2.02 | 1.98 | 1.98 |
| *P-value* | | | | 0.04 | 0.05 | 0.05 | 0.05 |
| **INFLATION** | | | | | 1.05 | 0.90 | 1.02 |
| *t Stat* | | | | | 0.51 | 0.44 | 0.49 |
| *P-value* | | | | | 0.61 | 0.66 | 0.62 |
| **MONEY GROWTH M1** | | | | | | -0.36 | -0.36 |
| *t Stat* | | | | | | -1.40 | -1.40 |
| *P-value* | | | | | | 0.17 | 0.17 |
| **INTEREST RATE** | | | | | | | -0.05 |
| *t Stat* | | | | | | | -0.33 |
| *P-value* | | | | | | | 0.75 |
| **F Statistics** | 11.88 | 7.77 | 6.38 | 6.05 | 4.85 | 4.41 | 3.76 |
| **F-sig** | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| **Adjusted R Square** | 0.10 | 0.12 | 0.15 | 0.18 | 0.17 | 0.18 | 0.17 |

Above Table-4.17 indicates that CAPM is a valid model in Pakistan because market premium is significant positively related to portfolio returns. However explanatory power of model is reasonably low for refinery sector as evident from adjusted $R^2$ which is 10% only it indicates that possibility of others explanatory variables should be explored. Addition of leverage premium in conventional CAPM improve the explanatory power marginally and is significant at 90%

confidence level above table shows that in Pakistan Leverage Premium is priced. Similarly Dividend Premium is insignificantly negatively influencing the returns. However macroeconomic variable are not significantly influencing the returns of refinery industry it may be noted that explanatory power slightly improved by incorporation of macroeconomic variable it also may be noted that foreign exchange rate has a significant impact on the returns for refinery sector.

**Table – 4.18: Regression Analysis of Oil & Gas Exploration Sector: Market Premium, Industry Specific and Macroeconomic Factors for the period of 2002-2009**

| RP14 Oil & Gas Expl | Model 1 | Model 2 | Model 3 | Model 4 | Model 5 | Model 6 | Model 7 |
|---|---|---|---|---|---|---|---|
| **INTERCEPT** | 0.06 | 0.05 | 0.05 | 0.06 | 0.08 | 0.09 | 0.09 |
| *t Stat* | 1.96 | 1.70 | 1.64 | 2.05 | 2.65 | 2.92 | 2.86 |
| *P-value* | 0.05 | 0.09 | 0.10 | 0.04 | 0.01 | 0.00 | 0.01 |
| **RM-RF** | 0.02 | 0.00 | 0.00 | 0.03 | 0.03 | 0.04 | 0.04 |
| *t Stat* | 0.53 | 0.01 | -0.06 | 0.76 | 0.71 | 0.92 | 0.90 |
| *P-value* | 0.60 | 0.99 | 0.95 | 0.45 | 0.48 | 0.36 | 0.37 |
| **LEVERAGE PREMIUM** | | 1.38 | 1.27 | 1.08 | 1.09 | 0.98 | 0.96 |
| *t Stat* | | 2.82 | 2.42 | 2.07 | 2.11 | 1.87 | 1.80 |
| *P-value* | | 0.01 | 0.02 | 0.04 | 0.04 | 0.06 | 0.07 |
| **DIVIDEND PREMIUM** | | | -0.23 | -0.22 | -0.07 | -0.08 | -0.09 |
| *t Stat* | | | -0.55 | -0.53 | -0.16 | -0.20 | -0.21 |
| *P-value* | | | 0.58 | 0.60 | 0.87 | 0.84 | 0.84 |
| **F X Rate** | | | | -2.67 | -4.18 | -4.25 | -4.24 |
| *t Stat* | | | | -2.15 | -2.85 | -2.90 | -2.87 |
| *P-value* | | | | 0.03 | 0.01 | 0.00 | 0.01 |
| **INFLATION** | | | | | -3.90 | -4.04 | -3.98 |
| *t Stat* | | | | | -1.87 | -1.94 | -1.87 |
| *P-value* | | | | | 0.06 | 0.06 | 0.07 |
| **MONEY GROWTH M1** | | | | | | -0.34 | -0.34 |
| *t Stat* | | | | | | -1.29 | -1.29 |
| *P-value* | | | | | | 0.20 | 0.20 |
| **INTEREST RATE** | | | | | | | -0.02 |
| *t Stat* | | | | | | | -0.17 |
| *P-value* | | | | | | | 0.86 |
| **F Statistics** | 0.28 | 4.14 | 2.84 | 3.37 | 3.47 | 3.19 | 2.71 |
| **F-sig** | 0.60 | 0.02 | 0.04 | 0.01 | 0.01 | 0.01 | 0.01 |
| **Adjusted R Square** | -0.01 | 0.06 | 0.05 | 0.09 | 0.11 | 0.12 | 0.11 |

Above Table-4.18 indicates that market premium is not significant positively related to portfolio returns for oil and gas exploration sector. Explanatory power of model is not sufficient for oil and gas exploration sector as evident from adjusted $R^2$ which is negative it indicates that possibility of others explanatory variables should be explored. Addition of leverage premium in conventional CAPM improve the explanatory power marginally. Above table 4.18 shows that in

Pakistan Leverage Premium is priced. Dividend Premium does not have a significant influence on the returns. However macroeconomic variable are not significantly influencing the returns of refinery industry it may be noted that explanatory power is not improved by incorporation of macroeconomic variable it also may be noted that foreign exchange rate has a significant impact on the returns for refinery sector.

**Table – 4.19: Regression Analysis of Sugar Sector: Market Premium, Industry Specific and Macroeconomic Factors for the period of 2002-2009**

| RP15 Sugar Allied | Model 1 | Model 2 | Model 3 | Model 4 | Model 5 | Model 6 | Model 7 |
|---|---|---|---|---|---|---|---|
| **INTERCEPT** | 0.06 | 0.05 | 0.05 | 0.05 | 0.05 | 0.05 | 0.05 |
| *t Stat* | 4.04 | 3.84 | 3.74 | 3.56 | 3.22 | 3.27 | 3.14 |
| *P-value* | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| **RM-RF** | 0.08 | 0.07 | 0.07 | 0.06 | 0.06 | 0.06 | 0.06 |
| *t Stat* | 3.75 | 3.27 | 3.14 | 2.70 | 2.68 | 2.75 | 2.69 |
| *P-value* | 0.00 | 0.00 | 0.00 | 0.01 | 0.01 | 0.01 | 0.01 |
| **LEVERAGE PREMIUM** | | 0.71 | 0.62 | 0.65 | 0.06 | 0.61 | 0.58 |
| *t Stat* | | 2.88 | 2.33 | 2.38 | 2.36 | 2.21 | 2.03 |
| *P-value* | | 0.00 | 0.02 | 0.02 | 0.02 | 0.03 | 0.04 |
| **DIVIDEND PREMIUM** | | | -0.20 | -0.20 | -0.21 | -0.21 | -0.22 |
| *t Stat* | | | -0.96 | -0.96 | -0.95 | -0.97 | -1.02 |
| *P-value* | | | 0.34 | 0.34 | 0.34 | 0.34 | 0.31 |
| **F X Rate** | | | | 0.34 | 0.38 | 0.36 | 0.39 |
| *t Stat* | | | | 0.53 | 0.49 | 0.46 | 0.50 |
| *P-value* | | | | 0.60 | 0.63 | 0.64 | 0.62 |
| **INFLATION** | | | | | 0.09 | 0.05 | 0.21 |
| *t Stat* | | | | | 0.08 | 0.05 | 0.19 |
| *P-value* | | | | | 0.93 | 0.96 | 0.85 |
| **MONEY GROWTH M1** | | | | | | -0.09 | -0.10 |
| *t Stat* | | | | | | -0.67 | -0.69 |
| *P-value* | | | | | | 0.51 | 0.49 |
| **INTEREST RATE** | | | | | | | -0.06 |
| *t Stat* | | | | | | | -0.76 |
| *P-value* | | | | | | | 0.45 |
| **F Statistics** | 14.06 | 11.73 | 8.12 | 6.11 | 4.84 | 4.08 | 3.56 |
| **F-sig** | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| **Adjusted R Square** | 0.12 | 0.18 | 0.18 | 0.18 | 0.17 | 0.16 | 0.16 |

Above Table-4.19 indicates that CAPM is a valid model in Pakistan because market premium is significant positively related to portfolio returns. However explanatory power of model is reasonably low for Sugar allied sector as evident from adjusted $R^2$ which is 12% only it indicates that possibility of others explanatory variables should be explored. Addition of leverage premium in conventional CAPM improve the explanatory power marginally. Above table 4.19

shows that in Pakistan Leverage Premium is priced. Dividend Premium does not have a significant influence on the returns. Similarly macroeconomic variable are not significantly influencing the returns of Sugar allied industry it may be noted that explanatory power is not improved by incorporation of macroeconomic variable.

**Table – 4.20: Regression Analysis of Textile Sector: Market Premium, Industry Specific and Macroeconomic Factors for the period of 2002-2009**

| RP16 Textile Spinning | Model 1 | Model 2 | Model 3 | Model 4 | Model 5 | Model 6 | Model 7 |
|---|---|---|---|---|---|---|---|
| **INTERCEPT** | 0.05 | 0.04 | 0.04 | 0.04 | 0.05 | 0.04 | 0.04 |
| *t Stat* | 3.22 | 3.00 | 2.85 | 2.75 | 3.11 | 2.90 | 2.82 |
| *P-value* | 0.00 | 0.00 | 0.01 | 0.01 | 0.00 | 0.00 | 0.01 |
| **RM-RF** | 0.08 | 0.07 | 0.06 | 0.06 | 0.06 | 0.06 | 0.06 |
| *t Stat* | 3.78 | 3.26 | 3.03 | 2.72 | 2.69 | 2.60 | 2.56 |
| *P-value* | 0.00 | 0.00 | 0.00 | 0.01 | 0.01 | 0.01 | 0.01 |
| **LEVERAGE PREMIUM** | | 0.85 | 0.61 | 0.62 | 0.62 | 0.63 | 0.62 |
| *t Stat* | | 3.61 | 2.49 | 2.47 | 2.50 | 2.49 | 2.38 |
| *P-value* | | 0.00 | 0.01 | 0.02 | 0.01 | 0.01 | 0.02 |
| **DIVIDEND PREMIUM** | | | -0.53 | -0.53 | -0.47 | -0.47 | -0.47 |
| *t Stat* | | | -2.68 | -2.67 | -2.34 | -2.32 | -2.33 |
| *P-value* | | | 0.01 | 0.01 | 0.02 | 0.02 | 0.02 |
| **F X Rate** | | | | 0.11 | -0.45 | -0.45 | -0.44 |
| *t Stat* | | | | 0.19 | -0.64 | -0.63 | -0.61 |
| *P-value* | | | | 0.85 | 0.52 | 0.53 | 0.54 |
| **INFLATION** | | | | | -1.46 | -1.45 | -1.39 |
| *t Stat* | | | | | -1.45 | -1.43 | -1.34 |
| *P-value* | | | | | 0.15 | 0.16 | 0.18 |
| **MONEY GROWTH M1** | | | | | | 0.03 | 0.03 |
| *t Stat* | | | | | | 0.24 | 0.23 |
| *P-value* | | | | | | 0.81 | 0.82 |
| **INTEREST RATE** | | | | | | | -0.02 |
| *t Stat* | | | | | | | -0.33 |
| *P-value* | | | | | | | 0.74 |
| **F Statistics** | 14.29 | 14.58 | 12.75 | 9.47 | 8.09 | 6.68 | 5.69 |
| **F-sig** | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| **Adjusted R Square** | 0.12 | 0.22 | 0.27 | 0.26 | 0.27 | 0.26 | 0.26 |

Above Table-4.20 indicates that CAPM is a valid model in Pakistan because market premium is significant positively related to portfolio returns. However explanatory power of model is reasonably low for cement sector as evident from adjusted R2 which is 12% only it indicates that possibility of others explanatory variables should be of leverage premium in conventional CAPM improve the explanatory power above table shows that in Pakistan Leverage Premium is priced. Similarly Dividend Premium is significantly negatively influencing the returns. It is according to economic rational as when dividend is distributed amount available for reinvestment is decreased which slow down the growth rate. However macroeconomic variable are not significantly influencing the returns of cement industry it may be noted that explanatory power slightly improved by incorporation of macroeconomic variable.

**Table – 4.21: Regression Analysis of Tobacco Sector: Market Premium, Industry Specific and Macroeconomic Factors for the period of 2002-2009**

| RP17 Tobacco | Model 1 | Model 2 | Model 3 | Model 4 | Model 5 | Model 6 | Model 7 |
|---|---|---|---|---|---|---|---|
| INTERCEPT | 0.07 | 0.07 | 0.06 | 0.06 | 0.07 | 0.07 | 0.07 |
| *t Stat* | 2.89 | 2.82 | 2.70 | 2.57 | 2.56 | 2.53 | 2.42 |
| *P-value* | 0.00 | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 | 0.02 |
| RM-RF | 0.07 | 0.07 | 0.07 | 0.06 | 0.06 | 0.06 | 0.06 |
| *t Stat* | 2.12 | 2.03 | 1.84 | 1.58 | 1.55 | 1.57 | 1.52 |
| *P-value* | 0.04 | 0.05 | 0.07 | 0.12 | 0.12 | 0.12 | 0.13 |
| LEVERAGE PREMIUM | | 0.11 | -0.16 | -0.14 | -0.14 | -0.16 | -0.22 |
| *t Stat* | | 0.26 | -0.37 | -0.31 | -0.31 | -0.35 | -0.45 |
| *P-value* | | 0.80 | 0.71 | 0.76 | 0.76 | 0.73 | 0.65 |
| DIVIDEND PREMIUM | | | -0.59 | -0.59 | -0.56 | -0.56 | -0.58 |
| *t Stat* | | | -1.66 | -1.66 | -1.52 | -1.52 | -1.55 |
| *P-value* | | | 0.10 | 0.10 | 0.13 | 0.13 | 0.12 |
| F X Rate | | | | 0.33 | -0.05 | -0.06 | -0.02 |
| *t Stat* | | | | 0.31 | -0.04 | -0.04 | -0.02 |
| *P-value* | | | | 0.76 | 0.97 | 0.96 | 0.99 |
| INFLATION | | | | | -0.97 | -1.00 | -0.78 |
| *t Stat* | | | | | -0.53 | -0.54 | -0.41 |
| *P-value* | | | | | 0.60 | 0.59 | 0.68 |
| MONEY GROWTH M1 | | | | | | -0.06 | -0.07 |
| *t Stat* | | | | | | -0.28 | -0.30 |
| *P-value* | | | | | | 0.78 | 0.77 |
| INTEREST RATE | | | | | | | -0.08 |
| *t Stat* | | | | | | | -0.64 |
| *P-value* | | | | | | | 0.52 |
| **F Statistics** | 4.51 | 2.26 | 2.46 | 1.85 | 1.52 | 1.27 | 1.14 |
| **F-sig** | 0.04 | 0.11 | 0.07 | 0.13 | 0.19 | 0.28 | 0.35 |
| **Adjusted R Square** | 0.04 | 0.03 | 0.04 | 0.03 | 0.03 | 0.02 | 0.01 |

Above Table-4.21 indicates that CAPM is a valid model in Pakistan because market premium is significant positively related to portfolio returns. However explanatory power of model is reasonably low for Tobacco sector as evident from adjusted $R^2$ which is 4% only it indicates that possibility of others explanatory variables should be explored. Addition of leverage premium in conventional CAPM does not improve the explanatory power. Above table 4.21 shows that in

Pakistan Leverage Premium is not priced for Tobacco sector.. Similarly Dividend Premium is significantly negatively influencing the returns at a confidence level of 95%. Similarly macroeconomic variable are not significantly influencing the returns of Tobacco industry it may be noted that explanatory power slightly decreases by incorporation of macroeconomic variable.

**Table – 4.22: Regression Analysis of Transport Sector: Market Premium, Industry Specific and Macroeconomic Factors for the period of 2002-2009**

| RP18 Transport | Model 1 | Model 2 | Model 3 | Model 4 | Model 5 | Model 6 | Model 7 |
|---|---|---|---|---|---|---|---|
| **INTERCEPT** | 0.11 | 0.10 | 0.10 | 0.09 | 0.10 | 0.11 | 0.10 |
| *t Stat* | 3.89 | 3.70 | 3.60 | 3.37 | 3.22 | 3.35 | 3.21 |
| *P-value* | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| **RM-RF** | 0.14 | 0.12 | 0.12 | 0.10 | 0.10 | 0.11 | 0.11 |
| *t Stat* | 3.42 | 3.01 | 2.88 | 2.35 | 2.33 | 2.45 | 2.38 |
| *P-value* | 0.00 | 0.00 | 0.00 | 0.02 | 0.02 | 0.02 | 0.02 |
| **LEVERAGE PREMIUM** | | 1.03 | 0.87 | 0.94 | 0.94 | 0.86 | 0.77 |
| *t Stat* | | 2.18 | 1.71 | 1.82 | 1.81 | 1.63 | 1.45 |
| *P-value* | | 0.03 | 0.09 | 0.07 | 0.07 | 0.11 | 0.15 |
| **DIVIDEND PREMIUM** | | | -0.36 | -0.36 | -0.34 | -0.35 | -0.37 |
| *t Stat* | | | -0.89 | -0.90 | -0.81 | -0.84 | -0.89 |
| *P-value* | | | 0.38 | 0.37 | 0.42 | 0.41 | 0.37 |
| **F X Rate** | | | | 1.03 | 0.75 | 0.71 | 0.77 |
| *t Stat* | | | | 0.84 | 0.51 | 0.48 | 0.52 |
| *P-value* | | | | 0.40 | 0.61 | 0.63 | 0.61 |
| **INFLATION** | | | | | -0.71 | -0.81 | -0.47 |
| *t Stat* | | | | | -0.34 | -0.39 | -0.22 |
| *P-value* | | | | | 0.74 | 0.70 | 0.83 |
| **MONEY GROWTH M1** | | | | | | -0.24 | -0.25 |
| *t Stat* | | | | | | -0.93 | -0.95 |
| *P-value* | | | | | | 0.35 | 0.34 |
| **INTEREST RATE** | | | | | | | -0.12 |
| *t Stat* | | | | | | | -0.87 |
| *P-value* | | | | | | | 0.39 |
| **F Statistics** | 11.70 | 8.47 | 5.90 | 4.59 | 3.66 | 3.19 | 2.83 |
| **F-sig** | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.01 | 0.01 |
| **Adjusted R Square** | 0.10 | 0.14 | 0.13 | 0.13 | 0.12 | 0.12 | 0.12 |

Above Table-4.22 indicates that CAPM is a valid model in Pakistan because market premium is significant positively related to portfolio returns. However explanatory power of model is reasonably low for Transport sector as evident from adjusted $R^2$ which is 10% only it indicates that possibility of others explanatory variables should be explored. Addition of leverage premium in conventional CAPM improve the explanatory power marginally above table shows that in Pakistan Leverage Premium is priced. Dividend Premium does not have a significant influence on the returns. Similarly macroeconomic variable are not significantly influencing the returns of Transport industry it may be noted that explanatory power is not improved by incorporation of macroeconomic variable.

**Table – 4.23: Regression Analysis of Technology & Communication Sector: Market Premium, Industry Specific and Macroeconomic Factors for the period of 2002-2009**

| RP19 Tech & Com | Model 1 | Model 2 | Model 3 | Model 4 | Model 5 | Model 6 | Model 7 |
|---|---|---|---|---|---|---|---|
| **INTERCEPT** | 0.10 | 0.09 | 0.09 | 0.08 | 0.07 | 0.08 | 0.08 |
| *t Stat* | 3.58 | 3.42 | 3.33 | 2.85 | 2.54 | 2.59 | 2.48 |
| *P-value* | 0.00 | 0.00 | 0.00 | 0.01 | 0.01 | 0.01 | 0.02 |
| **RM-RF** | 0.14 | 0.13 | 0.13 | 0.08 | 0.08 | 0.09 | 0.09 |
| *t Stat* | 3.58 | 3.26 | 3.15 | 1.95 | 1.95 | 2.01 | 1.96 |
| *P-value* | 0.00 | 0.00 | 0.00 | 0.05 | 0.05 | 0.05 | 0.05 |
| **LEVERAGE PREMIUM** | | 0.69 | 0.55 | 0.79 | 0.78 | 0.73 | 0.66 |
| *t Stat* | | 1.44 | 1.07 | 1.56 | 1.55 | 1.43 | 1.27 |
| *P-value* | | 0.15 | 0.29 | 0.12 | 0.12 | 0.16 | 0.21 |
| **DIVIDEND PREMIUM** | | | -0.30 | -0.32 | -0.33 | -0.34 | -0.36 |
| *t Stat* | | | -0.74 | -0.80 | -0.82 | -0.83 | -0.88 |
| *P-value* | | | 0.46 | 0.43 | 0.42 | 0.41 | 0.38 |
| **F X Rate** | | | | 3.37 | 3.51 | 3.48 | 3.53 |
| *t Stat* | | | | 2.83 | 2.44 | 2.41 | 2.44 |
| *P-value* | | | | 0.01 | 0.02 | 0.02 | 0.02 |
| **INFLATION** | | | | | 0.36 | 0.30 | 0.58 |
| *t Stat* | | | | | 0.18 | 0.15 | 0.28 |
| *P-value* | | | | | 0.86 | 0.88 | 0.78 |
| **MONEY GROWTH M1** | | | | | | -0.15 | -0.16 |
| *t Stat* | | | | | | -0.60 | -0.62 |
| *P-value* | | | | | | 0.55 | 0.54 |
| **INTEREST RATE** | | | | | | | -0.10 |
| *t Stat* | | | | | | | -0.73 |
| *P-value* | | | | | | | 0.47 |
| **F Statistics** | 12.81 | 7.51 | 5.16 | 6.17 | 4.89 | 4.10 | 3.57 |
| **F-sig** | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| **Adjusted R Square** | 0.11 | 0.12 | 0.12 | 0.18 | 0.17 | 0.16 | 0.16 |

Above Table-4.23 indicates that CAPM is a valid model in Pakistan because market premium is significant positively related to portfolio returns. However explanatory power of model is reasonably low for Technology and Communication sector as evident from adjusted $R^2$ which is 11% only it indicates that possibility of others explanatory variables should be explored. Addition of leverage premium in conventional CAPM does not improve the explanatory power.

Above table 4.23 shows that in Pakistan Leverage Premium is not priced for Technology and Communication sector. Dividend Premium does not have a significant influence on the returns. However macroeconomic variable are not significantly influencing the returns of Technology and Communication industry it may be noted that explanatory power is reduced by incorporation of macroeconomic variables but foreign exchange rate has a significant effect on returns for technology and communication sector.

**Table – 4.24: Regression Analysis of Woollen Sector: Market Premium, Industry Specific and Macroeconomic Factors for the period of 2002-2009**

| RP20 Woollen | Model 1 | Model 2 | Model 3 | Model 4 | Model 5 | Model 6 | Model 7 |
|---|---|---|---|---|---|---|---|
| **INTERCEPT** | 0.04 | 0.04 | 0.04 | 0.04 | 0.04 | 0.05 | 0.05 |
| *t Stat* | 1.33 | 1.35 | 1.31 | 1.26 | 1.25 | 1.62 | 1.43 |
| *P-value* | 0.19 | 0.18 | 0.19 | 0.21 | 0.21 | 0.11 | 0.16 |
| **RM-RF** | 0.06 | 0.06 | 0.06 | 0.06 | 0.06 | 0.07 | 0.06 |
| *t Stat* | 1.46 | 1.49 | 1.44 | 1.29 | 1.28 | 1.51 | 1.42 |
| *P-value* | 0.15 | 0.14 | 0.15 | 0.20 | 0.20 | 0.13 | 0.16 |
| **LEVERAGE PREMIUM** | | -0.16 | -0.22 | -0.21 | -0.21 | -0.34 | -0.49 |
| *t Stat* | | -0.34 | -0.43 | -0.41 | -0.40 | -0.64 | -0.91 |
| *P-value* | | 0.74 | 0.67 | 0.69 | 0.69 | 0.52 | 0.36 |
| **DIVIDEND PREMIUM** | | | -0.13 | -0.13 | -0.11 | -0.13 | -0.17 |
| *t Stat* | | | -0.32 | -0.32 | -0.26 | -0.31 | -0.42 |
| *P-value* | | | 0.75 | 0.75 | 0.79 | 0.76 | 0.68 |
| **F X Rate** | | | | 0.11 | -0.11 | -0.18 | -0.07 |
| *t Stat* | | | | 0.09 | -0.07 | -0.12 | -0.05 |
| *P-value* | | | | 0.93 | 0.94 | 0.91 | 0.96 |
| **INFLATION** | | | | | -0.55 | -0.71 | -0.10 |
| *t Stat* | | | | | -0.26 | -0.33 | -0.05 |
| *P-value* | | | | | 0.80 | 0.74 | 0.96 |
| **MONEY GROWTH M1** | | | | | | -0.38 | -0.40 |
| *t Stat* | | | | | | -1.45 | -1.51 |
| *P-value* | | | | | | 0.15 | 0.14 |
| **INTEREST RATE** | | | | | | | -0.22 |
| *t Stat* | | | | | | | -1.54 |
| *P-value* | | | | | | | 0.13 |
| **F Statistics** | 2.14 | 1.12 | 0.77 | 0.57 | 0.47 | 0.75 | 0.99 |
| **F-sig** | 0.15 | 0.33 | 0.51 | 0.68 | 0.80 | 0.61 | 0.45 |
| **Adjusted R Square** | 0.01 | 0.00 | -0.01 | -0.02 | -0.03 | -0.02 | 0.00 |

Above Table-4.24 indicates that market premium is not significant positively related to portfolio returns for woollen sector. Over all model is not fit as F Statistics is less than the tabulated values. Addition of leverage premium in conventional CAPM does not improve the results above. Table shows that the variables are unable to explain the relationship as model is not fit.

Table 4.25 presented a brief summary of impact of the industry specific and macroeconomic variables on stock market returns of 20 sectors. Returns of 17 sectors among 20 sectors are significantly affected by these variables having the highest values for adjusted R square .037 and the lowest values of .10, but as for the results of 3 sectors which are RP9, RP17 and RP20 (leather, tobacco and woolen) found less or no impact of industry specific as well as macroeconomic variables, having adjusted R square values of .04, .01 and .00 respectively which I quite low as compared to the remaining 17 sectors. Small size of these sectors with respect to number of companies is a reason of insignificant results.

## Table – 4.25: Summarized Regression Analysis of All Sectors for the period of 2002-2009

| | RP1 | RP2 | RP3 | RP4 | RP5 | RP6 | RP7 | RP8 | RP9 | RP10 | RP11 | RP12 | RP13 | RP14 | RP15 | RP16 | RP17 | RP18 | RP19 | RP20 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **INTERCEPT** | 0.07 | 0.07 | 0.08 | 0.07 | 0.05 | 0.06 | 0.05 | 0.09 | 0.03 | 0.06 | 0.07 | 0.05 | 0.09 | 0.09 | 0.05 | 0.04 | 0.07 | 0.10 | 0.08 | 0.05 |
| *t Stat* | 2.38 | 3.44 | 4.09 | 3.15 | 3.12 | 4.29 | 4.16 | 3.26 | 1.27 | 3.56 | 3.76 | 2.39 | 2.79 | 2.86 | 3.14 | 2.82 | 2.42 | 3.21 | 2.48 | 1.43 |
| *P-value* | 0.02 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.21 | 0.00 | 0.00 | 0.02 | 0.01 | 0.01 | 0.00 | 0.01 | 0.02 | 0.00 | 0.02 | 0.16 |
| **RM-RF** | 0.11 | 0.08 | 0.11 | 0.07 | 0.07 | 0.08 | 0.05 | 0.09 | 0.02 | 0.07 | 0.09 | 0.08 | 0.11 | 0.04 | 0.06 | 0.06 | 0.06 | 0.11 | 0.09 | 0.06 |
| *t Stat* | 2.98 | 2.84 | 3.65 | 2.11 | 3.44 | 3.83 | 3.00 | 2.38 | 0.52 | 2.92 | 3.15 | 2.58 | 2.50 | 0.90 | 2.69 | 2.56 | 1.52 | 2.38 | 1.96 | 1.42 |
| *P-value* | 0.00 | 0.01 | 0.00 | 0.04 | 0.00 | 0.00 | 0.00 | 0.02 | 0.61 | 0.00 | 0.00 | 0.01 | 0.01 | 0.37 | 0.01 | 0.01 | 0.13 | 0.02 | 0.05 | 0.16 |
| **LEVERAGE PREMIUM** | 0.39 | 0.32 | 0.31 | 0.17 | 0.35 | -0.12 | 0.40 | 0.40 | 0.33 | -0.06 | 0.35 | 0.43 | 1.23 | 0.96 | 0.58 | 0.62 | -0.22 | 0.77 | 0.66 | -0.49 |
| *t Stat* | 0.84 | 1.01 | 0.88 | 0.45 | 1.43 | -0.49 | 1.84 | 0.91 | 0.88 | -0.21 | 1.07 | 1.13 | 2.36 | 1.80 | 2.03 | 2.38 | -0.45 | 1.45 | 1.27 | -0.91 |
| *P-value* | 0.40 | 0.32 | 0.38 | 0.65 | 0.16 | 0.62 | 0.07 | 0.37 | 0.38 | 0.83 | 0.29 | 0.26 | 0.02 | 0.07 | 0.04 | 0.02 | 0.65 | 0.15 | 0.21 | 0.36 |
| **DIVIDEND PREMIUM** | -0.93 | -0.30 | -0.67 | -0.63 | -0.63 | -0.33 | -0.69 | -0.14 | -0.58 | -0.69 | 0.14 | -0.51 | 0.65 | -0.09 | -0.22 | -0.47 | -0.58 | -0.37 | -0.36 | -0.17 |
| *t Stat* | -2.59 | -1.19 | -2.48 | -2.14 | -3.29 | -1.72 | -4.02 | -0.41 | -1.95 | -2.96 | 0.55 | -1.72 | 1.59 | -0.21 | -1.02 | -2.33 | -1.55 | -0.89 | -0.88 | -0.42 |
| *P-value* | 0.01 | 0.24 | 0.01 | 0.03 | 0.00 | 0.09 | 0.00 | 0.68 | 0.05 | 0.00 | 0.58 | 0.09 | 0.11 | 0.84 | 0.31 | 0.02 | 0.12 | 0.37 | 0.38 | 0.68 |
| **F X Rate** | 1.92 | 1.24 | 2.16 | 1.25 | 1.41 | 1.10 | 0.42 | 0.83 | 1.22 | 0.10 | 2.25 | 1.18 | 2.86 | -4.24 | 0.39 | -0.44 | -0.02 | 0.77 | 3.53 | -0.07 |
| *t Stat* | 1.50 | 1.41 | 2.24 | 1.20 | 2.07 | 1.62 | 0.69 | 0.68 | 1.17 | 0.13 | 2.47 | 1.11 | 1.98 | -2.87 | 0.50 | -0.61 | -0.02 | 0.52 | 2.44 | -0.05 |
| *P-value* | 0.14 | 0.16 | 0.03 | 0.23 | 0.04 | 0.11 | 0.49 | 0.50 | 0.25 | 0.90 | 0.02 | 0.27 | 0.05 | 0.01 | 0.62 | 0.54 | 0.99 | 0.61 | 0.02 | 0.96 |
| **INFLATION** | 2.62 | 0.01 | 0.98 | -0.91 | 1.52 | 0.55 | -0.51 | -0.75 | 0.19 | -0.51 | 0.57 | 1.29 | 1.02 | -3.98 | 0.21 | -1.39 | -0.78 | -0.47 | 0.58 | -0.10 |
| *t Stat* | 1.42 | 0.01 | 0.70 | -0.60 | 1.56 | 0.56 | -0.58 | -0.42 | 0.12 | -0.43 | 0.43 | 0.85 | 0.49 | -1.87 | 0.19 | -1.34 | -0.41 | -0.22 | 0.28 | -0.05 |
| *P-value* | 0.16 | 0.99 | 0.48 | 0.55 | 0.12 | 0.58 | 0.56 | 0.67 | 0.90 | 0.67 | 0.67 | 0.40 | 0.62 | 0.07 | 0.85 | 0.18 | 0.68 | 0.83 | 0.78 | 0.96 |
| **MONEY GROWTH** | -0.24 | -0.27 | -0.38 | -0.19 | -0.19 | -0.19 | -0.14 | -0.27 | -0.05 | -0.07 | -0.12 | -0.28 | -0.36 | -0.34 | -0.10 | 0.03 | -0.07 | -0.25 | -0.16 | -0.40 |
| *t Stat* | -1.07 | -1.70 | -2.21 | -1.01 | -1.60 | -1.60 | -1.25 | -1.24 | -0.24 | -0.47 | -0.74 | -1.50 | -1.40 | -1.29 | -0.69 | 0.23 | -0.30 | -0.95 | -0.62 | -1.51 |
| *P-value* | 0.29 | 0.09 | 0.03 | 0.31 | 0.11 | 0.11 | 0.22 | 0.22 | 0.81 | 0.64 | 0.46 | 0.14 | 0.17 | 0.20 | 0.49 | 0.82 | 0.77 | 0.34 | 0.54 | 0.14 |
| **INTEREST RATE** | -0.12 | -0.10 | -0.18 | -0.08 | -0.19 | -0.14 | 0.03 | -0.14 | 0.01 | -0.10 | -0.05 | -0.15 | -0.05 | -0.02 | -0.06 | -0.02 | -0.08 | -0.12 | -0.10 | -0.22 |
| *t Stat* | -0.95 | -1.23 | -1.94 | -0.77 | -2.92 | -2.12 | 0.48 | -1.15 | 0.08 | -1.21 | -0.60 | -1.45 | -0.33 | -0.17 | -0.76 | -0.33 | -0.64 | -0.87 | -0.73 | -1.54 |
| *P-value* | 0.35 | 0.22 | 0.06 | 0.44 | 0.00 | 0.04 | 0.63 | 0.25 | 0.94 | 0.23 | 0.55 | 0.15 | 0.75 | 0.86 | 0.45 | 0.74 | 0.52 | 0.39 | 0.47 | 0.13 |
| | | | | | | | | | | | | | | | | | | | | |
| **F Statistics** | 4.57 | 4.21 | 7.78 | 3.64 | 9.09 | 5.55 | 8.17 | 2.58 | 1.51 | 4.30 | 4.40 | 3.75 | 3.76 | 2.71 | 3.56 | 5.69 | 1.14 | 2.83 | 3.57 | 0.99 |
| **F-sig** | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.02 | 0.17 | 0.00 | 0.00 | 0.00 | 0.00 | 0.01 | 0.00 | 0.00 | 0.35 | 0.01 | 0.00 | 0.45 |
| **Adjusted R Square** | 0.21 | 0.19 | 0.33 | 0.16 | 0.37 | 0.25 | 0.35 | 0.10 | 0.04 | 0.20 | 0.20 | 0.17 | 0.17 | 0.11 | 0.16 | 0.26 | 0.01 | 0.12 | 0.16 | 0.00 |

# Discussion and Conclusion

This study explored the influence of leverage premium, dividend premium and macroeconomic variables on sectoral returns. Macroeconomic variables include change in foreign exchange rate, money growth rate, inflation rate and change in interest rate. Twenty non-financial sectors are selected from Karachi Stock Exchange and on sectoral wise portfolios sector wise were created. In different previous studies conducted in different equity markets around the globe it has been found that there is a significant relationship between returns and market premium i.e. simple capital asset pricing model is capable of forecasting returns, these studies include prominently Black, Jensen, and Scholes (1972), Fama and MacBeth (1973) and Blume and Friend (1973). Other studies identified the gaps in capm in explaining returns i.e. Cheng (1995), Poon et al (1991), Chen et al (1986), Chan et al (1991), Fama and French (1992,1993,1995,1996), Lee (1992), Kaneko et al (1995) they all found out that only single beta is not sufficient for explaining the returns other, factors should also be accounted for which affect returns.

This study was aimed to explain the sectoral returns with the help of dividend premium, leverage premium and macroeconomic variables. Sector wise portfolio returns were regressed on market premium, leverage premium, dividend premium, and change in foreign exchange rate, inflation, money growth rate and interest rate. In cement sector market premium only explains 14% of return and explanatory power increases to 17% by adding leverage premium and it increases to 20% with addition of dividend premium. Cement industry returns are not significantly influenced by macroeconomic variable but the explanatory power is slightly enhanced by the addition of macroeconomic variables. In automobile parts sector adjusted R2 for the period of 2002-2009 is 14% that indicates towards a change in sector returns due to market premium adjusted R2

increases to 16% and 16 % with the addition of leverage premium and dividend premium respectively which indicates to the increase in the variation in sectored returns for leverage premium but not for dividend premium. Automobile parts industry returns are not significantly influenced by macroeconomic variable but the explanatory power is slightly enhanced by the addition. In automobile assembler sector adjusted R2 for the period of 2002-2009 is 21% that indicates towards a change in sector returns due to market premium adjusted R2 increases to 23% and 26 % with the addition of leverage premium and dividend premium respectively which indicates to the increase in the variation in sectored returns. Automobile assembler industry returns are not significantly influenced by macroeconomic variable but the explanatory power is slightly enhanced by the addition except for change in foreign exchange rate and money growth rate which increases the explanatory power form 26 % to 29 % and 31% respectively. In cables and electrical goods sector adjusted R2 for the period of 2002-2009 is 10% that indicates towards a change in sector returns due to market premium adjusted R2 increases to11% and 15 % with the addition of leverage premium and dividend premium respectively which indicates to the increase in the variation in sectored returns. cables and electrical goods industry returns are not significantly influenced by macroeconomic variable but the explanatory power is slightly enhanced by the addition. In chemicals sector adjusted R2 for the period of 2002-2009 is 19% that indicates towards a change in sector returns due to market premium adjusted R2 increases to 25% and 30 % with the addition of leverage premium and dividend premium respectively which indicates to the increase in the variation in sectored returns. Chemicals industry returns are not significantly influenced by macroeconomic variable but the explanatory power is slightly enhanced by the addition except for interest rate which significantly increases the explanatory power from 30 % to 37%. In pharmaceutical sector adjusted R2 for the period of 2002-2009 is

20% that indicates towards a change in sector returns due to market premium adjusted R2 does not increase with the addition of leverage premium and dividend premium which indicates no increase in the variation of sectored returns. Pharmaceutical industry returns are not significantly influenced by macroeconomic variable but the explanatory power is slightly enhanced by the addition except for interest rate which significantly increases the explanatory power from 20 % to 25%. In food & personal care products sector adjusted R2 for the period of 2002-2009 is 15% that indicates towards a change in sector returns due to market premium adjusted R2 increases to 23% and 35 % with the addition of leverage premium and dividend premium respectively which indicates to the increase in the variation in sectored returns. Food & personal care products sector industry returns are not significantly influenced by macroeconomic variable but the explanatory power is slightly enhanced by the addition. In jutes sector adjusted R2 for the period of 2002-2009 is 10% that indicates towards a change in sector returns due to market premium there is no significant influence of leverage premium and dividend premium which indicates no increase in the variation of sectored returns. Jutes industry returns are not significantly influenced by macroeconomic variable but the explanatory power is slightly enhanced by the addition. In leather & tanneries sector adjusted R2 for the period of 2002-2009 is 2% that indicates towards a slight change in sector returns due to market premium there is no significant influence of leverage premium, dividend premium increases the explanatory power of the model by 3%. leather & tanneries industry returns are not significantly influenced by macroeconomic variable but the explanatory power is slightly enhanced by the addition. In miscellaneous sector adjusted R2 for the period of 2002-2009 is 14% that indicates towards a slight change in sector returns due to market premium there is no significant influence of leverage premium, dividend premium increases the explanatory power of the model from 14 % to 21%. Miscellaneous industry returns

are not significantly influenced by macroeconomic variable but the explanatory power is slightly enhanced by the addition. In oil and gas sector adjusted R2 for the period of 2002-2009 is 17% that indicates towards a change in sector returns due to market premium adjusted R2 does not increase with the addition of leverage premium and dividend premium which indicates no increase in the variation of sectored returns. Oil and gas industry returns are not significantly influenced by macroeconomic variable but the explanatory power is slightly enhanced by the addition of change in foreign exchange rate which significantly increases the explanatory power from 16 % to 22%. In Power Generation & Distribution sector adjusted R2 for the period of 2002-2009 is 11% that indicates towards a slight change in sector returns due to market premium there is no significant influence of dividend premium, leverage premium. Power Generation & Distribution industry returns are not significantly influenced by macroeconomic variable but the explanatory power is slightly enhanced by the addition. In refinery sector adjusted R2 for the period of 2002-2009 is 10% that indicates towards a change in sector returns due to market premium adjusted R2 increases to 12% and 15 % with the addition of leverage premium and dividend premium respectively at 90% confidence level which indicates to the increase in the variation in sectored returns. Refinery industry returns are not significantly influenced by macroeconomic variable but the explanatory power is not enhanced by the addition except for change in foreign exchange rate which significantly increases the explanatory power from 15% to 18%. In oil and gas exploration sector market premium is not significantly and positively related to portfolio returns However explanatory power of model is not sufficient for oil and gas exploration sector as evident from adjusted R2 which is negative it indicates the possibility of others explanatory variables should be explained so above mentioned industry and macroeconomic variables were introduced to the model, it is found that leverage premium is

priced in Pakistan. Returns are not significantly influenced by dividend premium. Oil and gas exploration products industry returns are not significantly influenced by macroeconomic variable but the explanatory power is slightly enhanced by the addition. Its also may be noted that foreign exchange rate has a significant impact on the returns for oil and gas exploration sector. In sugar allied parts sector adjusted R2 for the period of 2002-2009 is 12% that indicates towards a change in sector returns due to market premium adjusted R2 increases to 18% with the addition of leverage premium and dividend premium has no significant effect on sectored returns. Sugar allied industry returns are not significantly influenced by macroeconomic variables there is no increase in explanatory power by the addition. In textile spinning sector adjusted R2 for the period of 2002-2009 is 12% that indicates towards a change in sector returns due to market premium adjusted R2 increases to 22% and 27 % with the addition of leverage premium and dividend premium respectively which indicates to the increase in the variation in sectored returns. Textile spinning industry returns are not significantly influenced by macroeconomic variable there is no increase in explanatory power by the addition. In Tobacco sector adjusted R2 for the period of 2002-2009 is 4% that indicates towards a slight change in sector returns due to market premium there is no significant influence of dividend premium and leverage premium. Tobacco industry returns are not significantly influenced by macroeconomic variable there is no increase in explanatory power by the addition. In transport sector adjusted R2 for the period of 2002-2009 is 10% that indicates towards a slight change in sector returns due to market premium, addition of leverage premium increases the explanatory power of the model to 14% there is no significant influence of leverage premium. Transport industry returns are not significantly influenced by macroeconomic variable there is no increase in explanatory power by the addition. In Technology and Communication sector adjusted R2 for the period of 2002-2009

is 11% that indicates towards a slight change in sector returns due to market premium there is no significant influence of dividend premium, leverage premium. Technology and Communication industry returns are not significantly influenced by macroeconomic variable but the explanatory power not enhanced by the addition except for change in foreign exchange rate which significantly increases the explanatory power from 12% to 18%. In woollen sector adjusted R2 for the period of 2002-2009 is 1% that indicates towards a slight change in sector returns due to market premium there is no significant influence of dividend premium and leverage premium. Woollen industry returns are not significantly influenced by macroeconomic variable there is no increase in explanatory power by the addition.

# Further Research

CAPM and its extensions, Fama and French models are one of those fields of finance which can never be worn out or become history with continuous research. The more and more time passes it helps in pooling of information and data which has a key beneficial importance in the continuous study of the significance of this model and its preference. Additional research in this area would always be tremendously helpful in the understanding and implementation of the model. Apart from the company specific variables such as dividend premium and leverage premium other variables should also be explored that could increase its explanatory power, and capture the variation in excess returns that the model is unable to predict. Similarly adding of macroeconomic factors which not have been undertaken by this study such as oil prices, unemployment rate, industrial production might also enhance the explanatory power. Furthermore this study could also be enhanced to financial sector also.

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