Volatility, Risk & Return Relationship among Commodity Market and Economic Growth

Ahmed Imran Hunjra¹, Misbah Mukhtar² and Imran Siddique³

Abstract
This research is based on the volatility and risk & return relationship among commodity market and economic growth of Pakistan. Objective of this study is to check whether commodity market has any relation with economic growth or not. If it has any relationship then it is important to know what type of relationship is that. For that purpose monthly data of GDP, rice, tea, crude oil, gold has been collected from 2001 to 2011 from government authentic websites. Three tests are applied on data that is descriptive statistics, unit root test, and ARCH, GARCH model which is used to analyze significant relationship among commodity market and economic growth. Results supported hypothesis which shows that dependent variable (GDP) have significant relationship with independent variables (gold, rice, crude oil, tea) and all commodities are positively related with GDP, except tea which show significant relationship but that relation is negative.

Keywords: Economic growth, GDP, Commodity market, volatility, risk, and return.

I. Introduction
Volatility means amount of uncertainty about the upward and downward movement of security value. A higher volatility assumes that a security's value can potentially be extended over a larger range and a lower volatility means that the security values does not fluctuate adversely, rather than changes will happen at a steady pace over a period of time. Volatility is believed to play an important role in accelerating pricing and hedging, selecting optimal portfolio, and management of risk. Predicting and rationalizing volatility is an active and challenging dimension of research in the finance. There has been a phenomenon of high level volatility in the past few years in established and rising financial markets across the world. Financial experts and investors consider the uncertainty, due to the volatility in market prices and the unsteadiness of business performance, of the returns on their investment assets, recent developments in financial econometrics urge the use of quantitative models that are capable to describe the inclination of investors towards risks, volatility and expected returns. This calls for models that are sufficient for dealing with the volatility of the market (series) (Griffin and Boomgaardt, 1999). It is believed that different commodity prices increases day by day. Volatility in these prices is due to many economic problems like inflation, political instability etc. This volatility will affect return of commodity market.

The connection between risk and return in the financial markets is widely studied in financial economics. Although the risk-return relationship is of primary importance in the economy, the empirical asset pricing literature has not yet concluded into an agreement on the existence of such a positive risk-return trade off for stock market indices. The relationship between return and risk, as it is most of the times defined by the

1 Lecturer, UIMS-PMAS-University of Arid Agriculture Rawalpindi, and PhD Scholar Iqra University Islamabad, Pakistan
2 BBA Student, UIMS-PMAS-University of Arid Agriculture Rawalpindi, Pakistan
3 BBA Student, UIMS-PMAS-University of Arid Agriculture Rawalpindi, Pakistan
variance or standard deviation, is widely examined in the literature of finance. The relationship between risk and return is a significant factor in all human decision making. Each investment a firm undergoes, for instance, must be as profitable as return on an equally risky investment on financial markets. Otherwise investors would like to invest in the financial markets rather than in the firm. In this study it is checked that, whether there is any risk and return relationship exist among commodity market and economic growth or not. The risk and return relationship are determined in GARCH-in-Mean approach.

Commodity market is a market where raw material or primary products are exchanged. These raw or primary commodities are traded on regulated commodity exchanges. In exchanges they are bought and sold at standardized contract. This research is on commodity market of Pakistan. Pakistani Commodity market is also called Mercantile Exchange Market. Pakistan mercantile exchange latterly changes its name to National Commodity Exchange market and it is also known as commodity exchange market. It is the first future commodity market in Pakistan having its registered head office in Karachi and is regulated by security exchange commission of Pakistan (SECP). It is only company in Pakistan to provide centralized and regulated place for commodity future trading. It started trading activities on 11th May 2007.

Pakistan mercantile exchange or commodity market is technological driven web based, and demutualized commodity exchange. It is the first commodity exchange in Pakistan which employs modern risk management techniques. These risk management techniques based on value at risk with pre trade risk check in real time, and acts as central counterparty to both buyer and seller through exchange of old with once (novation process) and it also provides clearance and settlement on T+0 through online banking process mechanism. This exchange recently changes its working time, now it operates for 21 hours. This increase in working hours is very important as international market tapping very fast, So to get opportunity to be part of the global activity from the regulated platform. Where they can benefited from commodity prices trends and they can also hedge their trades. The membership of commodity market is open for everyone; there are 300, plus members of commodity market now in Pakistan but its numbers increasing day by day. Members include brokerage houses, individuals and industrial specialist are also its members that are ranging from traders to exporters, importers, and industrial specialists. Pakistan Commodity market has an institutional shareholding. Shareholders of commodity market include National Bank of Pakistan, Karachi, Lahore and Islamabad Stock Exchange, Zarai Tarakiyati Bank and Kuwait Investment Company.

Pakistan Commodity market first started its trading of Gold, after this additional products were launched that are rice on March 2008, Palm oilen future in June 2008, silver and crude oil in November 2009, sugar in June 27, 2011 but main commodities exchanges were Gold, Silver and Crude oil.

Various Gold contracts are
- Gold 1 ounce
- Gold 100 ounce
- Gold 1 Tola
- Gold 50 Tola
- Gold 100 Tola
- Gold Kilo
- Gold 100 gms
- Mini gold 10 gms

Categories Silver contracts are
- 100 ounce
- 500 ounce

Categories Crude Oil contracts are
- 10 Barrels
- 100 Barrels
Technical setup of this exchange is provided by Karachi stock exchange the biggest stakeholder, trading is also facilitated by other two stock exchanges along with universal access by web portal. Karachi stock exchange is the largest shareholder having 40% share. The Islamabad and Lahore stock exchanges that are remaining two stock exchanges have 10% each and there is also other shareholder. The automated trading system of commodity exchange provides market participants with online market and price discovery system guaranteed the best bid and offer prices for all market members and This commodity exchange market also provides plan to give number of services to broker including trading terminals at remote places it also provides online market information system, clearance and settlement and comprehensive risk management system. It is not said that derivative market totally eliminates the risk in the commodities because there are some certain uncontrollable events or risks such as weather, production level and demand during a session, it can be minimized. The commodity exchange of Pakistan introduces an efficient clearing funds management system and it adopted comprehensive risk management system and practices in the commodity market of developed world.

The commodity exchange of Pakistan is the only exchange market in Pakistan that provides centered and controlled place for commodities traded in Pakistan. This exchange has small initial paid up capital of Rs. 50 million and it has raised an additional paid up capital of Rs. 260 million by giving license to 260 to brokers at amount of 1 million each. Therefore the cash equity of Rs. 360 million is used to develop infrastructure necessary to develop fully automated trading.

Participants involve in commodity market are

- Importer and exporter
- Financer of commodity
- Producer or farmer
- Consumers
- Traders
- Corporate that have risk exposure in commodities

The commodity prices are less unpredictable than stocks that are why it is less risky to invest in commodities. It has also been proved by researchers. It is safer to invest in commodity market and good option for risk averse people. The regulatory bodies at NECL and SECP ensure through continues monitoring that the commodity prices and demand and supply driven and free from exploitation. Finally this commodity exchange aims to establish, regulate and control businesses of future commodity contract within and outside the Pakistan, and to perform all joined and incidental functions to facilitate. This commodity exchange also regulate the handling exportation from and importation of commodities into country from it warehouse headquartered that is located in Karachi and Bin Qasim.

It is actually a positive change in the level of goods and services produce by any country over a period of time. Here we are focusing on nominal economic growth; Nominal economic growth is growth with inflation. The economic growth is measured as the annual percent change of growth domestic product. It can also be defined as the increase in the capacity of a country to produce goods and services from one period to another period. For example if a country’s GDP of one year is $100 billion and in next year GDP will become $125 billion then economic growth of that company will be 25 percent. Most of the people consider economic growth to be one of the reliable sign of the country’s overall health. More trading activities means more jobs and more jobs means more consumption which leads to more production so from that a circle will formed. The countries are concerned about economic growth because they desire to improve their country’s standard of living which is the level of goods and services that an average individual can purchase or otherwise gain access to. It is noted that if population is grown along with the economic growth then result in increase in GDP will not result in the improvement of standard of living. When focus is on improving standard of living then economic growth is expressed in per capita basis, per capita income
is average income or income per person. It is the measure of the mean income within economic aggregate such as country or city. Per capita income is used to measure the prosperity of that country.

Growth domestic product provides aggregate measure of the changes in value of goods and services produced by a country. Growth domestic product in Pakistan expanded 3.04% in 2010/2011 fiscal year. Until 1952 to 2011 Pakistan average growth rate reached 5% and all time high of 10.2% in June of 1954 and low of -1.8% in June of 1952. The economy of Pakistan in nominal term is in 43rd number in the world and it is 28th largest in world in PPP (purchasing power parity). Pakistan GDP is $300 billion in 2011 according to government figures which means Pakistan economy is 35th largest in the world. GDP growth is 3.7% in 2012, and GDP per capita is $1254 nominal in 2011. GDP by sector in Agriculture 21.2%, industry 25.4% and services 53.4% in 2011. Inflation rate is 16.17% in 2009-2010. Inflation remains the biggest problem in Pakistan, which create biggest threat to economy of Pakistan. But from past few decades Pakistan economy is adversely affected by fast growing of population, mixed level of foreign investment, political instability, inflation, unemployment etc. Export of Pakistan in 2011 is $30.9 billion and export goods are textile (garments, bed linen, cloth, yarn) rice, leather goods, sports goods, chemicals, manufacturer, carpets and rugs. Imports are 39.9 billion in 2011 and import goods are petroleum, petroleum goods, machinery, plastic, transportation equipment, edible oils, paper and paperboard, iron, steel, tea. Revenues in 2011 are $26.7 billion but expenses are 39.9 billion in 2011, here it is concluded Pakistan economy is not performing good as its expenses are more than income, its imports are also more than exports its means Pakistan is relying more on other countries.

Due to inflation and many other many economic crises worldwide, economy of Pakistan has been suffering from balance of payment crises. The IMF bailed out Pakistan in November 2008 to prevent a balance of payment crises and increased the loan. During mid of 2000 Pakistan experienced an enormous growth averaging 7% GDP growth in 2003 to 2007. In October 2007 Pakistan raised its foreign reserve up to 16.4 billion but in 2008 crises, Pakistan economy is adversely affected its currency value decreases because of political instability and foreign investors withdrew their investments because of fear of default.

There are some factors that affect economic growth and economic development. These are:
- Interest Rate
- Currency Strength
- Government Intervention
- Environmental Impact.

Inflation is increasing day by day but it was estimated that inflation will reduce in 2010 and growth will be up to 5% per annum by 2011, although that growth was less than previous five years that was average 7% but after coming out of crisis growth were 3.5 or 3.4%. As from the economic comparison of Pakistan per capita income which tells about the prosperity of any country, is decreasing, it shows prosperity of Pakistan is decreasing day by day. There are lot of reasons that give adverse impact on the Pakistan economy that is political instability, unemployment, inflation, low currency value, decrease in foreign investment and many more.

II. Literature Review
The connection between the commodity market and the economic growth has been widely studied in different articles and in different perspectives. The study regarding the growth of economy has been conducted in many countries such like in the article named Commodity Prices and Growth in Africa etc. In the present study the literature review regarding the commodity market and about the economic growth has been done separately. The commodity market has a great effect on the economic growth of any country. The agriculture goods have a significant relation with the growth of the Pakistan (Raza, Ali and Mehboob, 2012) concluded that the crops and live stocks have 91% contribution (the fisheries and forestry have minimal contribution because of low investment, untrained and unskillful labor force) in the economic
growth of Pakistan or in the GDP of Pakistan. The major crops have 31% share over aggregate agriculture share, minor have 11% and the livestock has 55% share. In another article that is Economic Growth and Management of Natural Resources the authors discuss that either the natural resources have long term relations with the economic growth of any country or not. After discussing this point by various perspectives the authors reached at the conclusion that natural resources have long term relationship with the economic growth (Hye and Siddiqui, 2010) and also they concluded the positive correlation between natural resources and economic growth existence.

The present study is related to the commodity market and the economic growth so that the emphasis will be on the factors that can influence the risk and return of the commodity market. The volatility in the risk and return in the commodity market can influence the economic growth of any country therefore we can say, that the commodity market is very sensitive and it is greatly influenced by any extreme news and any economic announcement because of Commodity markets are markets where raw products such as oil, food, precious metals, etc. are exchanged. Similar study was conducted that showed the effect of extreme news and events on the economic growth. After the whole analysis the authors reached at the result that the economic shocks and the political news identify the existence of outliers (Hua and Went, 2009). The authors suggest that if the impact of extreme events removes then the return and volatility estimates can be improved.

In case of the Pakistan commodity market, Pakistan produces high quality cotton and it is famous for the exporter of cotton. Therefore, the study has been conducted to show the impact of global market on rural poverty in Pakistan. According to the authors as they used a hypothesis that the increase in rural poverty in Pakistan is due to the adverse effect in the world commodity prices specially cotton. The result of the study was that when the prices of global commodity market changes so, all the cotton producing households on the base of per capita consumption are below the poverty line by 40%. Among land owners, they are below poverty line by 34% and the sharecroppers are below the poverty line by 57% (Orden, Salam, Dewina, Nazli and Minot, 2006). According to their study, estimation was that if the prices of global commodity market increase by 20%, then the poverty among the sharecropper’s households producing cotton will be lower that is 56% to 58% in Punjab and 38% to 45% in Sindh. Among all cotton producing households the poverty will be fall from 40% to 28% and among land owners the poverty will be fall from 32% to 43% in Punjab and 22% to 25% in Sindh.

Different studies have been conducted by the researchers in different countries for the purpose of establishing price mechanism for commodity market. The same study of Price mechanism for commodity market was described by the Indian author. After applying the methodology for the purpose to establishing price mechanism, the authors realized that the result shows the price mechanisms, effective for some commodities but for other products it’s not effective. Causality can be used for the forecasting like to hedge the price movements. Their study shows that in both cases the efficient hedging strategies can be formulated that are, if changes in spot prices drive changes in futures prices and if changes in future prices drive changes in spot prices (Dash and Andrews, 2010).

The risk and return of commodity market have also been studied in the Pakistan but it was related to the stock market. While, this research paper relates the risk and return of commodity market to the economic growth of Pakistan. The previous study was in the perspective of risk and return of commodity market prices and stock market. The overall results indicate that asymmetric and seasonal effect is present in commodity market and stock market. But in both markets the result is more dominant only on stock market, it means the seasonal effect is more dominant on stock market rather than on commodity market (Hunjra, Azam, Niazi, Butt, Rehman and Azam, 2011).

The effect of change in dollar prices also have a great impact on the commodity market because many commodities are compared or priced in dollar value i.e. oil. So when the dollar value increases, it means...
that as the dollar appreciates, so it puts the downward pressure on the commodity prices. Therefore as the result most of the people invest in stocks rather than in commodity market. It ultimately affects the economic growth (August 23, 2011).

According to the SOCO (state of agriculture commodity market), the impact of price fluctuation of commodity market is more in poorest countries and the real prices of agriculture goods especially real prices of horticulture products have declined over 40 years. Another finding was that the supply of global commodity was growing more rapidly than the demand of global commodity (February 15, 2005).

In case of sustainable growth the study was conducted by the Indian author and according to him there were various risks management practices and tools in India for the sustainable growth. The finding was that the Indian agriculture commodity market should be prepared for international competition, if the prices are good and bring the high valued crops so the risk averseness can be reduced (Roy, 2006). Banks should give facility of risk management and for sharing tools like commodity financing, derivative markets ware house receipt financing etc. The banks should also provide the future market so that the risk can be hedged in this way.

The studies regarding the economic growth are so many in numbers, by taking different factors for the base, the authors have found the relationship that either it has a positive relationship with the economic growth or has a negative relationship. The study regarding this perspective was the Stock and Credit Market Expansion and Economic Development in Emerging Markets. The author emphasis was on equity and the credit market development and the economic growth by taking the five emerging markets. The result of the study shows that in some countries the equity market effects the growth but on the other side it also does not support in some countries. Like in liberalized economies, the equity market has a role to play for growth i.e. in Chile and Mexico. While in the India the equity markets don’t affect the real growth of the economy. The equity and credit market both affect the economic growth in South Korea. The results for the credit markets has been explained by Authors as when the banking crises came in Chile and Mexico during 1980s and 1990s, that there is a negative relation between credit market and economic growth. The further finding was that those countries whose stock markets are speculative in nature they have a negative relation between equity market development and economic development (Spyrous, 2001).

The economic growth of any country shows that how much the country has reserves and how much the country’s population is rich and in what style they spend their lives etc. Therefore, the study regarding economic growth is important to study from the point of literature review. Similar study explains the relationship of remittances, financial markets and economic growth. The study indicates that remittances can have positive relationship with economic growth in the long run. Therefore, the author concluded the three results. Firstly the remittances significantly affect the economic growth. Secondly, if the financial markets properly develop then the remittances can bring the further growth in economic development because if both factors are present so it removes the financing constraints on both individuals and the firms and as a result the economic growth increases. Thirdly, when the remittances are included in the growth equation then the effect of investment per capita on growth increases (Mundaca, 2008). Finally the study shows that if the financial services generally available then they lead to better use of remittances, therefore the growth of country increases.

Financial development also has a relation with economic growth therefore the similar study has been conducted in Pakistan that describes the relationship between the financial development and economic growth. The study has findings in two perspectives i.e. in short run and in long run. In the long run, the financial depth and the real interest rate has a positive relationship with economic growth while in the short run, as the change in investment occurs then the economic growth is positively and significantly affected by this (Khan, Qayyum and Sheikh, 2005). Further, change in real interest rate gives both positive and negative impact on economic growth and also the change in real interest rate is very small in short run. The
study’s result was consistent with this point that economic development cannot be possible without the financial development.

In the study of an evaluation of Pakistan’s growth strategy, the author has given more emphasizes on the point, that there is a need for Pakistan economy to go toward the side of growth. There is a huge amount of data regarding the growth process is present in the world but now this is the time to implement this data in Pakistan. The finding of the study was that the foreign resources have not worked, because according to the study the structure of incentives not worked and the talent and merit has no importance for this current system. Therefore the economists are emphasizing on developing the institutions which will give first priority to merit and talent. Because if such environment develops where the individuals are allowed to work as they want, they feel the freedom to work as they want. This type of environment will provide the security and facilitate the market transactions, so the success can be achieved because it is a meritocratic framework and here the success will be determined by the marketplace (Haque, 2006).

In case of empirical evidence from Pakistan the objective of the study is to see the long term equilibrium between the financial development, economic growth and international trade. After applying the different test the results were, that there was a long term relationship between the financial development, economic growth and international trade (Shaheen, Waqas, Awan and Aslam, 2011). Another finding was that there is a unidirectional causality present from financial to economic growth, from international trade to economic growth and from financial development to international trade. The conclusion was that the financial development must be enhanced like development of financial institutions and stock markets for the purpose of increasing the economic growth and should take serious attention to the policies in the long run so that the economic growth can be improved. Therefore Growth and Development in financial sector is thought to be the key factor of financial liberalization. It has also been concluded that the financial development and disbursement of credit by commercial banks has positive relation with economic growth which means that credit disbursement and financial development increase the economic growth.

The study is regarding the literacy that either the literacy affects the economic growth or not, has conducted in the New Zealand. In the study of adult literacy and economic growth the authors want to check that by increasing the basic literacy skills of adults either it has positive relationship or negative with economic growth. According to the study there are many benefits of the study or literacy i.e. when the person studies, it means they are becoming more literate and therefore can get the good jobs, the result would be the performance of the worker increases and the person will contribute in economic growth of the country (Johnston, 2004).

For the case of Pakistan and China the financial development and economic growth study concluded that there is a positive relationship of financial development and economic growth in case of Pakistan but in the case of china the results are positive for the deposit liability ratio but insignificant relationship was found for case of China when credit to private sector (Jalil and Ying, 2008). It is because of that the allocation of Chinese SOBs is not so much efficient. And the data was not good that is used for the proxy of financial development and it is not sufficient.

Due to role of efficient resources allocation the financial sector development affects the per capita GDP (Gross domestic product). The foreign capital does not stimulate domestic capital accumulation while by domestic capital the foreign capital can be attracted. The individual’s participation for increasing the economic growth has been studied by the Indian author and according to the study the author considers the two sides that are Government based environment and market based environment. The study shows that the market based environment encourages the individuals to do well and give their best so that the economic growth of the country increases under the market reforms (Klal and Clement, 2005). Therefore all those factors which can reduce the inflation and increased the economic growth can be included among other things.
In Pakistan commodity market, the Mango is the main fruit but it is not as much used as it can be because the threat of WTO (World Trade Organization). Therefore the similar study has been conducted by the authors to analyze the agriculture extension in Mango in the district of Multan and its production and marketing also considered in the study. There are different respondents for the mango in agriculture i.e. Agriculture officers, District officer, Horticulturists. But all of these people are not familiar with the agreements of World trade organization and in some cases the awareness is totally zero. The main threat of developing country is that the developed countries are well organized and well equipped for the production of mango fruit and it’s by products. Their study indicates the results that the major respondents have awareness regarding the World trade organization. But when the result are in percentage so the 25% to 100% respondents are not familiar with the World trade organization’s agreement i.e. Agreement on Services, Agreement on Goods, Agreement on Dispute Settlement and Agreement on Intellectual Property Rights, respectively. Besides this 75% of the respondents were aware of the Agreements on Agriculture. While 25.0%, 18.8% and 6.3% of the respondents were aware of main agreements related to agriculture like Agreement on Tariff and Trade, Agreement on Subsidies, Agreement on Government Procurement and Agreement on intellectual property rights (Hussain, Butt, Hassan and Javed, 2010).

The fluctuation in the Commodity prices has been problematic in their unstable impacts on the earnings of foreign exchange of developing countries. Presently, however, the focus has been drawn to their performance in spreading inflation and including macroeconomic and financial changes and their adjustments in DC (developed countries). These changes are in employment and change in money supply, interest rates, and exchange rates. It means the commodity sector has become the source of transmission of economic downturn from developed and industrial countries to peripheral economies and also the major cause of economic instability in the world economy (example of prime commodity petroleum caused disturbance in world trade in 1973). So the Authors (Labys and Mazels, 1990) showed and assessed the effect of commodity price fluctuations and their adjustments on the economic conditions of developed countries. The findings show that the fluctuation in commodity prices plays a positive role in the economic instability and the behavior of developed countries. It has also been showed that the commodity prices lead to changes in interest rate and to some extent, adjustments in money supply. The relation between wages and employment and commodity prices has been showed here to be strong.

Many developed countries largely depend on several commodities for their exports and government revenues. So if the commodity prices are subjected to change then or there is volatility in them, then it may impact country’s economic growth. Actually countries depending on commodities are negatively affected by the volatility in prices. Due to these uncertainties the study Commodity Risk Management and development have been conducted in Washington and gave the results that Commodity Prices instability has inverse relation on economic growth (Larson, Varangis and Nanae, 1998). Same the above study another study in Nigeria has been done that is the characteristics and behavior of commodity market and its consequences for economic growth but the results showed that the commodity market and its impact for economic growth have negative relation because of government intervention (Jerome and Ogunkola, 2000). Increase in commodity prices have been observed to be affected by different variables which play an important role in the economy of a country. The study has been conducted in Switzerland to analyze the effect of increase in commodity prices by telling the variables affecting the prices are dollar depreciation, demand for commodity, supply for commodity, participation of institutional investors and result suggested that institutional investors and speculators have impact in increase of commodity prices (Dema, 2009).

Some countries in Africa mainly depend on Commodity market for their survival. Approximately thirty-four countries in Africa depend on three commodity markets to economic development. So in Africa, commodity market got attention of researchers. In this regard one of the studies investigated the relationship between commodity market and economic growth in SSA (Sub-Saharan Africa) that there is an inverse relationship between commodity dependent countries and economic growth (Ocran, 2007).
Many studies have been conducted to show the correlation of commodity market and equity market. In India study resembling this, has also been conducted to check either there is any correlation between commodity market and equity market. If yes, then is it positive or negative. The study has been conducted to check the impact of performance of commodity market on equity market (Bhatt, 2010). Here it has been observed that when equity market performs badly, then commodities perform the best relative to other asset classes, but the correlation between equities and commodities remained lowest. That is 0.0 and 0.3.

It has been the perceptions that commodity price uncertainty causes problems for the countries which are developing and has been a problem for manufacturer and government also. But it was actually known that which specific commodity prices fluctuations matter to developing countries. For government it causes disturbances in budgetary strategies and for producers it is a continuous source of variable cash flows streams. All these reasons stop the economic growth. The particular research is about commodity price uncertainty and shocks implication for economic growth conducted at University of Oxford (Dehn 2000). The findings of the study show that there is an effect of ex post shocks and ex ante price variability on economic growth; the findings also show that the per capita development or growth rates are highly decreased by negative commodity price shocks. The study also shows that positive shocks have no effect or lasting impact on economic growth.

There are different opinions regarding the effects of population growth on economic growth. Some economists thought that the population growth is a problem while others viewed it as no concern with growth. Pakistani author has attempted to analyze the impact of population growth for economic growth (Afzal, 2009). Pakistan’s population has been increased by 430% in between 1950-2001. After the analysis the author has come to the results that the population growth and measure of economic advancement have negative relationship. The findings of the study also showed that the increase population growth is actually a problem because it lowers the investment growth and saving rate. Policy makers should invest in family planning services so that issues regarding population growth can be addressed easily.

Fiscal policies have role in Asian countries to stable the macroeconomic environment. It is taken as to reduce the S.R fluctuations in output and unemployment. Asian countries have standards of living and have different policies. Large Governments are supposed to be an obstacle to economic growth and efficiency because a large number of taxes demotivate the investors to invest and in this way investment opportunity. So the countries having large Government experience low economic growth. In this regard one of the studies study examines the impact of relationship between fiscal variables and economic growth in Asian countries.(Abdullah, Habibullah and Baharumshah,2009).The results over here showed a positive impact of health and education expenditure, aggregate of government expenditure and aggregate of other fiscal variables on real per capita GDP. Moreover the findings show that defense expenditure, taxation and budget balance are negatively related to real per capita GDP.

Researchers are now a days trying to find out different variables effecting the economic growth the most. Different studies found different variables affecting economic growth. The study has been conducted to examine the effect of education on economic growth. (Musai, Mehrara, Ardakani and Saybani, 2012) finds out one of those variables that is education. So in the research the effect of formal in primary, secondary, and tertiary education on long-term economic growth has been studied. Findings show that all of the above indices have negative effect on long term economic growth. Here it seems that long term final benefits of formal education are smaller or less than final investment expenses for education and it is the necessary requirement to revise the educational methods and structures for market need and cost effectiveness.

Many variables affect the economic growth. There is an effect of volatility of commodities terms on economic growth. One such paper has been established to investigate the effect of commodity market on economic growth and also on three growth channels that are total factor productivity, physical accumulation
and human capital acquisition (Cavalcanti, Mohaddes and Raissai, 2012). The results indicate that the volatility has negative impact on economic growth.

An increase in international oil prices has a great impact on economic growth of different countries. This increase and decrease have different impact on oil exporting countries and have different impacts on importing countries. An increase is considered as good news for exporting countries and bad news for importing countries. The research Impact of oil prices shock and exchange rate volatility on economic growth has been done in Japan to analyze the consequences (Jin, 2008). The main findings express that economic growth is negatively affected by the increase in oil prices in Japan and China and is positively affected in Russia. A 10% permanent increase in international level oil prices is associated with 5.16% growth in Russian GDP and 1.07% decrease in Japanese GDP. On one side the appreciation of real exchange rate gives a positive GDP growth in Russia and a negative GDP growth in Japan and China.

III. Theoretical framework:-
In this study it is analyzed whether there is any volatility and risk and return relationship among commodity market on economic growth or not. In this study economic growth is independent and commodity market is dependent variable. Picture of this study is given below,

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\text{Economic growth} = \text{Commodity market}
\]

\[
\text{Volatility, risk and return relationship}
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Detail picture of this study is given below

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\text{GDP} = \text{Gold price+ Tea+ Rice+ Crude oil prices (commodity market)}
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Y = B_0 + B_1(x_1) + B_2(x_2) + B_3(x_3) + B_4(x_4)
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The monthly data of the gold, tea, rice and oil prices along with the GDP was collected. The data regarding GDP was collected from World Bank organization website, and gold data was collected on monthly basis from forex.com and oil, rice, tea data was collected from index mundi website. The monthly values of independent variable (GDP) and dependent variables (Oil, rice, tea, and Gold) were gathered from January 2001 to June 2011. Yearly data of GDP then converted into monthly data using Eviews.
Raza, Ali, and Mehboob (2012) conducted the study on the role of agriculture in economic growth of Pakistan and collected data from 1980 to 2010 from the official websites of Government and the agriculture sub sector. The data has been collected by the statistical appendix and from the economic survey of Pakistan. After that the regression line has been used for getting the significant relationship between the role of agriculture and economic growth. Adnan, Hye, and Siddique (2010) conducted study on economic growth and management of natural resources after that they used data from 1971 to 2007. The data has been collected from the World Bank and other official websites and the authors used annual time series data from period 1971 to 2007. After the collection of data, the two models were used in their study to check the relationship between economic growth and natural resources that are JJ co-integration approach and the advance autoregressive distributed lag (ARDL). Further the study uses all these as controlled variables that are investment, human development, and openness.

For analyzing the impact of extreme event on commodity market the Hua and went (2009) conducted study and used outlier identification methodology, as there are many identification methodology i.e. Chien and lieu 1993 procedure that is general procedure and the authors also follow this approach. It’s described as ARIMA process. The authors focus was on sixteen commodity spot prices and the 25 commodity index series. The total observations were 2868 and the data was from January 1, 1997 to December 2007. Orden, Salam, Dewina, Nazli and Minot (2006) conducted study in order to analyze the impact of global cotton market on rural poverty in Pakistan and the authors used the simulation analysis in their study. As the authors evaluated the global cotton market impact on poverty of Pakistan so the cotton to the incomes of household was based on the HIES (Pakistan household integrated survey) 2001 to 2002.

Dash and Andrews (2010) conducted study on market behavior and they used the Granger causality technique to see the impact of future market on the spot market and vice versa by taking the twenty one commodities as a sample.

The authors Hunjra, Azam, Niazi, Butt, Rehman and Azam (2011) conducted study in order to check the risk and return relationship of stock market and commodity market. In their study, the authors used the monthly data for gold, cotton and sugar prices along with KSE 100 index. The data which was used in the study was from July 1988 to July 2008. GARCH-MEAN and E-GARCH modeling approach were used. The data regarding cotton and sugar were collected from Ministry of production. The ADL test was used in the study to check the stationary of the data. The Q test statistics and ARCH test were also applied in this paper to check the effect of volatility in returns. To overcome the problem of ARCH result, the GARCH model was applied.

Gabriela Mundaca (2008) conducted study on remittances, financial market development and economic growth and in the study the first-difference generalized method of moments (GMM) and the Sargan test from the GMM estimator was used. Khan, Qayyum and Sheikh (2005) conducted study on financial sector development and economic growth for the developing countries. In their study, the authors used the panel data set for the thirty five countries. The data is from 1970 to 2003. In the study the role of financial sector development is analyzed through its effects on the domestic and foreign capital accumulation. The whole analysis was based on the econometric model in which all are measured in the per worker form. A dynamic GMM approach is also used that controls the country specific effects.

Shaheen, Waqas, Awan and Aslam (2011) conducted study regarding the empirical evidence of economic growth and the authors used the annual time series data from the period 1973 to 2009. Some variables in their study are treated in real terms i.e. data on real imports of goods and services, real gross domestic product etc. In order to check the stationary of data the ADF (augmented Dicky fuller) test and the PP (Phillips Perron) unit root test were used in the study. The bond test for co-integration under ARDL approach was used in the study to explore the long run relationship between variables. Grant Johnston (2004) conducted study about adult literacy and economic growth and the author suggested the Cautious
approach to expand the adult literacy programs because a good quality study or literacy is just like an investment which currently doesn’t give economic growth but due to this the high economic growth can be achieved in the future. The diminishing results can be achieved by investing in literacy programs. Cross country regressions using literacy scores were also used. Jalil and Ying Ma (2008) conducted study for establishing the long term relation between financial development and economic growth, the bond testing ARDL approach was used in this regard for the case of Pakistan and China. The study also used the deposit liability ratio DLR and for financial development the proxy was used that is credit to private sector.

Hussain, Butt, Hassan and Javed (2010) conducted study on mango extension and the authors used the questionnaire as the methodology. The different agreements were included in the questionnaire and by distributing these into respondents the author came to know the results that how much people are aware from the world trade organization reforms and how much are not familiar with these. Labys and Maizels (1990) conducted study on the effect of commodity price fluctuations and their adjustments on the economic conditions of developed countries. The authors used the method of Granger-causality and showed different results regarding different variables. The data of different countries has been used from 1973-1980. Commodity price fluctuations and its impacts in developed countries are explained through different hypothesis in this research i.e. direct price, indirect price and kaldor-effect hypothesis.

The Impact of commodity market on the economic development in Sub-Saharan Africa conducted at Stellenbosch University by Ocran (2007). The author has considered eighteen commodities in his study which are exported by the most countries in SSA. These commodities have been drawn from metals, raw materials, and food and energy groups. The study used data having a sample of 38 SSA countries and used a panel data framework with period ranging from 1960 to 1999. Dehn (2000) conducted study on commodity price uncertainty and shocks implication for economic growth. The author shows the effect of ex post shocks and ex ante price variability on economic growth by using the Burnside and Dollar (1997) data set. The data used over here is of aggregate commodity prices indices of 113 developing countries for a time period covering 1957Q1-1997Q4. Afzal (2009) conducted study on the impact of population growth and economic growth. In his study the author uses the Multivariate analyses of 1981 to 2005 and shows that the population growth and measure of economic advancement have negative relationship.

Abdullah, Habibullah and Baharumshah (2009) conducted study regarding the impact of relationship between fiscal variables and economic growth in Asian countries. The researchers have used the generalized method of moments (GMM) as a dynamic panel data analysis over 1985-2001 periods. This data is having a number of time invariant and time varying variables and time varying variables have been averaged over four year. The data investigates two different channels due to which fiscal policy affects the L.R economic growth in Asia. The first channel is when components and aggregate government expenditure affects the real per capita GDP and the second is when the components and aggregate of other fiscal variables affects the real per capita GDP. The findings showed that dynamic panel data result specially GMM-SYS maintain a L.R positive relationship between fiscal policy and economic growth.

IV. Results and Discussion
The analytical structure of this chapter contains all detail about results of this research, and it also contains complete step by step analysis of GDP and selected commodities. In First step descriptive analysis is performed to find out the temporal properties of data, mean standard deviation kurtosis all are analyzed here. In second step unit root test has been carried out to check data is non stationary or stationary, if data is non stationary then it is checked where it becomes stationary means at which difference level it become stationary. Data are checked here at different levels to analyze at which level it becomes stationary. After this in third step relationship among commodity market and economic growth is analyzed. Here it is checked relationship that is whether independent variable has significant relationship with dependent variable or not ARCH-GARCH test is applied.

Table 1 Descriptive Statistics

<table>
<thead>
<tr>
<th></th>
<th>Y</th>
<th>x1(oil)</th>
<th>x2(gold)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean</td>
<td>786.1528</td>
<td>4158.336</td>
<td>16373.96</td>
</tr>
<tr>
<td>Median</td>
<td>790.1106</td>
<td>3615.560</td>
<td>11584.50</td>
</tr>
<tr>
<td>Maximum</td>
<td>1327.885</td>
<td>9850.460</td>
<td>51204.00</td>
</tr>
<tr>
<td>Minimum</td>
<td>472.7885</td>
<td>1127.200</td>
<td>4935.000</td>
</tr>
<tr>
<td>Std. Dev.</td>
<td>231.5995</td>
<td>2501.895</td>
<td>12232.55</td>
</tr>
<tr>
<td>Skewness</td>
<td>0.241162</td>
<td>0.676966</td>
<td>1.132042</td>
</tr>
<tr>
<td>Kurtosis</td>
<td>2.035886</td>
<td>2.288015</td>
<td>3.160236</td>
</tr>
<tr>
<td>Jarque-Bera</td>
<td>6.391840</td>
<td>12.87030</td>
<td>28.33464</td>
</tr>
<tr>
<td>Probability</td>
<td>0.040929</td>
<td>0.001604</td>
<td>0.000001</td>
</tr>
<tr>
<td>Sum</td>
<td>103772.2</td>
<td>548900.3</td>
<td>2161363.</td>
</tr>
<tr>
<td>Sum Sq. Dev.</td>
<td>7026621.</td>
<td>8.20E+08</td>
<td>1.96E+10</td>
</tr>
<tr>
<td>Observations</td>
<td>132</td>
<td>132</td>
<td>132</td>
</tr>
</tbody>
</table>

Results of descriptive statistics test are presented in table 1 and this table contains the summary of the statistics variables used in this study. Mean is 786.1528 and median is 790.1106 of Y variable that is GDP which show where centre of data is located. The largest value of data is 1327.885 and the smallest value is 472.7885, this largest and smallest data show the range of the data. Skewness of this data is 0.241162 which is > than 0 so its distribution of right, having extreme values at right side, and mean is having concentration of most values at the left side.

Value of kurtosis is 2.035886 which are less than 3 that it don’t have leptokurtic distribution because here is mean is less than median and it is platy kurtic distribution. The value of Jarque-Bera is not more and probability is 0.04 which show data is normally distributed.

Mean of x1 variable is 4158.336 and median is 3615.560 where x1 is crude oil prices of commodity market, which show where centre of data is located. The largest value of data is 9850.460 and the smallest value is 1127.200, this largest and smallest data show the range of the data. Skewness of this data is 0.676966 which is > than 0 so its distribution of right, having extreme values at right side, and mean is having concentration of most values at the left side.

Value of kurtosis is 2.288015 which are less than 3 that it doesn’t have leptokurtic distribution it is platy kurtic distribution. The value of Jarque-Bera is not more and probability is 0.001. Mean of x2 variable is 16373.96 and median is 11584.50 where x2 is Gold prices of commodity market, which show where centre of data is located. The largest value of data is 51204.00 and the smallest value is 4935.000, this largest and smallest data show the range of the data. Skewness of this data is 1.132042 which is > than 0 so its distribution of right, having extreme values at right side, and mean is having concentration of most values at the left side.

Value of kurtosis is 3.160236 which are greater than 3 which show that it does have leptokurtic distribution. The value of Jarque-Bera is 28.33464 and probability is 0.000001 that is negligible which show data is less than significant and which show data is not normally distributed.

Table 2 descriptive statistics of data

<table>
<thead>
<tr>
<th></th>
<th>Y</th>
<th>x3 (Rice)</th>
<th>x4(Tea)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean</td>
<td>786.1528</td>
<td>26632.32</td>
<td>170.5897</td>
</tr>
<tr>
<td>Median</td>
<td>790.1106</td>
<td>18320.42</td>
<td>136.0250</td>
</tr>
</tbody>
</table>

34
Mean of x3 variable is 26632.32 and median is where x3 is Rice prices of commodity market, which show where centre of data is located. The largest value of data is 68436.60 and the smallest value is 9896.970, this largest and smallest data show the range of the data. Skewness of this data is 0.680636 which is > than 0 so its distribution of right, having extreme values at right side, and mean is having concentration of most values at the left side. Value of kurtosis is 1.873496 which are less than 3 which show that it doesn’t have leptokurtic distribution it have platy kurtic distribution. The value of Jarque-Bera is 17.17139 and probability is 0.0001 which show data is less than significant and which show data is not normally distributed.

Mean of x4 variable is 170.5897 and median is 136.0250 where x4 is Rice prices of commodity market, which show where centre of data is located. The largest value of data is 317.0600 and the smallest value is 98.65000, this largest and smallest data show the range of the data. Skewness of this data is 0.896151 which is > than 0 so its distribution of right, having extreme values at right side, and mean is having concentration of most values at the left side. Value of kurtosis is 2.218721 which are less than 3 which show that it doesn’t have leptokurtic distribution it have platy kurtic distribution. The value of Jarque-Bera is 21.02510 and probability is 0.00027 which show data is less than significant value and which show data is not normally distributed.

Table 3 ADF (Augmented Dickey Fuller) Test or unit Root Test

<table>
<thead>
<tr>
<th>Variable</th>
<th>ADF at level</th>
<th>1 percent critical value</th>
<th>5 percent critical value</th>
<th>10 percent critical value</th>
</tr>
</thead>
<tbody>
<tr>
<td>X1 – Oil</td>
<td>-7.096374</td>
<td>-3.481217</td>
<td>-2.883753</td>
<td>-2.578694</td>
</tr>
<tr>
<td>X2 – Gold</td>
<td>-11.51170</td>
<td>-3.481623</td>
<td>-2.883930</td>
<td>-2.578788</td>
</tr>
<tr>
<td>X3 – Rice</td>
<td>-8.202749</td>
<td>-3.481623</td>
<td>-2.883930</td>
<td>-2.578788</td>
</tr>
<tr>
<td>X4 – Tea</td>
<td>-10.00514</td>
<td>-3.481217</td>
<td>-2.883753</td>
<td>-2.578694</td>
</tr>
<tr>
<td>Y – GDP</td>
<td>-12.78401</td>
<td>-3.482035</td>
<td>-2.884109</td>
<td>-2.578884</td>
</tr>
</tbody>
</table>

In this research stationary data is not required, but non-stationary data is necessary. But this test is applied to check data used in this research is stationary or non-stationary, and if it is non stationary where it becomes stationary. Taking different logs or in difference levels data become stationary like Gold, Oil, Rice. Tea data become stationary at 1st difference or taking 1st log except GDP data which become stationary at 2nd difference or taking second log. Data become stationary when all critical ADF values are less negative than ADF calculated value.

ARCH/GARCH Test: 4 Table which show Relationship among Commodity market and Economic growth

<table>
<thead>
<tr>
<th></th>
<th>Coefficient</th>
<th>Std. Error</th>
<th>z-Statistic</th>
<th>Prob.</th>
</tr>
</thead>
<tbody>
<tr>
<td>C</td>
<td>507.9522</td>
<td>19.56160</td>
<td>25.96680</td>
<td>0.0000</td>
</tr>
<tr>
<td>COP</td>
<td>0.040954</td>
<td>0.004207</td>
<td>9.734667</td>
<td>0.0000</td>
</tr>
<tr>
<td>GOLD</td>
<td>0.011613</td>
<td>0.000909</td>
<td>12.76868</td>
<td>0.0000</td>
</tr>
<tr>
<td>RICE</td>
<td>0.003224</td>
<td>0.000600</td>
<td>5.370078</td>
<td>0.0000</td>
</tr>
<tr>
<td>TEA</td>
<td>-1.004077</td>
<td>0.223016</td>
<td>-4.502271</td>
<td>0.0000</td>
</tr>
</tbody>
</table>

Variance Equation

<p>| | | | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>C</td>
<td>2589.911</td>
<td>1103.157</td>
<td>2.347727</td>
<td>0.0189</td>
</tr>
<tr>
<td>RESID(-1)^2</td>
<td>0.773448</td>
<td>0.417686</td>
<td>1.851747</td>
<td>0.0641</td>
</tr>
<tr>
<td>GARCH(-1)</td>
<td>-0.354555</td>
<td>0.209098</td>
<td>-1.764760</td>
<td>0.0776</td>
</tr>
</tbody>
</table>

R-squared      0.924732  Mean dependent var  786.1528
Adjusted R-squared 0.920483  S.D. dependent var  231.5995
S.E. of regression     65.30799  Akaike info criterion  10.92109
Sum squared resid     528876.6  Schwarz criterion  11.09580
Log likelihood       -712.7917  F-statistic  217.6366
Durbin-Watson stat  0.179492  Prob(F-statistic)  0.000000

This test is used to analyze relationship between variables. In this study this test is used to check relationship among commodity market and economic growth. So for this purpose ARCH/GARCH test is applied which show above results. C is dependent variable that is GDP and other Oil, rice, tea, gold are independent variable. Here it is analyzed whether dependent variable have significant relationship with independent variable or not. C is analyzed with every variable separately to check c have positive or negative relationship with that variable or not like in results given above, first c is checked with COP (crude oil prices) z statistic value of GDP is 25.96680 and COP is 9.734667 which show they have positive relationship because COP value is positive probability is 0.000 which also show they have significant relationship. z statistic value of GDP is 25.96680 and Gold is 12.76868 which show they have positive relationship because Gold value is positive probability is 0.000 which also show they have significant relationship. z statistic value of GDP is 25.96680 and Rice is 5.370078 which show they have positive relationship because C value is positive probability is 0.000 which also show they have significant relationship. z statistic value of GDP is 25.96680 and Tea is -4.502271 which show they have negative relationship because Tea value is negative. Probability is 0.000 which shows they have significant relationship. At the end it is analyzed that GDP have significant relationship with Gold, Rice, Crude oil, and tea. Increase in (Gold, Rice, Crude oil ) prices causes increase

in GDP but with increase in Tea prices causes decrease in GDP. R squared show fitness and goodness of model which is 0.924732 and it is > 0.05 which show model is excellently fit to this research.

Several studies conducted earlier in order to check the relationship of commodity market with many other factors as well as the different studies conducted regarding the economic growth. There are many studies those have found the significant relationship. In the study of Economic Growth and Management of Natural Resources in the Case of Pakistan it was found that natural resources have long term relationship with the economic growth (Hye and Siddiqui, 2010) and there is a positive correlation between natural resources and economic growth existence.

The present study is based on the impact of commodity market on the economic growth and the finds that commodity market has impact on economic growth. In case of risk and return of commodity market prices and stock market the asymmetric and seasonal effect is present in commodity market and stock market. But in both markets the result are more dominant only on stock market, it means the seasonal effect is more dominant on stock market rather than on commodity market (Hunjra, Azam, Niazi, Butt, Rehman and Azam, 2011). In case of Stock and Credit Market Expansion and Economic Development in Emerging Markets, Spyrous (2001) founded that in some countries the equity market effects the growth but on the other side it also does not support in some countries. Like in liberalized economies, the equity market has a role to play for growth i.e. in Chile and Mexico. While in the India the equity markets don’t affect the real growth of the economy. The equity and credit market both affect the economic growth in South Korea. The commodity market has a great effect on the economic growth of any country.

The agriculture goods have a significant relation with the growth of the Pakistan (Raza, Ali and Mehboob, 2012). Remittances significantly affect the economic growth (Mundaca, 2008). Financial development also has a relation with economic growth therefore Khan, Qayyum and Sheikh (2005) concluded that in the long run, the financial depth and the real interest rate has a positive relationship with economic growth while in the short run, as the change in investment occurs then the economic growth is positively and significantly affected by this.

V. Conclusions
Results of this study show that dependent variable (GDP) is affected by independent variables, which supported hypothesis of this study that is “there is Volatility & Risk And Return Relationship among Commodity Market and Economic Growth.” Result shows risk and return of commodity market give significant impact on economic growth. Rice, gold, crude oil has positive relationship with GDP but tea has negative relationship with GDP. Probability shows that all variables of commodity market give impact on economic growth but increases in gold, crude oil and rice prices also increase GDP but increase in price of tea cause decrease in GDP. So this study concluded that there are volatility and risk & return relationship among commodity market and economic growth. Future direction is analyzing whether commodity market give impact on banking sector or not here it can be analyzed volatility and risk and return relationship among commodity market and banking sector of Pakistan. Another future direction is analyzing impact of volatility in commodity market on consumer behavior.

Limitations of this study are, it is limited to only four commodities but there are lots of other commodities which give impact on economic growth, secondly this study is only limited to one country that is Pakistan this study can be apply for different countries.

References


