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Assimilation between Bond Market and Stock Market

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Abstract - The research work deals with studying of the relation between shares and bonds and comparative analysis of stock (shares) which are listed on stock market exchange and bonds (Government Securities) which are listed in NSE Government security index, which issued in whole sale debt market. For evaluating the relation between stock and bond market to study the comparative analyses of both markets and also finds out the correlation and cointegration between both markets, whether these markets correct each other or not. The objective of this paper is to scrutinize the correlation and linkage structure of stock and bond return across different time-phase horizon between stock and Bond Market Indices over a period from January 2005 to Dec 2010. The findings outbuilding some light on the presence of mean deteriorating arrangement of correlation across changed economic environments. During the economic richness, there is an indication of positive and significant correlation between bond and stock returns.

Keyword : *Bond Index, Stock Index.*

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Assimilation Between Bond Market and Stock Market

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I. Introduction

To analyses the co-movement between stock index and bond index varies with the uncertainty of stock market. They use to protect the volatility from equity index options to provide an objective, observable, and dynamic measure to analyses the stock market uncertainty. Here research examines the stock and bond returns tend to move together during periods of lower stock market uncertainty in different era of tenure. Stock and bond returns tend to exhibit which type of relation either positive or even a negative relation during periods of solid economic and pathetic economy i.e. in crises. The authors' findings have implications for understanding joint cross-market price formation. Diversification beneficial decreases the risk of portfolios which comprises of combination of different investment product that mainly includes stocks and bonds. As an investment, stock market typically is viewed as a financial asset that will fluctuate and influence through political, social, or economic distress and company's performance and investors invest in different sectors and bonds to diversify the risk of losses. Comparative analysis of stock (shares) which are listed on stock market exchange and bonds which are listed in bond index, which issued in bond market. For evaluating the relation between stock and bond market to study the comparative analyses of both markets in different economic time horizons and the correlation between both markets that whether these markets correct each other or not. Is there any integration and adoption between stock market and bond market?

Several studies tells about stock market behaviors which are too specific and the market behaves like a completely random walk which cannot be completely predictable with "full knowledge" theories of market where investors knows whole of the information while we may not know whole of it because of these observations we try to extract evidence that may disclose the prejudices and they acts predictably through observe and detect the sequence of past results and try to estimate the probability with approximation to select the number that has the maximum probability of result. The study analyses that whether the stock market uncertainty has some role to understand the comovements in stock market and bond market.

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Macroeconomics analyzes long-run growth as well as the cyclic movements in total output, unemployment and inflation, the money supply and the budget deficit, and international trade and finance. It focused on the movement and trends in the economy as a whole. Economists evaluate the success of an economy's overall performance by how well it attains the

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following objectives: High levels and rapid growth of output and consumption (output is usually measured by the gross domestic product (GDP), which is the total Value of all final goods and services produced in a given year; also, GDP should be close to potential GDP, the maximum sustainable or high-employment level of output). Low unemployment rate and high employment, with an ample supply of good jobs.

In summary rates generally the stock market get boost or lift high in the condition of low interest rate. Correspondingly stock market has a tendency to goes down or slips as the rising of interest rates. It is not to say that this all things take place in perfect co-ordination. Because market takes time for changes in interest rates to work their way over and done with the markets in the manner as defined above. Aimed at an alert investor, though, changes in interest rates suggestion pointers to shift from equity market to the debt investments when interest rates gets rise and vice versa.

II. Literature Review

The objective of this paper is to examine the correlation and linkage structure of stock and bond return across different time-phase horizon and co-integration relationship between stock and Bond Market Indices over a period from January 2005 to Dec 2010. Many studies conducted research on impact of macro-variable with the stocks and bond market. Study of integration of security and debt market is common among developed countries.

a) Study related to bond market and stock market integration and relation:

Campbell and Aminer (1991) uses a log-linear asset pricing framework and a vector autoregressive model near to break down movements in stock and bond returns due to cause and changes in hopes of future stock dividends, short-term real interest rates, inflation , and excess returns on stocks and bonds. With the using of monthly postwar U.S. data, they found that excess stock yields are to be driven mostly by news almost about future excess stock yields, although excess of 10-year bond yields are driven mostly through news about future price rises or inflation. These results support to clarify why postwar excess stock and bond yields have been nearly uncorrelated.

Bodart et al. (1999) found many answer such as what and how does the potential effects of the exchange rate on the bond and stock national equity index return series due to cause of conditional market volatilities and international correlations of the countries and here they also tell that if we find any little evidence find in bond index return or wholesale debt market while strong asymmetries in conditional volatility. Though, both bonds and equities reveal asymmetry in conditional correlation.

Reddy (2003) studied Integrated financial market which is playing very essential and necessary role for many years with many reasons. Integrated markets provide a channel for conveying or means of transmitting important price signals to auditors. Financial market integration is to promote the growth or development of being essential or compulsion condition for a countries financial sector to raise or come forth as an international financial center.

Evidence from Bursa Malaysia Cheng et al (2002) are using Johansen Cointegration test, VECM-X and GARCH model through this he finds the linkage between stock and bond market through studies and observe the existence of long-term relation and volatility. He also finds co-movement of stock and bond indices where he suggests an equilibrium correlation with short-term inaccuracy or error correction and as of volatility linkage bond market cannot provide a meaningful or significant explanation for conditional and uncertain volatility in stock market, thus, he is rejecting the mixture of distribution hypothesis and premises. Their finding or results sheds that in the course of the economic prosperity or wealth, there is an indication or evidence of positive, progressive, irrelevant and insignificant correlation between bond and stock returns. A significant positive correlation was also observed in the course of the crisis and disaster period. Though, in the course of the recovery period, negative, irrelevant and insignificant relation was saw or observed.

Chen et al (2009) analyses in situation of high volatility state of the bond market and low volatility state of the stock market, the assessment or estimates of bond-stock correlation in both or in cooperation of high and low connection or correlations states are non-negative. But when both bond and stock markets are in high volatility state, the bond-stock correlation has the maximum correlation predicted and estimate at its high correlation-state and almost lowermost correlation estimate at its low correlation-state.

Fight the Fed Model is very popular model to measure the US market fair value. Where this Fight Model compares the earnings yield (E/P) of stock market's with the long-term government bonds yield. When we compare it with traditional methods, it assesses the stock market only by its own without concern to the level of interest rates. The reason most behind habitually refer to in provision of the Fed Model is that cost will more and stocks should yield less when bond earnings are low, such as bonds and stocks are rival asset. Long term real stock return less when beginning P/E is more, and long term returns are more when beginning P/E is less, irrespective of nominal interest rate.

Clifford S. Asness (2000) suggested that long run difference in instability or volatility among stocks and bond are causal and driven of the difference between stocks yields and bond yields. He tries to explain the

presently low stock market dividend and earnings yields. Stock and bond yield are strongly positive correlated and significant due to influence of altering or changing in volatility.

R. P. Berman (2005) studies the European capital markets with European money union (EMU) whether EMU directly or indirectly affect the European capital market. A portfolio should be well diversified and their assets should be well classified so this all things depend on the correct understanding and correlation between bond yield and equity yield across the European country. They emphasis on correlations between both stock and bond markets in the period 1980-2003 among the dominant trends of conditional cross-country. This assessment produces strong evidence of inordinate comovement diagonally the board for both stock markets and government bond markets. Dates of change and speeds of adjustment illustrate a discrepancy widely across the linkage of country. Stock market integration is an additional steady process than bond market integration. The impact of European monetary union (EMU) is rather limited, as it has mainly affected the timing of bond market correlation advantages (but hardly their size) and has had slight apparent consequence on stock market integration.

Sunday Brownson et al are used the some macroeconomic variables like inflation, external debt, domestic savings, nominal exchange rate value of total import, external reserves, industrial capacity utilization and liberalization and see their subjective effect and impact on the government stock, industrial/equities stock and total stock transaction in the Nigerian stock exchange market. He also discloses that inflation; nominal exchange rate of value of total import, domestic savings and liberalization period these all are significant macroeconomic variables which disturbing the value of industrial or equities trading in the stock exchange market of Nigeria. Also, external debt, nominal exchange rate, external reserves, and industrial capacity utilization rate are significant macroeconomic variables that affect the value of government stock transaction in the stock market.

Fama and French et al identifies elements which affect the returns on stocks and bonds; these are five common risk factors which are common factors for the returns on stocks and bonds. There are three factors which are related to stock-market factors as: an overall market factor, factors related to firm size and book-to-market equity. There are two factors which are related to bond-market factors as, related to maturity and default risks. Stock returns have mutual or shared variation due to the stock-market variables, and they are interrelated to bond returns through shared or mutual variation in the bond-market factors. Excluding low-grade corporates, the bond-market factors arrest the shared or common variation in bond yields or returns. The Most essential thing is that these five factors seem like to clarify the average returns on stocks and bond market.

Kenneth L. Smith studies show that world equity markets are gradually and increasingly connected and correlated; people take much interest in equity market. Correlation specifies that the co-movements between government bond markets are decreasing; leading to the decision is that investor's is getting beneficiation from international diversification. Equity markets show that major world equity markets share common factors that drive these markets. Their Outcomes described at this time approve that it is also happen in the situation for government bond markets where it is demonstrating that international diversification potential is lesser and that this information can be used to better forecast government bond market movements than if markets are not cointegrated.

Lingfeng li (Nov 2002) examines the correlation between stock and bond returns. He studied first G7 countries where he finds major trends in stock-bond correlation, which is, follow a similar reverting pattern in the past forty years. Next, he uses an asset-pricing model to show that the correlation of stock and bond yields can be explained with collective disclosure to macroeconomic variables. By using three successively more realistic interpretations of asset return dynamics he is examined relation amongst the stock-bond correlation and macroeconomic variables. Their Observed outcomes show that the major trends in stock-bond correlation are resulted mainly by improbability about estimated inflation. The real interest rate and Un-estimated inflation are significant to some extent. Through using these macroeconomic variables he forecast the stock-bond correlation, which is also, helps to recover investors' asset allocation choices. He also finds link between trends in stock-bond correlation and inflation risk.

b) Study related to effects of macro variables on bond market :

Kaiserstrasse (2001) found that a high degree of correlation take place among the long-term government bond return and the short-term Treasury Bills rate which lay down or tell us that there is significance or relation of the interest rates term structure in capital markets. Due to Integration and cause-effect and relation of the foreign exchange market with the money market and the government securities markets has helped them in liquidity management by the Reserve Bank. However, the equity market has relatively low correlation with other market segments. There is evidence of India's growing international integration through trade and cross border capital flows. India's trade and financial links with Asia are also growing among recent initiatives taken to promote regional cooperation. Emerging Asia has become the 'Growth Centre' of the world due to shifting of

production base to the region. Which is likely to stimulate great?

Barr and Priestley (2003) has faith that the benefits of international bond market integration and economic costs are likely to be correlated and significant which is mainly leading to a extra or over cost of fiscal funding for government.

Suk- Jong Km et al (2004) in EU Countries: this paper examines the time-varying level of integration of European government bond markets. We provide evidence for strong contemporaneous and dynamic linkages between existing EU member bond markets with that of 15 Germany. Our results have an important policy implication in that the government bond market convergence requires more than monetary and fiscal policy coordination. That is, bond market convergence requires policies designed specifically to address issues unique to this segment of the financial market.

Mohan (2005) promoting investment, domestic saving and outcome of economic growth these all variables are important vehicles for efficient and financial markets.

Journal of Monetary Economics by Fama, (1990) examines the ability to forecast one-year spot interest rates in the context of forecasting its components: the one-year inflation rate, and the real return on one-year bonds. It is found that the expected values of those two components move opposite to one another. Fama also finds that forecasts of these variables are related to the business cycle.

Xuan Vinh VO investigates the degree of international financial integration in Asia by examining the relationships amongst Asian bond markets by employing the advanced econometric technique of cointegration of error correction vectors. This study has a strong implication for investors paper analysis provides strong implication for international investors and fund managers in relation to international diversification whether they do benefit from investing in Asian bond markets.

c) Study related to effects of macro variables on stock market:

Shahid Ahmed finds out the relationship and effects macro variables on stock prices. This study investigates the environment of the causative relationships among stock prices and the key macro-economic factors demonstrating real and financial sector of the Indian economy. He took the quarterly data from 1995 to 2007. The study tells that the movement and fluctuation of stock prices occurs which is not only the result of behavior and performance of basic macro-economic factors but it is also one of the reasons of movement and fluctuation in other macro measurement in the economy.

Malcolm Baker and Jeffrey Wurgler studied and measure the investor sentiments and its effect on the firms and stock market. And also studies that effect on stock market by speculator when they attract particular stock and get the limited arbitrage opportunity. Sentiments also affect the cost of capitals. So it may have consequences for the corporate firms for allocation of investment capital between safer and more speculative firms.

Jangkoo Kanga et al paper contributes to the evidence on the linkage between financial markets and the macroeconomic. We construct a conditioning variable from a set of macroeconomic variables and address one of the most compelling issues in finance, the time and cross-sectional variations in risk premium based on the suggested variable. We demonstrate that our proposed measure contains important information for predicting future stock returns and explaining the cross-section of average equity returns.

Oliver Bogutha et al identify a novel source of alpha bias that may occur any time uses a conditional risk proxy not entirely contained in the investor information set. This potential empirical problem is the complement of under conditioning, and over conditioning. While the concept is general, we focus on the over conditioning bias generated by using contemporary realized beta as a proxy for conditional beta. All empirical realized betas contain some degree of estimation error, and thus cannot be fully anticipated by investors.

Ologunde et al (2006) examined the relationships between stock market capitalization rate and interest rate in Nigeria. They used the ordinary least-square (OLS) regression method and they found that the prevailing interest rate exerts positive influence on stock market capitalization rate. Also, they are finding that Government development stock rate exerts negative influence on stock market capitalization rate and prevailing interest rate exerts negative influence on government development stock rate. He also studied the volatility behavior of Nigerian insurance stock price. They evaluate the risk volatile and information measures of insurance stock. They are relevant to the investing community as a whole who invest their hard-earned money on corporate insurance business expecting reasonable return.

Kurihara (2006) suggests that stock market capitalization rate is significantly influenced by the macroeconomic environment factors such as gross domestic product, exchange rates, interest rates, current account and money supply.

Evidence from Jordan examines the effect of interest rates on the stock market capitalization rate in Stock Exchange. This study suggests the importance of government intervention to encourage investment in ASE by reducing rate of personal taxation thus, granting incentive for creation of wealth, controlling interest rate so as to aid the growth of the stock market and improving the regulatory environment and decreasing

red tape because there is significant and positive relationship between government prevailing interest rate and stock market capitalization rate.

Litterman et al (1991) publish Journal of Fixed Income Use principal components analysis to determine the important factors that affect term structure movements.

Vipul Bhatt et al (2005) studied Interest Rate Parity in India: The paper shows that the short-term (up to 3 month) money markets in India are getting progressively integrated with those in the USA even though the degree of integration is far from perfect. Analysis of RBI interventions in response to foreign exchange shocks suggests that these may play a role in the deviations from interest parity.

Wan Mansor et al (2009) deals with four economic factor such as inflation rate, industrial production output, stock prices and foreign exchange rates and also finds there has linkage and dynamic relationship between stock prices and these economic variables in six Asian- Pacific selected countries like Malaysia, Korea, Thailand, Hong Kong, Japan and Australia. He used monthly data for 10 years from January1993 to December 2002. His results explain the long run equilibrium relationship exiting between variables only in four countries like Japan, Korea, Hong Kong and Australia, and short run relationship between all countries except Hong Kong and Thailand they shows some interaction.

Fama (1981) explains that there is negative relationship between stock returns and inflation through a hypothesized chain based on the quantity theory of money and the money.

Ajayi and Mougoue (1996) tells that there is a long-run relationship and significant relationship between stock market and exchange market where we finds have a positive effect exit on domestic currency with increase in stock prices.

Yu (1996) results studied relation between stock market and Tokyo and Hong Kong markets and Singapore market based on the Granger causality test, he explain in his study that the changes we have seen stock prices are affected because of changes in exchange rates in Tokyo and Hong Kong markets. However, no any such causativeness was seen for the Singapore market.

Shih-Jen Lia and Jin Ting Che (2005) focused on the relationship among oil prices, gold prices, and individual Industrial Sub-Indices instead of the popular Taiwan Stock Exchange Capitalization Weighted Stock Index (TAIEX). The authors believe that commodity prices should have different degrees of influences to individual industries instead of the whole market. According to previous research, stock returns have leptokurtic, volatility clustering, and volatility asymmetric characteristics; this research further applies the TGARCH models to describe the relationship among oil prices, gold prices, and individual Industrial Sub-Indices.

Wen-Rong et al (2010) established the understanding of the interactive relationship among the Amex gold BUGS index, the New York gold spot and the New York gold futures in the gold market, as well as the Commodity Research Bureau (CRB) futures price index, the Dow Jones industrial average, the OPEC crude oil spot, and the dollar index. To do so, the study adopted the Vector Error Correction Model (VECM), the Granger causality test, the state space model and several other time series research methods. The research results indicate that co-integration exists among gold futures, gold indices and the overall economy, meaning there is a long-term equilibrium relationship with gold futures.

Cuneyt Aka (2011) investigated the relationships between the stock exchange, gold, and foreign exchange returns in Turkey. The monthly data of the Istanbul Stock Exchange (ISE), foreign exchange and gold prices for the period 1990-2010, are used for the analysis by means of the dynamic conditional correlations GARCH (DCC-GARCH) model. The results show that the conditional correlations between investments are time varying, and the 2001 crisis was a significant turning point in the dynamic relationships between various investment.

Suhana binti Mohamed Alizah binti Ali et al studied a stock market indices movement explains the overall market sentiment and Investors use these to estimate the forthcoming market trend. The aims of this research are to observe the kith and kinship between the consumer product and industrial product index with macroeconomic factors like Inflation rate (consumer price index), interest rate (base lending rate) and Money supply (M2). He studies the Malaysia economy, where the consumer product and industrial product sector play a significant role in driving the development of the Malaysia; whether as a strategic sector or as a mobiliser of funds for investment. They have taken 15 years' time period for sample data collection, which was calculated with the help of SPSS and their results, show that there has significance correlation between all variables and the indices. Whilst BLR and CPI have negative relationship with consumer product and industrial product index in Bursa Malaysia. Results also show that M2 has a positive relationship with consumer product and industrial product index in Bursa Malaysia it means that all variables and factors have significant correlation with the stock market indices.

Doong et al (2005) studied the six Asian countries (Malaysia, Indonesia, South Korea, Thailand, Philippines and Taiwan) over in the era of 1989-2003 to analyses and finds that dynamic relationship among stocks and exchange rates. According to their work, these financial factors are not cointegrated. He used Granger causality test which shows that in Malaysia, Indonesia, Thailand, and Korea bidirectional causality

can be identified and also, there has found significantly negative relation among the contemporary variation in the exchange rates and the stock returns for all countries excluding Thailand.

This research work deals with studying the relation between shares and bonds and comparative analysis of stock (shares) which are listed on stock market exchange and bonds, which issued in bond market. Is there any integration and adoption between stock market and bond market? How closely the equity return and bond return are related with each other in India.

III. Objective

To find out the correlation or bonding among stock market and bond market, whether one markets corrects another or not and study the comparative analysis of bond index return and stock index return in different economic time horizons, either they move together or not and their impact on index. Study the closeness between the equity return and bond return are related with each other in India.

a) Rationale of Study

Rationale of Study to analyzes the relationship between Indian Bond Market and Stock Market. As an investment, stock market typically is viewed as a financial asset that will fluctuate and influence through political, social, or economic distress and company's performance and investors invest in bond market to diversify the risk of losses. There are several studies tells about stock market behaviors which are too specific and the market behaves like a completely random walk which cannot be completely predictable with "full knowledge" theories of market where investors knows whole of the information while we may not know whole of it because of these observations he try to extract evidence that may disclose the prejudices and they acts predictably through observe and detect the sequence of past results and try to estimate the probability with approximation to select the number that has the maximum probability of result. The study analyses that whether the stock market uncertainty has some role to understand the comovements in stock market and bond market in comparative time horizons.

The research work deals with studying of the relation between shares and bonds and comparative analysis of stock (shares) which are listed on stock market exchange and bonds which are listed in bond index, which issued in bond market. For evaluating the relation between stock and bond market to study the comparative analyses of both markets in different economic time horizons and also finds out the correlation between both markets. This study also analyzes that, whether these markets correct each other or not. How closely the equity return and bond return are related with each other in India. The price of Indian government bonds tends to increase, relative to stocks or not. To compares the trends and prize fluctuation in stock market and bond market. The utility of this research is to know the relationship of Indian stock market and Indian bond market and to find how much the Stock Market linked with the bond market of India. Thus paper analyze that there is any impact of stock market on bond market of India and vice a versa. How much theirs comovement follow each other or not. If there are any relation exists, then it is positive relation or negative relation. Here I took dependent variable is stock market of India and the independent variable are government securities index return, treasury bill index return, below 3 year maturity period bond index return, between 3 and 8 year maturity period index return, above 8 year maturity period bond index return and whole government NSE bond index return in correlation and regression.

The element of the Stock Market is the Index of stock market 'S & P CNX Nifty index' and the element of the Indian Bond Market is the Index of Indian bond market 'NSE Bond index'. We take the secondary data of the stock index return; treasury bills index return, government security index return, different maturity period of bond index return and overall bond index return. The Stock Market is the dependent variable and treasury bills index return, government security index return, different maturity period of bond index return and overall bond index return of India are the dependent variable.

IV. Research Methodology

Secondary Data is used in this research, because we used the historical data. The sources of the Indian stock Market data is 'S & P CNX Nifty index' and the source of the Indian Government Security Market is the Index of Indian bond market 'NSE Bond index 'of NSE web sites. The data is unobtrusive data because the sources of the data are the historical data. So we get the real data. The technique is used for data collection in the research is observational studies, because we use the secondary data for the research.

The Data of Indian Stock Market is collected from http:// www.nseindia.com, the data of Bond Market is collected from http://www.debtonnet.com, http:// www.nse_bondindex.com and http://www.rbi.org.in etc.

a) Data sources

The indices provided are: Composite (overall NSE govt. index), TB index, GS index and Data for S&P CNX NIFTY for the period 01-01-2006 to 31-12-2010.

1) Total returns index of Government securities for India- Jan 2006 to Dec 2010- Source: NSE.
2) Total returns index of T-Bills for India- Jan 2006 to Dec 2010- Source: NSE
3) Total returns index of products all NSE govt. index for India- Jan 2006 to Dec 2010- Source: NSE

4) Total returns index of S&P CNX NIFTY for India- Jan 2006 to Dec 2010- Source: NSE

This Research paper takes monthly data of the Indian Stock Market Index from 'S & P CNX Nifty index' as stock index return and Indian Government Security Index from 'NSE Bond index as treasury bills index return, government security index return, and overall bond index return from 1st of Jan 2006 to 31st of December 2010.

NIFTY is taken as representing Index of Indian Stock Market and NSE Bond Index is taken as representing Index of Debt Market. The sample size for this research is the data of Stock Market Index return and Government Security index return of India on monthly basis for 5 year that is the Jan 2006 to December 2010. The research consist the monthly data of variables because it helps to make it more manageable.

In Research first of all finds the skewness and kurtosis of the Data, through it we can find that our data is normally distributed or not. If the skewness and Kurtosis of the data is between -1 to +1, it represent that our data is normal distributed. Then we apply the parametric test on the data and will find correlation between Stock Market Index return and Indian Bond Market index return of India. For Data analysis the research uses SPSS software for regression and correlation.

b) Tools for Data analysis

Various statistical tools can be applied to study the relation of Indian stock Market and bond market. In this study, Data is analyzed using tools like Correlation, Regression, T-test and Durbin Watson test and software used for the analysis is SPSS. Monthly Data of 'S & P CNX Nifty index' as stock index return and 'NSE Government Security Index' of India as treasury bills index return, government security index return, different maturity period of bond index return and overall bond index return is taken for this study from 1st of Jan 2006 to 31st of December 2010. Correlation is applied to find the relation between stock market and bond market, and find the coefficient (r) between these two.

To study and analyses the impact of bond market on stock market of India. NSE Government security index return is taken as independent variable and S&P CNX NIFTY index return taken as the dependent variable. Regression Model is applied to find the impact of bond market on stock market of India. Following Regression equation is used to find the impact.

$$\Delta Ni = a_0 + a_1 \Delta Bi + e$$

Where,

a- represents the coefficients

ΔNi - refers to change in monthly index return of NSE securities of India

ΔBi - refers to change in monthly movement of index return of NSE Government securities index of India.

e- Represents the error term

c) Hypothesis

The research begins with the assumption that the null hypothesis (H_0) is true. The goal is to determine whether there is enough evidence to infer that the alternative hypothesis (H_1) is true.

There are two possible decisions:

Conclude that there is enough evidence to support the alternative hypothesis. Conclude that there is not enough evidence to support the alternative hypothesis. So hypothesis of the research are:

H_0 : No bonding effect on return configuration among Stock Market and Bond Market of India in Pre-recession Period.

H_1 : Bonding effect on return configuration between Stock Market and Bond Market of India in Pre-recession Period.

H_0 : No bonding effect on return configuration among Stock Market and Bond Market of India in Recession Period.

H_1 : Bonding effect on return configuration among Stock Market and Bond Market of India in Recession Period

H_0 : No bonding effect on return configuration among Stock Market and Bond Market of India in Post-recession Period.

H_1 : Bonding effect on return configuration among Stock Market and Bond Market of India in Post-recession Period.

V. Data Analysis

Tables Presents the result of the correlation and regression of stock and Government bond index returns during the period of January 2006 – December 2006. The period of analyses is divided into three sub-periods, the first Pre-recession period starts from Jan 2006-Dec2007, and the second Recession period is Jan 2008-Dec 2008, and lastly third Post-recession start from January 2009-Dec 2010.

Regression of Stock Market and Bond Market in India
Pre-recession Period: Jan 2006- Dec 2007

Correlations

		ΔNi	ΔBi
Pearson Correlation	ΔNi	1.000	.479
	ΔBi	.479	1.000
Sig. (1-tailed)	ΔNi	.	.009
	ΔBi	.009	.
N	ΔNi	24	24
	ΔBi	24	24

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	.479	.230	.195	1.97545	1.159

a. Predictors: (Constant), ΔBi
b. Dependent Variable: ΔNi

Coefficients

Model		Unstandardized Coefficients		Standardized Coefficients	T	Sig.
		B	Std. Error	Beta		
1	(Constant)	.108	.462		.233	.818
	ΔBi	.003	.001	.479	2.561	.018

a. Dependent Variable: ΔNi

Data has been taken for this pre-recession period from Jan 2006 to December 2007. From the output table it is observed that there is a positive correlation between government bond market and stock market. The correlation between these two comes out to be 47.9%, which means these two have weak correlation, because the value of the Pearson correlation is 0.479 that is lower than 0.5, that government bond market and stock market are 47.9% correlated in Pre-Recession Period. It means there is weak correlation between Stock market and Bond market.

Regression Model for Pre- Recession Period

$\Delta Ni = 0.108 + 0.462\Delta Bi + e$

The value of R-square is 0.23 and the t-value of is 2.561 at 0.018 as level of significance. It has suggested that the independent variable reveals 23.0% of the reason for change in dependent variable due to independent variable. Level of significance is at 0.018, so it can be concluded stock market has impact on bond market.

Beta value of change in security index return i.e. ΔNi is positive; this shows that stock market has positive impact on bond market. Both these markets are in-depended market and they both are influenced by their individual existence i.e. depended and correct on each other by some.

Recession Period: Jan 2008 - Dec 2008

Correlations

		ΔNi	ΔBi
Pearson Correlation	ΔNi	1.000	.243
	ΔBi	.243	1.000
Sig. (1-tailed)	ΔNi	.	.224
	ΔBi	.224	.
N	ΔNi	12	12
	ΔBi	12	12

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	.053[a]	.003	-.043	3.35125	1.994

a. Predictors: (Constant), ΔBi
b. Dependent Variable: ΔNi

Coefficients

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	.137	.791		.173	.864
	ΔBi	ΔBi	.002	-.053	-.247	.807

a. Dependent Variable: ΔNi

Data has been taken for this recession period from January 2008 to December 2008. From the output table it is observed that there is a positive correlation between government bond market and stock market. The negative correlation between these two comes out to be 5.3%, which means these two have negative and insignificant correlation.

Regression Model for Pre -Recession Period:

$$\Delta Ni = 0.137 + 0.791\Delta Bi + e$$

The value of R-square is 0.003 and the t-value is -0.247 at 0.807 as level of significance. It has suggested that the independent variable reveals only 0.3% of the reason for change in dependent variable due to independent variable in Post-Recession Period. Beta value of change in security index return i.e. ΔNi is negative; this shows that stock market has negative impact on bond market.

VI. Findings and Discussions

From the output of various tools applied on variables, it is found that:

There is positive correlation between stock market and bond market of India. But this relation is very weak between stock market and government bond market.

Study of correlation and regression presents correlation structure of stock and bond return over the period from Jan 2006 to Dec 2010 both at weekly and monthly observation. Findings show some interesting mean-reverting pattern in the correlation structure of stock and bond indices across different economic setting from small positive to negative correlation. The results confirm that there exists positive and significant correlation between stock and bond return during economic booming (pre- recession period). In contrast, correlation during the Recession period appears to be relatively lower positive recording 0.243 and Insignificant. Lastly correlation structure for Post-recession period appears to be negative and insignificant, recording -–0.053 for monthly return series. As we can see from the findings that there is a clear pattern in correlation structure of stock and bond returns. Positive and stronger correlation for pre-recession period is followed by positive and weaker correlation for during recession and finally reporting negative and insignificant correlation for post-recession period. This outbuilding some significant light about mean-reverting pattern of correlation between stock and bond returns. The exhibition of negative correlation for post-recession period provides vital vision about the careful allocation of fund across stock and bond that may increase portfolio performance.

The value of R- square is 23% higher in economic booming (i.e. pre-recession period) and in contrast value of R-square during recession period appears to be relatively lower recording 5.9%. Lastly the value of R-square for post-recession period appears to be relatively very low recording 0.3% for monthly series of bond return indices and stock return indices. As we seen from the findings that there is clear pattern in value of R-square structure of stocks and bond returns. Stronger impact of stock market on bond market for prerecession period is followed by lower and negligible impact for post-recession period.

VII. Conclusion

The objective of this paper is to scrutinize the correlation and linkage structure of stock and bond return across different time-phase horizon and co-integration relationship between stock and Bond Market Indices over a period from January 2005 to Dec 2010. The findings outbuilding some light on the presence of mean deteriorating arrangement of correlation across changed economic environments. During the economic richness, there is an indication of positive and significant correlation between bond and stock returns. A significant positive correlation was also observed during the recession period. Conversely, in the course of the recovery period, negative and insignificant relation was observed. Conclusions on co-movement of stock and bond index recommend no evenness relationship with any short-term error correction. Results also indicate that the stock and bond markets of are independent of each other, with most of the variations in indices being explained by past value of each respective market Indian capital market, therefore hypothesis of cointegration test has not been rejected therefor, No long term equilibrium exist between stock market and debt market.

VIII. Limitation

The limitation is that the number of observations has taken is low i.e. only 60 that is monthly observation from year Jan 2006 to Dec 2010 in these study which shorter span of time and in data of bond market through which analysis of correlation between bond market and stock market of India. Only NSE Government Securities Index of whole sale debt market has been taken and there has no consideration of bonds of retail debt market and corporate debt market.

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Annexure

Date	Total Returns Index of GS index	Total Returns Index of T-bills index	Total Returns Index of 1-3 yrs. maturity bond index	Total Returns Index of 3-8 yrs. maturity bond index	All Products of NSE Govt. index	change in all products of NSE bond index	Historical Data for S&P CNX NIFTY period 01-01-2006 to 30-11-2011	change in S n P CNX Nifty index
1-Dec-05	245.46	205.51	197.21	240.48	241.44		3271.45	
1-Jan-06	246.38	210.73	197.74	241.04	242.35	0.9	3420.60	149.15
1-Feb-06	244.66	207.17	197.35	238.29	240.83	-1.51	3573.20	152.61
1-Mar-06	244.18	208.04	197.81	238.25	240.48	-0.36	3831.14	257.94
1-Apr-06	244.38	209.78	199.99	240.87	240.79	0.32	4106.94	275.79
1-May06	242.77	210.73	200.89	240.64	239.38	-1.42	4094.11	-12.83
1-Jun-06	238.6	211.39	200.51	238.89	235.62	-3.76	3450.48	-643.63
1-Jul-06	235.28	212.74	200.41	235.05	232.72	-2.9	3684.34	233.86
1-Aug-06	238.05	213.86	201.74	236.87	235.35	2.64	3942.45	258.11
1-Sep-06	242.88	214.97	204.39	239.8	239.98	4.63	4172.65	230.20
1-Oct-06	245.35	215.92	202.34	240.44	242.2	2.22	4362.38	189.73
1-Nov-06	250.13	217.59	204.34	243.13	246.66	4.46	4626.26	263.88
1-Dec-06	250.98	218.33	204.42	243.46	247.5	0.85	4680.27	54.00
1-Jan-07	250.36	219.72	206	244.89	247.09	-0.42	4843.87	163.60
1-Feb-07	248.26	220.78	205.43	229.35	245.3	-1.79	4930.35	86.49
1-Mar-07	245.38	222.7	206.31	241.71	244.02	-1.27	4491.18	-439.17
1-Apr-07	246.87	223.45	206.8	242.13	244.32	0.3	4760.05	268.87
1-May07	247.71	224.83	207.69	243.03	245.22	0.9	5051.22	291.17
1-Jun-07	248.93	226.45	210.13	244.92	246.48	1.25	5103.70	52.48
1-Jul-07	254.22	228.31	213.7	250.32	251.38	4.9	5422.80	319.10
1-Aug-07	254.88	229.32	212.51	250.44	252.1	0.73	5211.95	-210.85
1-Sep-07	256.05	230.69	214.3	251.28	253.33	1.23	5653.88	441.92
1-Oct-07	257.44	232.09	214.87	254	254.73	1.4	6623.03	969.15
1-Nov-07	258.51	233.32	215.23	253.71	255.86	1.13	6979.90	356.87
1-Dec-07	260.62	234.77	216.5	254.64	257.9	2.04	7243.10	263.20
1-Jan-08	268.11	236.62	219.88	260.98	264.84	6.94	6997.18	-245.92
1-Feb-08	269.37	237.9	220.46	261.93	266.13	1.3	6329.39	-667.79
1-Mar-08	254.43	227.14	209.88	248.93	251.6	-14.53	5804.92	-524.46
1-Apr-08	263.41	240.5	221.73	259.7	260.93	9.33	5967.00	162.08
1-May08	265.45	241.77	222.32	260.56	262.91	1.98	6125.13	158.13
1-Jun-08	260.6	242.7	221.74	257.11	258.63	-4.28	5443.44	-681.69
1-Jul-08	249.84	244.25	219.6	248.71	249.05	-9.58	5037.39	-406.05
1-Aug-08	252.1	246.1	220.96	251.62	251.29	2.24	5403.50	366.11
1-Sep-08	262.88	248.19	224.72	258.76	261.26	9.97	5155.47	-248.03
1-Oct-08	272.89	250.45	229.43	266.92	270.58	9.32	3971.71	-1183.7
1-Nov-08	280.73	252.45	233.46	274.36	277.94	7.36	3477.28	-494.44

1-Dec-08	302.33	254.73	238.61	289.49	297.77	19.83	3553.82	76.55
1-Jan-09	313.31	256.73	243.49	297.42	305.13	7.36	3507.78	-46.04
1-Feb-09	303.75	257.77	242.89	293.92	299.26	-5.87	3471.02	-36.76
1-Mar-09	297.08	258.64	242.13	288.13	293.29	-5.98	3451.00	-20.02
1-Apr-09	301.13	260.24	244.97	291.51	297.08	3.79	4137.90	686.89
1-May09	303.45	261.21	244.79	293.24	299.25	2.16	4875.10	737.20
1-Jun-09	300.7	262.04	243.45	291.14	296.72	-2.52	5471.42	596.33
1-Jul-09	300.07	263.27	244.66	291.45	296.2	-0.52	5369.89	-101.53
1-Aug-09	296.17	264.14	243.29	287.2	292.72	-3.49	5659.29	289.40
1-Sep-09	295.09	264.74	242.81	287.57	291.77	-0.94	6022.16	362.86
1-Oct-09	295.88	265.87	244.04	288.87	292.59	0.81	6193.72	171.57
1-Nov-09	298.9	267.01	247.01	291.93	295.46	2.87	6147.06	-46.66
1-Dec-09	297.52	267.81	246.7	290.68	294.24	-1.21	6329.41	182.35
1-Jan-10	296.4	269.29	246.54	289.3	293.31	-0.94	6401.53	72.12
1-Feb-10	296.44	269.91	247.6	290.48	293.37	0.07	6010.85	-390.69
1-Mar-10	296.57	271.04	249.93	290.81	293.43	0.06	6432.60	421.75
1-Apr-10	297.88	272.13	251.03	291.84	294.87	1.44	6579.90	147.30
1-May10	305.61	272.96	252.66	298.04	302.08	7.21	6284.77	-295.14
1-Jun-10	302.5	273.11	252.97	302.63	299.17	-2.91	6471.67	186.90
1-Jul-10	300.95	273.65	251.77	302.47	297.81	-1.36	6699.86	228.19
1-Aug-10	299.34	274.48	250.11	300.52	296.38	-1.43	6827.73	127.87
1-Sep-10	298.92	275.91	251.1	301.52	296.15	-0.23	7279.92	452.19
1-Oct-10	299.97	277.42	251.46	300.56	298.79	2.64	7640.11	360.19
1-Nov-10	301.76	278.85	252.71	302.78	298.79	0	7594.98	-45.13
1-Dec-10	301.41	280.18	252.9	302.9	298.71	-0.08	7491.35	-103.63