AN INTEGRATED STUDY OF FINANCIAL MARKETS IN INDIA: AN EMPIRICAL EVIDENCE

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ABSTRACT

The flow of information between financial markets is an issue that has attracted considerable attention in the empirical finance literature. In order to examine interrelation among different types of financial markets i.e. Capital Market, derivative market, Money Market and Foreign Exchange market in short run, the basic data used in the study consist of four variables which are spot equity index rates, 3 month future equity index rates, repo rate ,dollar/rupee exchange rate for the financial year 2014-2015. This paper has made an attempt to study the impact of Equity Spot Market on Forex, Money and Index Futures Market by using a simple regression analysis. The result indicates that the Spot Market has a significant impact on the Futures Market and Future Market is highly dependent on the Spot market. But the result of the regression analysis does not suggest the presence of significantly strong impact of Spot Market on Forex and Money Market. The study has also made an attempt to understand the causal link between Capital Market, Monet Market, Forex and Futures Market using univariate Granger Causality, but did not find any evidence for the existence of causal link between these segments of the Financial Market.

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1. Introduction

Financial Market is a mechanism that allows people to buy and sell (trade) financial securities (such as stocks and bonds), commodities (such as precious metals or agricultural goods), and other fungible items of value at low transaction costs and at prices that reflect the efficient-market hypothesis. . Financial Markets are typically defined by having transparent pricing, basic regulations on trading, costs and fees and market forces determining the prices of securities that trade. In economics, typically, the term market means the aggregate of possible buyers and sellers of a certain good or service and the transactions between them. The term "market" is sometimes used for what are more strictly exchanges, organizations that facilitate the trade in financial securities, e.g., a stock exchange or exchange in Finance, Financial Markets facilitate:

- The raising of capital (in the Capital Markets)

- The transfer of risk (in the Derivatives Markets)

- The transfer of liquidity (in the Money Markets)

- And are used to match those who want capital to those who have it

Historical Evolution of Financial Markets

The financial system and infrastructure of a country, at a given point in time, is the result of its own peculiar historical evolution. This evolution is shaped by the continuous interaction between all the players in the system and public policy interventions over time. These policy interventions are also a reflection of the thinking of regulators and governments of the time as to the acceptable and desirable balance between innovation and stability, and between the role of state and the markets.

The evolution of Indian financial markets and the regulatory system has also followed a similar path. For instance, India began with the central bank, Reserve Bank of India (RBI), as the banking sector regulator, and the Ministry of Finance as the regulator for

all other financial sectors. Today, most financial service providers and their regulatory agencies are now in place. The role of regulators has evolved over time from that of an instrument for planned development in the initial stage to that of a referee of a relatively more modern and complex financial sector at present.

Over this period, a variety of financial sector reform measures have been undertaken in India, with many important successes. An important feature of these reforms has been the attempt of the authorities to align the regulatory framework with international best practices, keeping in view the needs of the country and domestic factors. These reforms can be broadly classified as steps taken towards:

i. Liberalizing the overall macroeconomic and regulatory environment within which financial sector institutions function,

ii. Strengthening the institutions and improving their efficiency and competitiveness, and

iii. Establishing and strengthening the regulatory framework and institutions for overseeing the financial system.

TYPES OF FINANCIAL MARKET

Money Market: It is the sector of the financial market that includes financial instruments that have a maturity or redemption date that is one year or less at the time of issuance. These are mainly wholesale markets. Money Market refer to the network of financial institutions dealing in short term funds through instruments like bills of exchanges, promissory notes, commercial paper, treasury bills etc.

The purpose of Money Markets is facilitate the transfer of short-term funds from agents with excess funds (corporations, financial institutions, individuals, government) to those market participants who lack funds for short-term needs. They play central role in the country's financial system, by influencing it through the country's monetary authority. For financial institutions and to some extent to other non-financial companies Money Markets allow for executing such functions as:

. Fund raising;

. Cash management;

. Risk management;

. Speculation or position financing;

. Signaling;

. It provides access to information on prices.

Money Markets are wholesale markets with very large amounts of transactions, e.g. with transactions from 500 million Euro to 1 billion Euro or even larger ones. This is the most active financial market in terms of volumes of trading. From the start of emergence the traditional Money Markets performed the role of monetary policy.

 In order to influence the supply side, governments have employed methods of direct regulation and control of the savings and investment behavior of individuals and companies. However due to fast technological advances, internationalization and liberalization of financial markets, possibilities to carry out policy objectives through such measures have diminished. Current policy through market oriented measures is aimed primarily at demand side. Thus Money Markets serve the interface between execution of monetary policy and the national economies another role of domestic Money Markets is to serve public policy objectives, i.e. financing public sector deficits and managing the accumulated government deficits. Government public debt policy is an important determinant of the Money Markets operations, since government debt typically forms a key part of the country's Money Markets (as well as debt markets). The scope and measures of monetary policy are also linked to the government's budget and fiscal policies. Thus the country's Money Market shifts are dependent upon the goals of national public policy and tools used to reach these goals.

Capital Market: The Capital Market is the sector of the financial market where long-term financial instruments issued by corporations and governments trade. Here "long-term" refers to a financial instrument with an original maturity greater than one year and perpetual securities (those with no maturity). There are two types of Capital Market securities: those that represent shares of ownership interest, also called equity, issued by

corporations, and those that represent indebtedness, or debt issued by corporations and by the state and local governments.

Capital Markets can be classified in terms of cash market and derivative markets.

CASH MARKET: The cash market, also referred to as the Spot Market, is the market for the immediate purchase and sale of a financial instrument.

DERIVATIVE MARKET: In derivatives market, some financial instruments are contracts that specify that the contract holder has either the obligation or the choice to buy or sell another something at or by some future date. The "something" that is the subject of the contract is called the underlying (asset). The underlying asset is a stock, a bond, a financial index, an interest rate, a currency, or a commodity. Because the price of such contracts derives their value from the value of the underlying assets, these contracts are called derivative instruments and the market where they are traded is called the derivatives market.

FOREIGN EXCHANGE MARKET: It is a market in which participants buy, sell, exchange and speculate on currencies. It is made up of banks, commercial companies, central banks, investment management firms, hedge funds, retail Forex brokers and investors. It is considered to be the world's largest market.

Since the currency markets are large and liquid, they are believed to be most efficient financial markets. Foreign exchange markets assists international trade and investment by enabling currency conversion. For example, it permits a business in United States to import goods from the European Union member states in Euros even though its income is in United States dollars. It also supports direct speculation and evaluation relative to the value of the currency and carries trade, speculation based on the interest rate differential between two currencies

The Foreign exchange market is unique because of the following characteristics:

1. It`s huge trading volume representing the largest asset class in the world leading to high liquidity.

2. Its geographical dispersion

3. Its continuous operation:24 hours a day except weekends i.e. trading from 22:00 GMT on Sunday (Sydney) until 22:00GMT Friday(new york)

4. The variety of factors that affect the exchange rates

5. The low margin of relative profit compared with other markets of fixed income

6. Use of leverage to enhance the profit and loss margin and with respect to account size ,as such , it has been referred as the market closer to perfect competition, notwithstanding currency intervention

INTERDEPENDENCE BETWEEN DIFFERENT FINANCIAL MARKETS

The flow of information between financial markets is an issue that has attracted considerable attention in the empirical finance literature. Research in this area examines the extent to which a price shock in one market aspects returns and volatilities in other geographically or temporally distinct markets. These studies focus on spillovers across markets within the equity, foreign exchange, and fixed-income segments and often show that information is transmitted across markets within those segments. An analysis of the transmission of information between markets is important for several reasons.

First, the notion of market efficiency dictates that it should not be possible to predict returns or volatility in one market using lagged information generated in another market. To the extent that there are price and volatility spillovers, this could indicate a failure of market efficiency. On the other hand, if news about fundamentals is serially correlated, then the existence of spillovers need not imply a failure of market efficiency.

Second, it is important to understand the manner in which shocks are propagated across markets in order to determine the persistence of these innovations and the magnitudes of their elects over time.

 Third, the study of price and volatility spillovers between markets is useful from a risk management perspective both in terms of understanding how markets are interrelated and in permitting the development of elective strategies for hedging against shocks that are propagated across markets.

A heightened awareness of the nature of volatility transmission across markets is also of importance to economic policy-makers for the following reasons. First, this issue is significant from a financial stability perspective. To the extent that volatility is transmitted across markets, it may be possible for a large shock in one market to have a destabilizing impact on another market. Second, linkages across market scan affect the success with which policies are implemented. For example, if a central bank wishes to change interest rates and at the same time minimize exchange rate volatility, it would be useful to understand how an unanticipated interest rate change could affect the conditional variance of the exchange rate. Finally, if policy-makers could gauge the depth and duration of the impact of any policy initiative in one financial market on other markets, they could develop more effective policies.

LITERATURE REVIEW

Literature contains many empirical studies that examine the links among different financial markets. Linkages between financial markets across geographic boundaries as well as across asset types have been the object of many studies. One of the reasons for such studies being undertaken is the issue of impact of events in one market on another. The importance of such studies has come to the fore in recent years owing to events such as the 1987 stock market crash, the Mexican crisis, the Asian currency crisis, and so on. A variety of techniques have also been used to study these linkages including cross market correlation coefficients, VAR, cointegration, ARCH and GARCH family of models, GMM, etc.

Prakash Apte (2001): studied the relationship between the volatility of the stock market and that of the nominal exchange rate in India using E-GARCH model. The study suggested that the Empirical analysis with one of the major stock market indices supports the hypothesis of such volatility linkages while for the other index there appears to be a spillover from the foreign exchange market to the stock market but not the other way round.

Francis and Hasan (2003) stated that the relationships between equity and currency markets are significant, bi-directional, and pervasive. Andersen and Bollerslev (2003) states that news surprises produce conditional mean jumps and hence high frequency stock , bonds , and exchange rates dynamics are linked to fundamentals.

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Badrinath and Apte (2005) state that there is an existence of asymmetric volatility spillover across the stock, call money and Forex market in India. The result also indicates either the information assimilation was slow or that the spillover were on account of contagion. Kedarnath and Mukherjee (2005) states that though there is a strong contemporaneous and bi-directional relationship among the returns in the spot and Futures Market, the Spot Market has been found to play comparatively stronger leading role in disseminating information available to the market, and therefore said to be more efficient.

Jain & Bhanumurthi (2005): examined the issue of integration of financial markets in India during the post-1991 period by using monthly data on call money rates, 91 day Treasury Bill rates, Indian Rupee/US dollar exchange rates, and the London Inter Bank Offered Rate (LIBOR) and found the evidences for the existence of strong integration of the domestic call Money Market with the LIBOR and the existence of long-term co-movement between domestic foreign exchange market and LIBOR.

Jasienė & Paškevičius (2009): assessed whether capital and Money Markets develop in parallel, i.e., the development of one market creates the conditions favourable for the growth and development of the other, or the two markets perform as competitors. The result show that the prevailing Macroeconomic environment ensures the parallel development and movement of the share prices and the overnight interest rate.

Nath & Samanta (2003): examines the extent of integration between foreign exchange and stock markets in India during the liberalisation era by employing Granger's causality test in vector auto-regression (VAR) framework and the Geweke's feedback measures and inferred that there is a existence of causal link between returns in two markets.

Gulathi & Kakhani (2012): examined the causal relationship between foreign exchange rates and stock market by applying techniques of Granger Causality test and correlation test and denied the existence of relationship between exchange rates and stock market.

Somasundaram & Muthukumaran (2014): examined the causality relationship between exchange rate and stock returns by using Granger Causality and inferred that the exchange rate neither affects stock returns nor stock return affects the exchange rate.

OBJECTIVE OF THE STUDY:

1. To study the impact of Equity Spot Market on Forex, Money and Index Futures Market

2. To study the causal link between Capital Market, Money Market, Forex and Futures Market in short run.

DATA AND METHODOLOGY

Data for testing the interdependence among various segments of financial market

In order to examine interrelation among different types of financial markets i.e. Capital Market, derivative market, Money Market and Forex market in short run , the basic data used in the study consist of four variables which are S&P Nifty index rates, 3 month S&P Nifty Index Future index rates, repo rate, dollar/rupee exchange rate. The concern data is collected for one year duration, for the financial year 2014-2015. The data is collected from website of National stock exchange of India (NSE) and RBI respectively. The exact days may vary for different rates, depending on the availability of trading information. In case of spot equity index rate and future equity index rate closing prices have been taken into consideration for the study. If there is any missing observation, due to non-trading, on any day, in any market, the common practice is to remove the specific interval from the sample and therefore has been applied here also.

In this study data for only one year is considered because Money Market is a short term market as this study aims at understanding how each market is interrelated in short term period

METHODOLOGY FOR TESTING THE INTERDEPENDENCE AMONG VARIOUS FINANCIAL MARKETS

The data has been tested using simple statistical tools like multiple regression analysis and simple regression analysis for testing the interrelation among various financial markets. Before applying the aforesaid tools, the variables are tested for Stationarity using Augmented Dickey Fuller test.

Stationarity Test

The financial time series data is called stationary if it's mean, variance and auto-covariance at different lags are same and so time independent. For a stationary series,

stocks to the system die away gradually. If the effect of the stocks to the system persists for a longer period, the system will be explosive due to the stock. If the data would not be stationary, no study can be done as non-stationary data lead to spurious regression.

Hypothesis Statement

H0: Variable has a unit root or Variable is not Stationary

H1: Variable does not have a unit root or Variable is Stationary

Augmented Dickey-Fuller unit root Test has been employed to examine the stationary property of the closing price returns of S&P CNX Nifty, S&P CNX Nifty Index Futures, repo rate, dollar/rupee exchange rate. Each series has been tested under following regression equations:

1. Without Constant and Trend $\quad \Delta Y_t = \delta Y_{t-1} + u_t$

2. With Constant $\quad \Delta Y_t = \alpha + \delta Y_{t-1} + u_t$

3. With Constant and Trend $\quad \Delta Y_t = \alpha + \beta T + \delta Y_{t-1} + u_t$

Further difference-stationary process has been used to transform non-stationary series into stationary series. The regression equation for the Difference-stationary process is as follows: $\Delta(\Delta Y_t) = \alpha + \delta \Delta Y_{t-1} + e_t$

Table: 1

Augmented Dickey-Fuller Test for the Variables

Instrument/Indices	At level			At First Difference
	None	Trend	Trend and Intercept	
S&P CNX Nifty Index	(-6.128)	(-6.335)	(-6.471)	
	0.0000	0.0000	0.0000	
S&P CNX Nifty Index Futures	(-5.693)	(-5.892)	(-8.759)	
	0.0000	0.0000	0.0000	

	(-7.059)	(-7.076)	(-7.0598)	
Dollar/Rupee exchange rate	0.0000	0.0000	0.0000	
Repo rate	(-1.000)	(-0.507)	(-1.714)	(-10.93)
	0.282	0.8876	0.745	0.0000

The result of the Stationary test is given in the table.1. All the Variables are found to be stationery at its level and they are significant at 1 % level, since the P-value is less than 0.01, except the Repo rate. Repo rate is also found to be non-stationary in level. Then, unit root test is conducted in first differences. All the series are now found to be stationary or, in other words, they are all I (1) series.

RESEARCH HYPOTHESIS

Firstly, it is argued that there is a significant impact of Spot Market on equity Futures Market and the null hypothesis for the proposed argument is that there is no significant impact of equity Spot Market on equity Futures Market. Later study aims at finding out the impact of Spot Market on Money Market and the null hypothesis for the proposed argument is there is no significant impact of Spot Market on Money Market.

Along with that impact of Spot Market and Forex market has been studied and the null hypothesis for the proposed argument is there is no impact of Spot Market on Forex market and finally interrelationship between all four financial markets have been studied and the null hypothesis for the proposed argument is there is no significant interrelationship among the four markets.

<u>**Simple Regression Analysis**</u>

Regression analysis has been used to find out the significant relationship between index Future and the underlying index considering underlying index as an independent factor and index Future as a dependent Future. Regression analysis helps to understand how the dependent variable changes when the independent variable is varied.

Regression analysis has been used to find out the significant relationship between index Future and the underlying index, considering S&P CNX Nifty index as an independent factor and 3 month S&P Nifty Index Future index rates, repo rate, dollar/rupee exchange rate as an independent factors. Regression analysis helps to understand how

the dependent variable changes when the independent variable is varied. Since study aims at analyzing the impact of Futures on the underlying Spot market.

Regression Equation is as follows: **Y= a+ bX**

<u>Granger Causality Test</u>

Although regression analysis deals with the dependence of one variable on other variables, it does not necessarily imply causation. In other words, the existence of a relationship between variables does not prove causality or the direction of influence. In order to test the causality relationship empirically, it is common to apply the Granger causality test that was initially introduced by Granger (1969) by following the methodology adopted by (Zakaria & Shamsuddin, 2012), (Pathak, 2009), (Nath & Samanta, 2003). In a bivariate framework, the variable y_1 is said to cause the variable y_2 in the Granger sense if the forecast for y_2 improves when lagged variables y_1 are taken into account. In general, conventional Granger causality can be represented by the following bivariate system.

$$y_{1t} = \delta_1 + \sum_{i=1}^{m} \beta_i y_{1t-i} + \sum_{i=1}^{n} \psi_i y_{2t-i} + \varepsilon_{1t}$$

$$y_{2t} = \delta_2 + \sum_{i=1}^{q} \pi_i y_{1t-i} + \sum_{i=1}^{r} \phi_i y_{2t-i} + v_t$$

Four findings are possible in a Granger causality test. First, neither variable Granger causes the other. In other words, independence is suggested when the set of y_1 and y_2 coefficients are not statistically significant in both regressions. Second, unidirectional causality from y_2 to y_2, which means y_2 causes y_1 but not vice versa. Third, unidirectional causality from y_1 to y_2 that means y_1 causes y_2 but not vice versa. Fourth, bilateral causality between two variables, which means y_1 and y_2 Granger cause each other (feedback effect).

In this paper, the relationship between Capital Market, Money Market, Forex and Futures Market will be examined by using Granger causality test. These tests require

that the variables used in a given model be stationary, that is, their stochastic properties are time invariant.

STUDY OF THE IMPACT OF EQUITY SPOT MARKET ON FOREX, MONEY AND INDEX FUTURES MARKET

REGRESSION ANALYSIS FOR SPOT MARKET AND FUTURES MARKET

Theoretically, there is no common consensus of the academicians regarding why derivatives should influence Spot Market volatility. Derivatives increase market liquidity by bringing more investors to the Spot Market by offering an effective mechanism for hedging the risk. This results in a less volatile Spot Market unless derivatives attract mainly uninformed speculators who destabilize the market. Since critics argue that uninformed investors who are getting lured by the leveraged benefits associated with the Derivatives can add a noise to the Futures   Market and can indirectly contribute to the volatility of the Spot Market. Even the transaction cost in Futures Market is lower in comparison with the Spot Market which makes Futures more attractive to the investors.

Spot Market volatility decreases due to the liquidity provided by speculators. This additional liquidity allows Spot traders to hedge their position and thus curb volatility attributable to order imbalance. Several studies like (Pilar & Rafael, 2002), (Bandivadekar & Ghosh, 2003), (Thenmozhi, 2002), (Raju & Karande, 2003), (Sarangi & Patnaik, 2007), (Agarwal, Kumar, Mukhtar, & Abar, 2009), (Thenmozhi, 2002) have concluded that the introduction of Index Futures have lead to the significant decline in the volatility of the Spot Market. The Spot Market may experience an increase in price volatility as Futures trading enhance the price discovery mechanism. So information concerning fundamentals is more rapidly assimilated into price. Several studies such as (Shenbagaraman, 2003), (Rajput, Kakkar, & Batra, 2013) have noticed a rise in the volatility of Spot Index returns after the introduction of the Futures contract. Following is the regression equation for S&P CNX Nifty Index and Nifty Index Futures, wherein S&P CNX Nifty Index is an independent factor and Nifty Index Futures is a dependent factor.

NIFTY FUTIDX = 4.30643e-05 + 0.966493 S&P CNX NIFTY

Table: 2

OLS Model for S&P CNX Nifty Index and Nifty Index Futures

	Coefficient	Std. Error	Z-Statistic	Prob.
Constant	4.30643e-05	0.000112958	0.3812	0.70336
Returns CNX Nifty	0.966493	0.0129636	74.5543	<0.00001

Table 2 exhibits the result of OLS Model for S&P CNX Nifty Index and Nifty Index Futures, wherein S&P CNX Nifty Index is an independent factor and Nifty Index Futures is a dependent factor. The Coefficient of S&P CNX Nifty Index Closing price return is significant at 1% level of significance. R Square of 0.95 signifies that 95% of variation in the NIFTY FUTIDX is explained by the S&P CNX Nifty Index. The Coefficient of CNX NIFTY INDEX of 0.9664 suggests that if the return of S&P CNX Nifty Index is going up by 1% then the NIFTY FUTIDX will go up by 0.096 %.

REGRESSIONANALYSIS FOR SPOT MARKET AND FOREX MARKET

Behavior of the real exchange rate is one of the major determinants of the economic activities. A fall in the real Exchange rate has a positive effect on the competitiveness of domestic goods v/s foreign goods balance of trade of country. This increases the level of aggregate level of demand and level of output. To complete the linkage, influence in reverse direction can be justified by 'portfolio balance approaches' under the exchange rate regime that allows exchange rate to be determined by market mechanism (i.e., the demand and supply condition).

A blooming stock market would attract capital flows from foreign investors, which may cause an increase in the demand for a country's currency. Thus, local currency appreciates. The reverse would happen in case of falling stock prices where the investors would try to sell their stocks to avoid further losses and would convert their money into foreign currency to move out of the country. There would be demand for foreign currency in exchange of local currency. As a result, rising (declining) stock prices would lead to an appreciation (depreciation) in local currency. Moreover, foreign investment in domestic equities could increase over time due to benefits of international diversification that foreign investors would gain. Furthermore, movements in stock prices may influence exchange rates (and money demand) because investors' wealth (and liquidity demand) could depend on the performance of the stock market.

(Apte, 2001) studied the relationship between the volatility of the stock market and that of the nominal exchange rate in India and supported the existence of volatility linkages between these two markets, whereas certain studies like (Gulathi & Kakhani, 2012) denied the existence of any relationship between relationship between exchange rates and stock market. Following is the regression equation for S&P CNX Nifty Index and dollar/rupee exchange rate, wherein S&P CNX Nifty Index is an independent factor and dollar/rupee exchange rate is a dependent factor.

USD/INR = 0.000299 – 0.138 S&P CNX NIFTY

Table: 3

OLS Model for S&P CNX Nifty Index and Dollar/Rupee Exchange Rate

	Coefficient	Std. Error	Z-Statistic	Prob.
Constant	0.000299233	0.000225118	1.3292	0.18503
Returns CNX Nifty	−0.138162	0.0258356	−5.3477	<0.00001

Table 3 exhibits the result of OLS Model for S&P CNX Nifty Index and USD/Rupee Exchange rate, wherein S&P CNX Nifty Index is an independent factor and USD/Rupee Exchange rate is a dependent factor. The Coefficient of S&P CNX Nifty Index Closing price return is significant at 1% level of significance. The Coefficient of CNX NIFTY INDEX of (-0.138) suggests that if the return of S&P CNX Nifty Index is going up by 1% then the NIFTY FUTIDX will go down by 0.0138 %.

REGRESSION ANALYSIS FOR SPOT MARKET AND MONEY MARKET

RBI credit policy is one of the most talked about event in the stock market. One of the key aspects of policy announcement is repo rate changes by the regulator. Repo rate is the key driver for lending in the economy and banks take their call on the lending rate based on the changes in the repo rate.

The increase of the credit price is indicative of the increase in the demand and/or a fall in the supply of financial resources. Analogically, the rising equity price index is a clear indicator that the equity demand exceeds the supply, and that investors show clear preference to the investing in the Capital Markets. On the contrary – the falling equity

index will indicate a decline in the investment into the Capital Market. Theory offers two assumptions underlying the two patterns in the development of the indicators inherent to the two markets (money and capital). The first could be based entirely and solely on the behaviour of investors. Low interest rates offer the conditions more favourable for the investment into the Capital Markets in the expectation that the low interest rates will stimulate a rise in the equity indices. And on the contrary − high interest rates accumulate all resources in the Money Market available for financial investment, which causes a fall in the demand in the Capital Market and, as a result, the equity index declines.

In the second case it is assumed that a favourable macroeconomic environment and the growth of the national economy cause a parallel rise of both the equity price indices and the interest rates. A growing business attracts investment into the Capital Market and the low interest rates are a precondition 71 for the investment into the Capital Markets by absorbing the available capital resources whereas under the recession conditions an entirely opposite trends in the indicators to be analysed might be rightfully expected: declining equity price indices, and rising price of credit resources, i.e., interest rates. Nevertheless, the interest rate decline mechanism may be way more complicated: on the one hand, under the conditions of economic downturn the credit demand weakens which in its turn lowers the credit price, on the other hand, the interest rates might be pushed up due to a higher credit risk characteristic of economic recession periods. Following is the regression equation for S&P CNX Nifty Index and Repo rate, wherein S&P CNX Nifty Index is an independent factor and Repo rate is a dependent factor.

Repo Rate = -0.000688 - 0.34 S&P CNX NIFTY

Table: 4

OLS Model for S&P CNX Nifty Index and Repo Rate

	Coefficient	Std. Error	Z-Statistic	Prob.
Constant	−0.00068761	0.001028	−0.6689	0.50422
Returns CNX Nifty	−0.346949	0.117734	−2.9469	0.00353

Table 4 exhibits the result of OLS Model for S&P CNX Nifty Index and Repo rate, wherein S&P CNX Nifty Index is an independent factor and Repo rate is a dependent factor. The Coefficient of S&P CNX Nifty Index Closing price return is significant at 5% level of significance. R Square of 0.06 signifies that only 6% of variation in the Repo rate is explained by the S&P CNX Nifty Index and the rest remains unexplained. The Coefficient of CNX NIFTY INDEX of (-0.346) suggests that if the return of S&P CNX Nifty Index is going up by 1% then the Repo rate will go down by (-0.0346) %.

GRANGER CAUSALITY TEST RESULT

Granger causality test is used to examine the pair – wise short – run interactions between Capital Market, Money Market, Forex, and Derivatives Futures Market in short run. The Statonarity of the variables is one of the primary conditions for running Granger Causality test. All the series are found to be Stationery at 1% significance level.

Table 5: showing the result for Granger Causality between NSE Indices and their respective Futures contract

Null Hypothesis	F-Stat	P-Value	Result
S&P CNX Nifty Index does not Granger cause S&P CNX Nifty FUTIDX	0.1426	0.8671	Accept
S&P CNX Nifty FUTIDX does not Granger cause S&P CNX Nifty Index	0.4845	0.6169	Accept
S&P CNX Nifty Index does not Granger cause USD/INR Exchange rate	1.0033	0.3682	Accept
USD/INR Exchange rate does not Granger cause S&P CNX Nifty Index	1.8742	0.1558	Accept
S&P CNX Nifty Index does not Granger cause Repo rate	0.1478	0.8627	Accept
Repo rate does not Granger cause S&P CNX Nifty Index	0.5905	0.5549	Accept
S&P CNX Nifty FUTIDX does not Granger cause USD/INR Exchange rate	0.6207	0.5384	Accept
USD/INR Exchange rate does not Granger cause	1.5609	0.2121	Accept

S&P CNX Nifty FUTIDX			
S&P CNX Nifty FUTIDX does not Granger cause Repo rate	0.0031	0.9969	Accept
Repo rate does not Granger cause S&P CNX Nifty FUTIDX	0.4477	0.6396	Accept
Repo rate does not Granger cause USD/INR Exchange rate	0.9395	0.3923	Accept
USD/INR Exchange rate does not Granger cause Repo rate	0.2019	0.8172	Accept

Table 5 shows the results of Granger Causality for S&P CNX NIFTY Index, S&P CNX Nifty Index Futures, repo rate, dollar/rupee exchange rate. Since the P-value is not significant for none of the variable, it's not possible to reject the null hypothesis**. The result of Granger Causality test does not indicate the existence of Causal relationship between any of the variables. For all the variables we didn't find evidence to reject the null hypothesis. One possible reason for inconclusive results can be that the span of time series data is very small (only one year). If the time span is widened for examining the relationship then a sound and conclusive result could be arrived at.

CONCLUSIONS AND FINDINGS

This paper has made an attempt to study the impact of Equity Spot Market on Forex, Money and Index Futures Market by using a simple regression analysis. The result indicates that the Spot Market has a significant impact on the Futures Market and Future Market is highly dependent on the Spot market. But the result of the regression analysis does not suggest the presence of significantly strong impact of Spot Market on Forex and Money Market. The study has also made an attempt to understand the causal link between Capital Market, Monet Market, Forex and Futures Market using univariate Granger Causality, but did not find any evidence for the existence of causal link between these segments of the Financial Market. This might be due to the short span of time series data (only one year). If the time span is widened for examining the relationship then a sound and conclusive result could be arrived at.

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