5. FINDINGS, SUGGESTIONS AND CONCLUSION

5.1 Major Findings of the study

Based on the empirical evidences, the researcher has identified the following findings as a result of the entire study. These findings are classified into different parts according to the analysis. Comparisons are also made to understand the variables in a better way. First four parts finds the stationarity results of the Independent variables and the later findings shows the stationarity test along with long run and short run tests between the independent variables and stock indices.

1. INTEREST RATE

- Graphical analysis and Corrologram shows the signs of unit root in the series. To justify the same a Unit root test was conducted where the probability value was 0.000, also the test-calculated value (4.927971) is more than the tabulated value (2.876927) at 5% level of significance, and hence null is rejected, which says that the series is stationary. Therefore, the Interest rate series is stationary or integrated at order 0.

2. EXCHANGE RATE

- Graphical analysis and Corrologram shows the signs of unit root in the series. To further check with the unit root test, the results of the test showed the signs of unit root. The probability value was 0.8252 and the test calculated value (1.503525) was less than the tabulated value (3.434569) at 5% level of significance, and hence accept the null, which says that the series has unit root and hence not stationary.
- Then the first difference of the series was checked for unit root and found that the graphical analysis and the correlogram had strong correlation. An Unit root test was also conducted and found that the probability value was 0.000 and also the test calculate value (9.491223) was more than the tabulated value (1.942574) at 5% level
of significance, and hence reject the null which says that the series does not have unit root and hence stationery at order 1.

3. INFLATION

- Graphical analysis along with the corrologram shows the signs of unit root, as much correlation could not be seen. Further checked for signs of unit root where the probability value was 0.1774 and the test-calculated value (2.286607) was slightly lesser than the test tabulated value (2.876843) at 5% level of significance. So accept null which says that the series has unit root and hence not stationery.
- Further checked into the first difference of the Inflation series and found that the graphical analysis showed a perfect view of the stationarity. To further confirm the stationarity of the series the ADF test was conducted again and found that the probability value was 0.002 and the test-calculated value (5.129699) is more than the tabulated value (3.434167) at 5% LOS, hence reject the null and the series is stationery at order 1.

4. INDUSTRIAL PRODUCTION

- Graphical analysis and the corrologram showed that the series was stationery, but it looked very important to check for Unit root test. The results of the unit root test showed that the series was not stationery and had the signs of unit root. As the probability value was 0.7801 and also the test-calculated value (1.623791) was less than the tabulated value (3.434167) at 5% level of significance accept the null, which says that the series has unit root and hence is not stationery.
- Further checked into the first difference of the series and found that the graphical analysis showed a perfect view of the stationarity. To further confirm the stationarity of the series ac ADF test was conducted and found that the probability value was 0.000 and the test-calculated value (17.56577) is more than the tabulated value (1.942604) at 5% LOS, hence reject the null and the series is stationery at order 1.
5. **NIFTY 50**

- Graphical analysis and the correlogram tests showed that the series is not stationery. Further ADF test was carried to find out the existence of unit root in the series. The probability value of the series was 0.5142 and also the test calculated value (2.149721) was lesser than the tabulated value (3.435125) at 5% level of significance. Hence the null was accepted and the series was not stationery. Further performed the ADF test with the first difference of the series and the results showed that the series was stationery as the probability value was 0.000 and the test calculated value (15.00547) was more than the tabulated value (1.942624) at 5% level of significance. The null was rejected which means the series is stationery at order 1.

- Further the relationship between the independent variables and the dependent variable (NIFTY 50) was analysed and found some long run and short run relationships.

- No evidence of a long run relationship was found between interest rate and exchange rate with NIFTY 50.

- From the four factors least square test there was no evidence of any long run relationship. So to further look into the relations only the series with integration of order 1 were included and conducted the test again. The probability value for Inflation series showed 0.000, so to confirm the same checked for Inflation and NIFTY 50. The residual values were tested for ADF unit roots. The probability value was 0.0136 and hence say that there exists a long run relation between NIFTY 50 and Inflation.

- Long run relation exists between NIFTY 50 and Inflation rates

- Further looking into the short term relationships, a unidirectional short term relationship exists from Nifty 50 to Interest rate as the probability value is 0.0207 which is less than 10% and Inflation to NIFTY 50 where the probability value is 0.0386

- A long run relationship between Interest rate and Exchange rate was not found.
6. CNX AUTO

- From the Graphical analysis it was not clear whether the series was stationery. So conducted a correlogram and ADF unit root test. The test results showed that the series was not stationery as the probability value was 0.3030 the test calculated value (2.552165) was lesser than the tabulated value (3.448348) and hence accept the null which says the series is not stationery.

- Further the stationarity of series at order 1 was checked and found that the series calculated value (6.922259) was more than the tabulated value (1.943563) at 5% level of significance and also the probability value was 0.000. Hence reject the null and the series CNX AUTO is integrated of order 1.

- Further analysed the relationship between the independent variables and the dependent variable (CNX AUTO) and found some long run and short run relationships.

- A long-run relationship was found between interest rate with CNX AUTO was evidenced.

- Exchange rate and CNX AUTO are related in long run as the probability value is 0.0249 which is less than 5%.

- Further short run unidirectional relation between CNX AUTO to Industrial Production was seen as the probability value is 0.0432

7. Comparison of results between CNX AUTO and NIFTY 50

- Similar long run relations found between NIFTY 50 and CNX AUTO wan not evidenced.

- The short run results are also not similar between NIFTY 50 and CNX AUTO
8. CNX BANK

- The graphical analysis and the correlogram showed the existence of unit root in the series also confirmed by the unit root ADF test where the calculated value (2.664584) is lesser than the tabulated value (3.448681) with a probability value of 0.2533 and hence the series is not stationery at order 1. Further analysed the stationarity of the series with its first difference and returns and found that the probability value was 0.000 and hence the series is stationery and the series is integrated at order 1.
- Further analysed the relationship between the independent variables and the dependent variable (CNX BANK) and found some long run and short run relationships.
- A long-run relationship was not found between interest rate and CNX BANK whereas a significant long run relationship exists between Exchange rate and CNX BANK as the probability value was 0.0006
- Long run relationship exists between CNX BANK and Inflation as the probability value was 0.0521 which is very close to 5%.
- A unidirectional short run relationship exists between CNX BANK to Interest rate where the probability value is 0.0559 and from CNX BANK to Inflation rates where the probability value is 0.0011

9. Comparison of results between CNX BANK and NIFTY 50

- No similar long run relations found between NIFTY 50 and CNX BANK except for Inflation.
- In short run both NIFTY 50 and CNX BANK has a short run relationship with Interest rate
- No evidence of any short run relation with exchange rate for both the indices
10. CNX FMCG

- The graphical analysis showed the signs of unit root. To confirm this, an ADF unit root test was performed and the results of the test confirmed the existence of unit root and the series is not stationery as the probability value was 0.6317 and the test-calculated value (1.931711) was lesser than the tabulated value (3.448021) at 5% level of significance.
- Further analysed the series with its first difference and found that the ADF test results, graphical analysis and the returns confirmed that the series is stationery. The ADF test calculated value (9.726577) was greater than the test tabulated value (3.448348) at 5% level of significance and the probability value was 0.000
- No evidence of a long run relationship was found between interest rate and CNX FMCG whereas a significant long run relationship exists between Exchange rate and CNX FMCG as the probability value was 0.0000
- Long run relationship exists between CNX FMCG and Industrial Production as the probability value is 0.0051
- A unidirectional short run relationship exists between CNX FMCG to Exchange rate with a probability value of 0.0000 and from Industrial Production to CNX FMCG with a probability value of 0.0551

11. Comparison of results between CNX FMCG and NIFTY 50

- No similar long run relationships found between NIFTY 50 and CNX FMCG
- In short run, NIFTY 50 has a relationship with Interest rate but CNX FMCG has a relationship with Exchange rate
12. CNX IT

- Graphical analysis and the correlogram showed the existence of Unit root in the series. To confirm the same an ADF test was conducted and the results of the test showed that the test calculated value (1.978857) was lesser than tabulated value (2.886290) at 5% level of significance. The probability value of 0.2958 also confirms the existence of unit root.

- Further the first difference of the series was tested for ADF unit root. Both graphical analysis and the Unit root test proved that the series was stationery at order 1. The test calculated value (47.16602) was more than the test tabulated value (1.943587) at 5% level of significance. The probability value of 0.000 also proves that the series is stationery.

- Long run relationship does not exist between any of the independent variables with CNX IT.

- Bidirectional short run relationship exists between Exchange rate and Inflation with CNX IT with a probability value for exchange rate of 0.0000 and 0.0512 and for inflation rate of 0.0213 and 0.0430.

- Unidirectional relationships exist between Interest rate and Industrial Production with CNX IT with the probability value for Interest rate with CNXIT of 0.0000 and Industrial production with CNXIT of 0.0005.

13. Comparison of results between CNX IT and NIFTY 50

- No similar long run relationships found between NIFTY 50 and CNX IT
- In short run, NIFTY 50 has a relationship with Interest rate but CNX IT has a relation with Exchange rate and Inflation
- Impact of Inflation can be found both on NIFTY 50 and CNX IT
14. CNX REALTY

- The output of Graphical analysis and the correlogram showed the signs of unit root in the series. The ADF unit root test results also confirm that the series is not stationery as the probability value is 0.3017 with the test calculated value (2.555096) is less than the test tabulated value (3.463547)
- Further the graphical analysis and the correlogram of the first difference of the series shows that the series is stationery, to confirm the same the ADF test results proved that the series was stationery at order 1. The test-calculated value was more than the test-tabulated value at 5% level of significance.
- Long run relationships exists between CNX REALTY with Exchange rate as the probability value is 0.0309 and CNX REALTY with Industrial Production with a probability value of 0.0332
- There does not exist any long run relationship with CNX REALTY and Interest rate
- A unidirectional short run relationship exists between CNX REALTY to Industrial Production with a probability value of 0.0092 and also can be seen from Exchange rate to CNX REALTY with a probability value of 0.0272

15. Comparison of results between CNX REALTY and NIFTY 50

- No similar long run relationships found between NIFTY 50 and CNX REALTY
- In short run, NIFTY 50 has a relationship with Interest rate but CNX REALTY has a relation with Industrial Production. Short run relationship can also be found with Inflation to NIFTY 50 and from Exchange rate to CNX REALTY.
16. SENSEX

- The graphical analysis and the correlogram shows the signs of unit root. So the series is not stationery at its present order of integration. To further confirm this the ADF unit root test also confirmed that the series is not stationery as the test calculated value (1.804752) was less than the tabulated value (3.434036) at 5% level of significance. The probability value (0.6987) also confirmed that the series was not stationery.
- Further the first difference series confirmed that the series was stationery at order 1 as the test calculated (12.24115) value was greater than the test tabulated value (1.942545) at 5% with a probability value of 0.0000
- No evidence of a long run relationship was found between Interest rate and Exchange rate with SENSEX.
- Long run relationships do not exist between SENSEX with any of the independent variable.
- A unidirectional short run relationship exists between Industrial Production with BSE SENSEX with a probability value of 0.0509
- A Bidirectional causal relationship can also be seen between Exchange rate series and BSE SENSEX with probability values of 0.0502 and 0.0008

17. Comparison of results between BSE SENSEX and NIFTY 50

- No similar long run relationship can be found between NIFTY 50 and SENSEX
- No similar short run relationships are evidenced between NIFTY 50 and BSE SENSEX
5.2 SUGGESTIONS:

Impact of Macroeconomic variables on stock prices is a very relevant and important topic in current market conditions as these variables are considered as a measure in accessing any given market at a given period of time. The independent variables considered in this study play a vital role in making appropriate investment decisions in different stocks by individual investors as well as for stock brokers to make appropriate and timely suggestions to their clients. Interest rate and Exchange rate are affecting the stock prices considered in this study to a remarkable extent, few in the long run and few in the short run. Investors and stock brokers should consider the below points before making any investments:

- Interest rates do not impact stock prices in long run
- Exchange rate has an impact on CNX AUTO, CNX BANK, CNX FMCG and CNX REALTY in the long run
- Interest rate is impacting CNX IT in short run
- NIFTY 50 and CNX BANK is having a causal relationship with Interest rate in short run.
- Exchange rate is causing CNX IT and SENSEX and vice versa in short run.

From all the above points it is clear that Exchange rate has an impact on stock indices especially with respect to AUTO, BANK FMCG and REALTY sectors in long run, IT and REALTY sectors in short run. Interest rate does not show much of an impact both in short and long run. Investors and Stock brokers should consider the above parameters while investing in stocks to maximize their profits and minimize loss.
5.3 CONCLUSION

This study attempts to investigate the relationship of stock prices with interest rate and exchange rate in India for the period of 1999 to 2014 using different econometric frameworks. The results of unit root test show that Interest Rate series is integrated at level and all the other data series of the variables are non-stationary at level and integrated of order one.

Regression analysis suggests that no long run relationship between Interest rate and Stock prices considered. However the Exchange rate has a long run impact on the sectoral indices like CNX AUTO, CNX BANK, CNX FMCG and CNX REALTY. Both NIFTY 50 and SENSEX do not show long run relationships with either Interest rate or Exchange rate.

Granger causality test suggests many short run relationships between the variables. Some unidirectional and a few bidirectional relationships were evidenced. A unidirectional relation exists from Nifty 50 to Interest rate, CNX BANK to Interest rate, CNX FMCG to Exchange rate, Interest rate to CNX IT and from Exchange rate to CNX REALTY. A bidirectional relationship exists between CNX IT and Exchange rate, SENSEX and Exchange Rate.

From the above inferences it is evident that Interest rate does not have much of an impact on stock prices either in long run or short run, whereas Exchange rates have an impact both in long run and short run. To conclude, Foreign Exchange markets and Stock markets are integrated in long run and short run where as Interest rates do not show much of an impact on stock Prices.
5.4 DIRECTIONS FOR FURTHER RESEARCH:

This study opens up new grounds for further research. Further studies can address the following issues to have more insights on the subject.

- Building a model that would be helpful to forecast the impact of different macroeconomic variables on different stock indices for different time periods both in long run and short run. This would help investors, stock brokers, financial advisers, and the government bodies to make their decisions time to time.

- Further, studies can extend to other indices and macroeconomic variables which may lead to the generalization of the findings of the study and also help researchers examine in detail.

- Another interesting dimension would be to find out the effect of macroeconomic variables on stock prices in an international perspective by taking stock indices of different stock markets into consideration.