

CHAPTER-2

Review of Literature, Scope and Plan of the Study

CHAPTER-2

2.1 Introduction:

In the literature of financial integration quest of the scholars to investigate the issues on integration of international financial markets is found more than the domestic financial integration leading to a big gap in both the theoretical and empirical literature on integration of financial markets. In fact, the literature on domestic financial integration is in its infancy.

The quantitative analysis of integration of domestic financial markets dates back to Gordon de Brouwer's (1995) study of changing relationship between non-traded and traded financial instruments, especially between money market and institutional interest rates under the regulated and free-market regimes. Considering the importance of competition, financial liberalization and permanency of money market interest rate shocks, the author positively argued in favour of integration of money market which ultimately signals broader and more fundamental financial integration. His sample countries consisted of eight Western Pacific economies, namely, Australia, Hong-Kong, Indonesia, Malaysia, Philippines, Singapore, Taiwan and Thailand along with Canada, Japan and United States of America. He attempted to develop a model to assess the structural and dynamic relation between money market rates and deposit and lending rates based on banks' assets (reserves and loans) and liabilities (money market borrowings, deposits and equity) along with the (i) probability of payment of loan interest, (ii) default in loan principal, and (iii) monopoly of banks in the lines suggested by Lowe (1995). In sum, the author assessed the integration of domestic financial markets by estimating the relation between (i) money market rates and deposit rates and (ii) money market rates and loan rates over a period of 20 years, dividing the entire period in four sub-periods. The study considered monthly data for all the rates collected from various sources available in the economies under the study. Call and overnight borrowing rates were

considered to represent money market rates and CD rates for some countries to surrogate the deposit rates. He had reported (i) non-stationarity in all the monthly rates at level, (ii) strong positive and statistically significant correlation between Call and CD rates, and (iii) the presence of integration amongst the rates under the study. The author also found that correlation and integration were more robust in developed countries like Canada, Japan and United States of America.

Various policy prescriptions of financial reform were undertaken by the Government of India in the 'free – regime'. She implemented the major suggestions initially recommended by Chakraborty Committee (1985) followed by Vaghul Working Group (1987), the Narashimham Committee (1991), M. Narashimham Committee (1997), and many other committees. The major suggestions of the committees were to integrate the various segments of the financial markets so as to achieve a higher level of efficiency and elimination or reduction of arbitrage opportunity, if exists, in the financial markets. To assess the state of integration of the markets after implementation of the recommendations of above mentioned committees, Bhoi and Dhal(1998) attempted to empirically evaluate the level of convergence of Indian financial markets. The authors, firstly, searched the reference rates of the markets on the basis of the descriptive statistics, tested the stationarity of the variables under their study and then conducted the Granger causality test with the qualified reference rates. In their unit root test based on the methodology suggested by Phillips-Perron(1998), they found all the rates save call rate are non-stationary. In the context of call rates, they considered a three-month moving average of the same which turned out to be a non-stationary one, hence, included the three-month moving average rate (call money rate 3) in their main frame of the study. In estimating the relationship, they argued that the causal relationship and the size of long-run elasticity are important facts for any meaningful study of integration of different segments of the financial market. The set of variables, finally, under their study included the

rates of call money (CMR), certificates of deposits (CDR), commercial paper (CPR), deposits (DRT), lending (LRT), 91-day Treasury bill (G91), 364-day Treasury bill (G364), and return on capital (RE) consisting of capital gains and dividend yields, price-earning ratio (PERN) of 100-scrip National Index, 3- month forward premium (FRWD3), 6-month forward premium (FRWD6) of the US dollar and the US Treasury bill rate (USTB). The paper examined the monthly rates/returns covering 60 months from April 1993 to March 1998 only. The study reported a bi-directional causality between call and foreign exchange market (forward premia), between money (91-day Treasury bill rate) and foreign exchange market (forward premia). But at a higher level of significance, they found no causal link between capital market, money and credit market and no integration in capital and call money markets. In the context of only the money market rates, their bi-variate cointegration test results indicates that (i) that commercial paper rate and call money rate 3, (ii) certificate of deposits rates and call money rate 3, and (iii) commercial paper rate and certificate of deposits rates were integrated. In the multivariate analysis, considering the performance of the variable 91-day Treasury bill rate, they posited that Treasury bills market is the prime mover of the money market rates. Their attempt to find convergence of various financial markets yielded mixed results and the integration of domestic and overseas financial markets was not robust.

Jena et al.(2004) conducted a similar study to examine the impact of the policy and institutional reforms in India on narrowing down the inter market divergence empirically and attempted to provide some lights on the domestic market integration in India. They argued that in the post-independence but pre-reform period the Indian financial institutions and markets were under 'control regime' causing the financial system to remain in a highly segmented and inefficient state. They considered seven variables -- call money rate (CMR), certificate of deposit rate (CDR), commercial paper rate (CPR), 91-day Treasury bill rate (TB-91), prime lending rate (PLR), 3-months forward premium (FRWD), and price earnings

ratio of 100 scrips BSE index (PER). The variables under their study covered five markets viz. money market, credit market, capital market, government securities market and foreign exchange market for the purpose of testing the market integration hypothesis. The authors used monthly data spanning from March 1993 to March 2002 and found all the variables were integrated at order one at level excepting call rate. Like Bhoi and Dhal (1998), they also considered a three-month moving average of the call rates which turned out to be a non-stationary one. The study reported the presence of causality amongst the short-term interest rates but no causality between short and long term rates. Money market and foreign exchange market had shown high degree of integration between them. They found a lower degree of integration between money market, government securities market and credit market and positive relation amongst call, exchange, treasury bills and stock market. Amongst the money market instruments, they reported a long term stable and positive relation between the three-month moving average of call rate and 91-days Treasury bills but no integration between (i) certificate of deposit rate (CDR) and 91-days Treasury bills and (ii) commercial paper rate (CPR) and 91-days Treasury bills. However, on the basis of the results of both the correlation matrix and the cointegration test, they observed that there seemed to be no long-run relationship between the capital market and other short-term markets. Finally the authors suggested that while the reform process had helped in removing institutional bottlenecks to the free flow of capital across various segments of Indian financial market; the event had not yet been translated into complete integration among them. After closely scrutinising the paper it is found that: (i) 'Impulse Response Accounting' which is considered as a vital tool to identify the status of integration of the markets are not explored, (ii) which market(s) is(are) in the cointegration space is not tested and reported, (iii) the authors have not considered the three-month moving average of the call rate for their study when selecting the reference rate (Table-1 of their article) and, last but not the final one (iv) the markets under their

consideration are highly liquid markets and are expected to react fast on the arrival of news, hence, monthly data of the call rates which is again averaged (3-month moving average) loses some, may be vital, information . Gross information is expected not to represent and infer information about the activities of the market properly. Despite their best efforts, without resolving and giving a clear and meaningful direction towards the integration of Indian money market, the study itself raised the issue to be researched further.

Sanati (2010) assumed that the increasing gross flow of capital across borders and increasing correlation among different asset returns of major financial markets in the last couple of years , inter linkage across different segments of financial, domestic as well as international, markets has increased. To test the domestic integration she considered returns of call, treasury bills-91days and treasury bills-364 days to represent money market, log of BSE indices and 10-year yield on Government securities to represent capital market and foreign exchange rates from spot, one, three and six-month's forward markets to represent foreign exchange market. The author considered the monthly data and started with the correlation technique dividing the total sample period (1993 – 2007) into two- from 1993 to 2000 and from 2001 to 2007. She found contradictory results of correlation amongst the variables for the periods especially in the context of (i) exchange rates and all the other variables and(ii) stock market and yield on 91 days treasury bills. The results were not surprising as the author conducted the study on the basis of almost low frequency data covering a period under the Information Technology-Knowledge boom. She then investigated the same on the basis of the methodology provided by Johansen and Juselius (1990,1994) for co-integration test in both the multi-variate and bi-variate framework. The author claimed co-movement among the domestic money, capital and foreign exchange markets with strong co-movement between the short-term money and foreign exchange markets. The cross-country analysis, in terms of the short-term inter-bank rate, showed convergence of two different clusters of countries with

Canada, Germany, India, and the UK figuring as common members in both the clusters. Also, her stochastic time series analysis showed that the Law of One Price (LOOP) held good for Indian call money market rates. The findings based on the 91 day Treasury Bill rate and the 10-year government bond yield revealed very weak cross-border co-integration.

Kumari and Mahakud (2012) investigated the relationship between stock prices, exchange rate and demand for money in the post-liberalisation period in India using monthly data from 1996:1 to 2010:8. The test results disclosed the presence of more than two co-integrating vector for each money demand specification. They also found that money demand function was sensitive to inflation, stock prices and economic activity. Unidirectional causality was reported flowing from stock prices and exchange rate to demand for money function.

Paramati and Gupta (2013) investigated the relationship between call money rates, exchange rates and stock returns of India using monthly data for the time span of April 1992 to March 2011. The variables under their consideration are call money rates (monthly weighted average), exchange rates (monthly US Dollar average against Indian rupee), monthly closing price indices of BSE SENSEX 30 and NSE-S&P CNX Nifty. They reported that call money rates are $I(0)$ and exchange rates and the stock returns are $I(1)$ at log-level. Result from Granger causality test evidences bidirectional relationship between call money rates and exchange rates and virtually no causation at less than five percent level of significance. To explore lead-lag interaction among the variables, VAR model is used and the results suggest no evidence of lead-lag causation from stock returns to call money and exchange rates.

Capital flows and propagation of information between financial markets gradually increasing within and across economies due to the continuous development of the global economy, the economic globalization and deepening of financial liberalization. Thus, linkage between various segments of the domestic financial markets is visible and increasingly significant

when openness and marketization of financial market of an economy moves faster. In the context of China, Yu and Liao (2017), attempted to measure the mean spillover effect and volatility spillover effect using daily data for the period June, 2000 to December 2016, taking stock, money (represented by call rates) and foreign exchange market. They used VAR (7)-GARCH (1,1)- BEKK model. The results of the mean spill over test show yields of foreign exchange market influences the stock prices but stock market has no influence on foreign exchange market and asymmetrical bidirectional mean spill over between stock and money market and money and foreign exchange market. The results of the volatility spillover tests show bidirectional spillover of the volatility from foreign exchange market to money market and unidirectional from stock market to money market and money market to foreign exchange market .

Abbas et al, (2017) examined the relationship between stock market (KSE-100), money market (M2 and 180 days T-bill rate), and foreign exchange market (ER: PKR/USD) in Pakistan. They used monthly data covering the period from 2000:M1 to 2015:M12. The study investigated long-run equilibrium relationship among three financial markets on the basis of the Johansen and Juselius cointegration tests, Granger causality in vector error correction model (VECM) framework and pair wise Granger causality tests. They found all the variables under their study are I(1), one cointegrating relation in trace test and no integration in lamda –max test. They claimed existence of the long-term significant relationship among stock market , money market and foreign exchange market and no significant relation in the two sub-periods studied. They also reported positive relation between stock and money market and negative relation between stock and treasury bills and exchange rates. It is very interesting to note that they found positive relation with one component of the money market and negative in another. In pair wise causality , they found unidirectional causality flows from treasury bills to stock and money supply, foreign exchange to money supply and

treasury bills and no causal relation between stock and both the money supply and foreign exchange. In VECM set up, causality flows from treasury bills, money supply and foreign exchange to stock market. According to the CUSUM test, they found no structural break in their system studied. The major problems with their paper are, (i) how they selected the optimum lag- order is not clear, (ii) significance of the variables in the cointegrating space is not reported, (iii) non-reporting or estimating the impulse response analysis to attest the results of granger causality test quantitatively, and (iv) absence of variance decomposition analysis to assess the future flexibility and integration among the markets.

Integration of domestic financial markets is not a well examined issue in the literature of financial integration. In this context, one can get a fair idea about the relationship amongst the markets from the empirical analyses of some scholars who have studied the relationship among the variables representing domestic financial markets in a different perspective, considering several other macroeconomic or financial variables along with the market variables. Bhattacharya and Mukherjee (2003) investigated the nature of the causal relationship between stock prices and macroeconomic aggregates of the foreign sector in India. Using monthly data for the period 1990-91 to 2000-01, they suggested that demand for money affects interest rate. Chakraborty (2012) examined whether there is any evidence of fiscal deficit determining interest rate in India, by using the high frequency macro data of financially deregulated regime from the period of 2006-07 to 2011. Quite contrary to the debates in the policy circles, using the asymmetric vector autoregressive model, they found that increase in fiscal deficit does not cause the rise in interest rates. The long-term and short-term interest rates were studied to determine the occurrence of financial crowding out, but fiscal deficit did not appear to be causing both short and long term rates. Jain and Bhanumurthy (2005) examined the issue of integration of financial markets in India in the post-1991 period by using monthly data of call money rates, 91 day Treasury Bill rates,

Indian Rupee/US dollar exchange rates, and the London Inter Bank Offered Rate (LIBOR). The study found a strong integration of the domestic call money market with the LIBOR and a long-term co-movement, although not robust, between domestic foreign exchange market and LIBOR. They suggested that, more policy measures are necessary to increase integration of financial markets which would help in reducing the arbitrage advantage in some specific segment of the Indian financial markets. Rowe et al, (1986), studied the term structure of the interest rates based on the expectation theory and found positive and statistically significant relation amongst T-Bills yields, CD, CP and Call rates (represented by LIBOR).

Machado et al, (2017), examined the relationship between index of Brazilian Stock Exchange i.e, Ibovespa and interest rates, exchange rate, long term economic activity, money supply and imports. They used monthly data from the period January, 1999 to June, 2017 and used Markov- Switching model. They found that the interest rate and exchange rate are positively related with the stock market index and there was no significant relation between Ibovespa and inflation.

Bernardelli and Castro, (2020) examined the relationship between Brazilian stock market and Selic, that is, short run interest, exports, GDP, exchange as a percentage of GDP, index of Dow Jones for the period of January, 2003 to March, 2019. They have used monthly data and according to the ADF and PP test, they found Brazilian stock index Ibovespa, GDP and exchange rate are $I(0)$ and, Dow Jones index are $I(1)$. They used OLS method and found negative relation between stock market and exchange rates and short run interests and positive relation with the GDP.

There are other studies also which have been done in these areas however, for the sake of brevity, other research works which have been done in this area is given in a synoptic manner

depicting the relationship amongst the variables representing domestic financial markets below:

Table – 2.1

Synoptic View Depicting the Relationship Amongst the Variables Representing Domestic Financial Markets

Authors/Study	Variables/Markets	Data Period	Methodology	Findings
1. Stievers and Sun (2002)	Stock and bond market of United States	1988- 2000	Correlation, GARCH and regime shifting model	Stock and bond returns tend to move substantially together during periods of lower stock market uncertainty and exhibit little relation or even a negative relation during periods of high stock market uncertainty
2. Muhammad and Rasheed (2002)	Stock and Exchange market of India, Pakistan, SriLanka and Bangladesh	1994 - 2000	Cointegration and error correction model	Stock prices and exchange rates are unrelated (at least in the short run)
3. Kasman (2003)	Stock prices and Exchange rate of Turkey	1990 - 2002	Johansen’s cointegration and Granger non- causality	Long run stable relationship exists between stock indices

Authors/Study	Variables/Markets	Data Period	Methodology	Findings
			test	and exchange rate but causality flowed only from exchange rate to industry sector index.
4. Nath and Samanta(2003)	Stock prices and Exchange rate of India	1993 - 2002	Granger Causality and Multivariate Cointegration test	Returns in foreign exchange and stock market are not inter-related
5. Phylaktis and Ravazzolo (2005)	Stock prices and exchange rates of HongKong, Malaysia, Singapore, Thailand and Philippines.	1980 - 1998	Cointegration methodology and multivariate Granger Causality test	Close association between stock and foreign exchange markets.
6. Wong et al., (2005)	Stock indices of Singapore and the United States	1982 - 2002	Cointegration tests, and fractional testing methodology and Granger causality.	Changes in Singapore's stock prices in general formed a long run equilibrium relationship with interest rate and M1 but the same was not applicable in the case of the United States.

Authors/Study	Variables/Markets	Data Period	Methodology	Findings
7. Acikalin et al., (2008)	Stock exchange market returns, production levels, interest rates, foreign exchange rates and current account deficits of Turkey	1991 - 2006	Cointegration tests, a vector error correction model and causality tests	Stock price index is cointegrated with production, exchange rate, interest rate and current account balance — which provides a direct long-run equilibrium relationship.
8. Ray (2008)	Exchange rates, stock market index, foreign institutional investments, index of industrial production and money supply (M3).	1995 - 2007	Co- integration test and Granger causality test.	In the long-run, the exchange rates were found to be positively related to stock prices and money supply; negatively related with output and foreign institutional investments.
9. Banerje and Adhikary (2009)	Exchange rate between Bangladesh Taka and U.S. Dollar	1983 - 2006	Unit root test and co-integrating test	A long-run equilibrium relationship existed among the variables

Authors/Study	Variables/Markets	Data Period	Methodology	Findings
				and flowing from interest rate and exchange rate changes to stock market returns in Bangladesh.
10. Aliyu (2009)	Stock prices and exchange rate in Nigeria	2001- 2008	Co –integration and Granger Causality test	Existence of long run equilibrium relationship between the stock prices and exchange rate.
11. Rahman and Uddin (2009)	Nominal exchange rates of US dollar, euro, Japanese yen, pound sterling and monthly values of Dhaka Stock Exchange.	2003- 2008	Co –integration and Granger Causality test	No cointegrating relationship between stock prices and exchange rates. However stock prices Granger cause exchange rates of US dollar and Japanese yen but there is no two way causal relationship between stock prices and

Authors/Study	Variables/Markets	Data Period	Methodology	Findings
				exchange rates of euro and pound sterling.
12.Ooi.et al., (2009)	Exchange rate and stock prices of Thailand and Malaysia	1993- 2003	Unit root test, co- integration test, Causality test and Variance decomposition test.	Granger causality is unidirectional. Causal relationship from stock prices to exchange either within country or across countries for the case of Thailand and Malaysia
13. Khrawish et al.,(2010)	Interest rate and stock market capitalization rate in Amman	1999 - 2008	Time series analysis and regression analysis.	Significant and positive relationship was found between government prevailing interest rate (R) and stock market capitalization rate (S). Moreover it was seen that government development stock rate (D)

Authors/Study	Variables/Markets	Data Period	Methodology	Findings
				exerted negative influence on (S); significant and negative relationship between (R) and (D)
14. Alagidede et.al., (2011).	Stock markets and foreign exchange markets in Australia, Canada, Japan, Switzerland, and UK	1992 - 2005	Unit root and co – integration test , Granger causality test and Non-parametric causality test.	No long run relationship between foreign exchange markets and stock markets; Causal linkage from exchange rate to stock prices in Canada, Switzerland, and UK.
15. Kutty (2010)	Stock price and Exchange rate in Mexico	1989 - 2006	Unit root test, co – integration test and granger causality test.	Short run relationship found between stock prices and exchange rates. Granger causality tests revealed that stock prices lead exchange rates in the short run, and

Authors/Study	Variables/Markets	Data Period	Methodology	Findings
				there was no long run relationship between these two financial variables
16. Islami (2011)	Foreign exchange market and stock exchange market of Ireland, Portugal, Spain, Greece, Poland, Czech Republic, Slovenia, and Hungary	1998 - 2000	Unit root test, co – integration test and granger causality test.	Significant links exist between the stock market index and foreign exchange rate for five countries, where for Poland both long term and short-term links exist.
17. Gurgul and Lach (2012)	Exchange rate and stock market rate of Switzerland and Poland	2001 - 2008	Linear and Non –Linear Granger Causality test.	Strong linear causal relationship in the direction from stock market to exchange rate for Switzerland as well as existence of strong causal influence of stock market

Authors/Study	Variables/Markets	Data Period	Methodology	Findings
				returns on fluctuations of exchange rate in both countries
18. Gulati and Kakhani (2012)	Indian stock indices and INR-USD exchange rate	2004- 2012	Granger Causality test and Correlation Method	No relationship between SENSEX and foreign exchange rate (INR/\$) as well as no relationship between Nifty 50 and foreign exchange rate (INR/\$).
19. Malarvizhi and Jaya (2012)	Exchange rate and the value of S&P CNX NIFTY Index.	2001 - 2011	Unit root test, co – integration test and granger causality test.	No cointegration vector between nifty and exchange rate. bidirectional causal relationship between exchange rate and nifty.
20. Pallegedara (2012)	Share price index of Colombo Stock Exchange and the Sri Lanka interbank offer rate.	2004 - 2011	Unit root test, Johansen cointegration method, vector error correction	Unit root tests result concluded that both stock market performance

Authors/Study	Variables/Markets	Data Period	Methodology	Findings
			<p>model, granger causality test and the impulse response analysis.</p>	<p>and interest rate variables were non stationary and order of integration of I(1). The results of the Johansen cointegration test indicated a long run cointegration movement between stock market performance and short term interest rate. However the estimation of VECM model, revealed negative long run relationship between stock market returns and short term interest rate . However, results of the Granger causality test indicated no</p>

Authors/Study	Variables/Markets	Data Period	Methodology	Findings
				short run causal relationship between stock market returns and interest rate. IRF analysis revealed permanent negative impact on stock market performance as a result of a shock to the short term interest rate.
21. Addo and Sunzuoye (2013)	Treasury bill rate, interest rate and stock market return of Ghana stock exchange.	1995 - 2011	Time series , coinintegration test, multiple regression model	Weak negative relationship between interest rate and stock market returns and a weak negative relationship between Treasury bill rate and stock market returns as well.
22. Ali et. al,(2013)	Stock prices and exchange rate of Brazil, Russia, India	2003 - 2010	Stationarity test and Tada Yamamoto	In pre-crisis period, Russia and India

Authors/Study	Variables/Markets	Data Period	Methodology	Findings
	and China		Causality test.	<p>showed uni-directional relation moving from stock market to exchange market, whereas, Brazil showed bidirectional and no relation was found in China. During crisis period, Brazil and India showed unidirectional relation running from stock prices to exchange rates. However, Russia evidenced the bidirectional relation and china showed no relationship. In post crisis period, no changes in the results of China</p>

Authors/Study	Variables/Markets	Data Period	Methodology	Findings
				and Brazil and Russia revealed stability in the relationship during crisis and post-crisis.
23. Tavakoli and Dadashi (2013)	Stock and exchange markets in Iran and South Korea.	2002 - 2012	(MGARCH) BEKK method	Bidirectional relationship between two markets in South Korean economy and only a unidirectional relationship from exchange market to stock market in Iranian economy.
24. Lee and Zhao (2014)	Stock market prices and exchange rates in China	2002 - 2012	Unit root test, Co-integration test, vector error correction estimates, block exogeneity Wald test, impulse responses, variance decomposition technique and	Existence of long-run causality from exchange rates to stock prices in Chinese stock markets. The short-run causality from Japanese yen and Korean won exchange

Authors/Study	Variables/Markets	Data Period	Methodology	Findings
			structural break test	rates to Chinese stock prices exists.
25. Aamd and Dg (2014)	Exchange rate and stock market returns in Sri Lanka.	2003 - 2012	Unit root test, Granger Causality test and regression analysis	One-way causality which is stock return does Granger Cause exchange rate but exchange rate does not Granger Cause stock returns. However regression analysis showed no relationship between exchange rate and stock returns.
26. Odoyo et al.(2014)	Stock prices and exchange rates in Kenya	2012 - 2013	Regression analysis	Strong, positive correlation between Foreign Exchange Rates represented by the Kenyan shilling to the US Dollar and the Stock price index as

Authors/Study	Variables/Markets	Data Period	Methodology	Findings
				provided by the Nairobi securities exchange 20-share Index.
27. Paul and Uriam (2014)	Stock and foreign exchange market of Fiji	2010 - 2012	Unit root test, cointegration test and granger causality test.	There is cointegration and therefore long term trend relations found between FJ dollar / US dollar, and the market capitalization index of Fiji.
28. Aikaterini (2014)	Stock prices and exchange rates in US and Asian markets.	2004 - 2014	Cointegration test and granger causality test.	Unidirectional causal relationship from Nikkei to dollar-japanese yen in the short run whereas positive relationship between stock price and exchange rates in the long run. However consumer price index in Japan

Authors/Study	Variables/Markets	Data Period	Methodology	Findings
				seems to have a significant negative effect in stock price and as a result a change in the one variable will cause a negative change on the other.
29. Ray and Sarkar(2014)	Index of Industrial Production (IIP), Whole Sale Price Index(WPI), Money Supply (M3), Yields on 91-day Treasury Bills (YTB), Yields on Long-term (10-year) Government Bonds (YLGB), Competitiveness of Domestic Currency measured by the price of one US \$ expressed in terms of Rupee (EX) and the BSE SENSEX 30(Index) to represent Stock market prices	1991 – 2008	Unit root test, co – integration test and granger causality test.	Indian Stock Market leads the economic activities and the core determinants of the asset market are the markets itself, IIP,money supply and exchange market.

Authors/Study	Variables/Markets	Data Period	Methodology	Findings
30. Abbas et al, (2017)	Stock(KSE-100), 180-day treasury bills, money supply and foreign exchange rate (PKR/USD)	2000-2015	Unit root test, co – integration test and granger causality test,	They found the variables under their study are I(1), one cointegration relation in trace test and no integration in lamda-max test. They found long term significant relationship among stock, money and forex market, no significant relation in the two sub-periods studied, reported positive relation between stock and treasury bills and exchange rates, unidirectional causality flows from treasury bills to stock and money

Authors/Study	Variables/Markets	Data Period	Methodology	Findings
				<p>supply and treasury bills and no casual relation between stock and both the money supply and stock exchange. In the VECM set up , causality flows from treasury bills , money supply and foreign exchange to stock market. There was no structural break.</p>
31.Machado et al,(2017)	Ibovespa and interest , exchange rate, long term economic activity, money supply and imports	January,1999 to Jun,2017	CUSUM-test Markov-Switching Model	The interest rate and exchange rate are positively related with the stock market and no significant relation between Ibovespa and inflation

Authors/Study	Variables/Markets	Data Period	Methodology	Findings
32. Yu and Liao (2017)	Stock, Money and Foreign Exchange market of China	Daily data from June, 2000 to December, 2016	VAR (7)-GARCH (1,1)-BEKK model	The results of the mean spill over test shows yields of foreign exchange market influences the stock price but stock price has no influence on foreign exchange market, and asymmetrical bidirectional mean spill over between stock and money and foreign exchange market. The results of the volatility spill over test show bidirectional spill over of the volatility from foreign exchange market to money market

Authors/Study	Variables/Markets	Data Period	Methodology	Findings
				and money market to foreign exchange market.
33.Gopinathan and Durai(2019)	BSE SENSEX, IIP,WPI,Broad Money, Indian Rupee-Dollar exchange Rate	04-1994 to07-2018	Engle-Granger,Phillips -Ouliaris(1990) and Johansn – Juselius(1990,1994) test cointegration and non-linear conitegration with ACE(Alternating Conditional Expectation) transformed data	Strong non-linear cointegration found between stock market and macro variablesincludi n the broad money.
34. Bernardelli and Castro, (2020)	Between Brazilian stock market and Selic ,that is , short run interest , exports, GDP, exchange as a percentage of GDP, index of Dow Jones.	January,2003 to March, 2019	Regression	They found Brazilian stock index, Ibovespa, GDP and exchange rate are I(0) but Dow Jones index are I(1) by ADF and PP test.They found negative

Authors/Study	Variables/Markets	Data Period	Methodology	Findings
				relation between stock market and exchange rates and short run interest, and, positive relation with GDP.
35. Shahoo and Satpathy(2020)	Inflation rate, interest rates, GDP, per capita GDP, SENSEX, Dow Jones indices of India and USA.	2015to2019, annual data	Correlation, regression, t-test and ANOVA test	All the macro variables in India and USA are significantly related
36.Gharana, Rahman and Islam (2021)	Interest rates(bond) Stock market, Money supply,Forex market (Yen/US Dollar)of Japan	September 1974 to February, 2017,monthly data	Toda-Yamamoto(1995) and Dolado-Lutkepohl(1996), multivariate Granger causality tests	They found bidirectional causality between IIP and stock market, Unidirectional between interest to stock market and stock market to money supply but no causality between stock and foreign exchange markets.

2.2. Research Gaps:

In essence, the literature illuminates that the issue of domestic integration is a debatable issue which must be settled on the basis of robust and objective investigation. The studies on Indian markets used, mostly, the monthly data to assess the activities and status of the very liquid market segments. Scholars argue that, instead of a strong long- term and stable view, the estimations based on the monthly data provide a short-run insight (Dimitrova, 2005) .The use of a variety of methodologies, incomplete searching ,absence of report on the presence of the variables in the co-integration space, lack of attestation of the Granger causality results by Innovation Accounting, following the rule of majority without reporting the unit root or stationarity test results, etc., and the fractured findings suggest that there is enough scope for further research to unveil the intricate relationship amongst the Indian call money, exchange and stock market. Findings of further studies might be helpful for policy planners in the overall monitoring and management of the liquidity in the economy.

2.3. Objectives of the Study:

In the new era, Indian financial markets appeared as the major player of the Indian financial system. In the free-regime, after initiating a good number of policy measures by the Indian authorities to integrate the segments of financial markets, especially the capital, money and foreign exchange market, the objectives of the study is simply to assess how far the segments are integrated. Very specifically, the objectives are:

- i) To assess the relationship amongst the capital, money and foreign exchange market ,
- ii) To assess the influence, if any , of the past values of the sample domestic markets on the future values of other markets under the study, and
- iii) To assess the future flexibility of the sample Indian domestic markets under the study.

2.4. Research Questions:

According to the objectives of the research the present study attempts to find the answer to the following questions:

- i) Is there any short-term or long-term stable relationship amongst the Indian capital, money and foreign exchange market ?
- ii) Do the past values of the Indian domestic markets, under the study, influence the future values of other markets?
- iii) Are the sample Indian domestic markets rigid, that is, can they explain or explained by other markets of this study?

2.5. Hypotheses:

Hypotheses of this study are:

- (A). H_0 : Indian domestic markets namely, stock, money and foreign exchange markets, are not integrated.
- (B) H_0 : Past values of none of the Indian domestic markets under the study influence the future values of other markets.
- (C) H_0 : All the sample domestic markets would remain rigid over the future period of time.

2.6. Methodology:

For the empirical methodology, this study would follow the statistical and econometric tools that are robust and widely used in the literature.

2.7. Data and Time Period:

Primary focus of the present study is to evaluate the nature of relation, if any, of the Indian major financial markets, like, Stock, Foreign and Money market. For this empirical investigation about the link amongst the markets, this study used secondary data collected from the official publications and websites of the Reserve Bank of India, Bombay Stock Exchange, etc. Precisely, the data used in the study are S&P BSE SENSEX 30 Indices (to represent capital market), Call money rates(CR) (to represent money market) and Rupee-Dollar nominal spot exchange rates (FX) (to represent foreign exchange market). In reviewing the literature, it is found that most of the earlier studies used the monthly data but the estimations based on the monthly data provide nothing but a short-run insight (Dimitrova, 2005). Hence, in this study used the high frequency data like the daily one at level. Although normal econometric practice is to take the first difference of the level data of the series but the problem in first differencing is that the technique imposes too many unit roots which virtually filters out the important information regarding long term relationship (see Eun and Shim 1989). Moreover, all the markets under our study are very sensitive and on a slightest hunch of instability in one market may lead to transfer of the funds to other markets including the overseas markets creating an overall problem in liquidity management in and across the markets in the economy.

Earlier researchers on market integration showed their positive preference for the period ranging from 5-10 years (Bhoi and Dhal,1998, Jena et al.,2004 Sanati ,2010, Bhattacharya and Mukherjee ,2003, Tavakoli and Dadashi ,2013, Lee and Zhao ,2014, Aamd and Dg ,2014, Odoyo. et al.,2014,). The reason behind is that any result based on longer horizon has little relevance in this type of finance research because of the degree of co-integration of financial markets changes over time (Karolyi and Scultz 1996,). Hence, this study also

investigated the link considering a time period of approximately 11 recent years ranging from 1st January, 2008 to 31st December, 2018 and used the daily data at log level.

2.8. Significance of the Research:

This empirical study is expected to be significant in providing an objective understanding of the inter-linkage amongst the Indian capital, money and foreign exchange market. Furthermore, it can be valuable in the hands of the policy planners and the Government in overall monitoring and management of the liquidity in the economy.

2.9. Plan of the Study:

The entire study is presented within five chapters below:

Chapter - 1: Introduction

Chapter – 2: Review of literature, Scope and Plan of study

Chapter–3: Methodology Used: A Brief Discussion

Chapter – 4: Cointegration of the Capital Market, Foreign Exchange Market and Money Market.

Chapter – 5: Summary of Findings, Limitations and Scope of Further Studies

2.10. Summary and Conclusion:

Till date, the literature on domestic financial integration is in its infancy. The studies so far surveyed illuminates that the issue of domestic integration is a debatable issue and the fractured findings suggest that there is enough scope for further research to unveil the intricate relationship amongst the Indian call money, exchange and stock market. The issue deserves serious attention of the researchers and must be settled on the basis of robust and objective investigation. The objectives of the study are : i) to assess the relationship amongst

the capital, money and foreign exchange market, ii) to assess the influence, if any, of the past values of the sample domestic markets on the future values of other markets under the study, and iii) to assess the future flexibility of the sample Indian domestic markets under the study. On the basis of the objectives, this study framed three hypotheses to attain the objectives. The hypotheses are: (i) Indian domestic markets namely, stock, money and foreign exchange markets, are not integrated, (ii) Past values of none of the Indian domestic markets under the study influence the future values of other markets, and (iii) All the sample domestic markets would remain rigid over the future period of time. Considering a time period of approximately 11 years ranging from 1st January, 2008 to 31st December, 2018, the daily data are collected for this study. The 1st chapter of this thesis introduces domestic integration, major steps taken by the government to converge stock, money and foreign exchange market and a brief theoretical relation amongst the markets under the study. Chapter 2, that is this chapter, outlines the objective, research questions and hypotheses along with the survey of literature. Empirical methodologies which are widely used and popular in the literature and used in this study are described in Chapter 3. Domestic integration and other hypotheses of the study are assessed by econometric tools in Chapter 4. The last chapter, i.e., Chapter 5 concludes the study with summary of findings, limitations and scope of further studies.

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