Rise and Fall of Interest Rate Futures in Indian Derivative Market

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Abstract

Interest rate derivatives are the most traded and widely accepted derivative instrument in the international derivative market. But this product is not popular in Indian derivative market. In 1999, the Over the Counter (OTC) interest rate derivative products were introduced and successful in terms of volumes. The Indian financial market introduced exchange traded interest rate derivatives in the year 2003, 2009 and 2014. While the product failed twice, in the third time (in 2014) the initial volumes are sharply declining in three exchanges viz. MCX-SX, NSE and BSE. In this backdrop, this study attempts to analyse the past, present and future of interest rate futures in Indian derivative market using the volumes, values and open interest of Interest rate derivatives for three exchanges.

Keywords: Derivatives, Interest Rate Futures, Exchange Traded Interest Rate Futures

1. Introduction

Equity derivatives, interest rate derivatives, commodity derivatives, foreign exchange derivatives, and credit derivatives are the derivative products available all over the world. From all types of derivatives, interest rate derivative is regarded as the most popular product and interest rate derivative market is the largest derivative market in World. Frankel (1984) mentioned interest rate futures as an innovation in financial techniques for the management of risk. Morris (1989) found greater volatility in the returns of bond create risk to the bond holders. Interest rate futures (IRFs) help the investors to protect their bond return by providing a hedge against interest rate changes.

There are two ways to trade these derivative products, one is through Over the Counter (OTC) derivative market and another is through recognised stock exchanges. Based on the trading strategy, there are two interest rate futures, one is OTC IRFs and another one is Exchange traded IRFs (ETIRFs). The Eurodollar future is the most popular interest rate derivative product in the world well traded in the Chicago Mercantile Exchange (CME) since 1981 (Chokhani, 2010)[1]. IRF is an agreement to buy or sell an underlying debt security at a fixed price on a fixed day in the future. The borrower paid the interest rate to the lender on borrowed cash as a compensation for forgoing the opportunity of earning income from other investments that could have been made with the loaned cash. IRF is a cash contract between a buyer and a seller agreeing to the future delivery of any interest bearing asset such as Govt. bonds. The participants who are looking for benefit from interest rate movements may attract towards interest rate futures. The purposes of the participants to use IRFs are presented in Table 1.

The OTC derivative products were successful in Indian market (which was introduced in 1999)[2]. But India failed two times in introducing exchange traded interest rate derivatives in 2003 and 2009. This is the third time IRFs are allowed to trade in exchanges from January 2014. The interest rate future is a popular derivative product in international market, still India is not able to introduce this product effectively. Gyntelberg and Upper (2013) studied the international OTC (Over the Counter) interest rate

1 The region wise volumes (contracts turnover) on organised stock exchanges presented in Table-4 and total notional principal (in billions of US Dollar) presented in Table-5 of appendix.

2 The OTC interest rate derivative market in India is well regulated by RBI. Two OTC derivative products like interest rate swaps (IRS) and forward rate agreements (FRAs) are available in India. Because of this, the share of Indian OTC derivative market in world OTC derivative market is very small. This study presents the past and present of IRFs in India and World.

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Table 1: Participants of IRFs and their Purpose

Banks	*Primary Dealers*	*FIIs*	*Mutual Funds*	*Insurance Companies*	*Corporate*	*NBFCs*	*Proprietary Traders*	*Retail/HNI*
Hedging	Hedging	Hedging	Hedging	Hedging	Hedging of assets	Hedging	Intra-day trading	Hedging
Arbitrage	Arbitrage	Arbitrage				Arbitrage	Arbitrage	
View based	View based	View based			Hedging of liabilities	View based	View based	View based
Duration based	Duration based	Duration based	Changing duration of portfo-lio	Changing duration of portfolio	View based	Duration based		
Long hedged	Long hedged	Calendar spread		Locking of yield		Calendar spread	Calendar spread	Locking of yield
Calendar spread	Calendar spread							

Notes: HNI-High Net Worth Individuals, FIIs-Foreign Institutional Investors

Sources: BSE and NSE[1]

1 http://www.bseindia.com/downloads1/IRFEBrochure.pdf and http://www.nseindia.com/products/content/derivatives/irf/IRF_Brochure_new.pdf

derivative market in 2013. The actively traded interest rate derivatives in World are swaps and forward rate agreements (FRAs). As per this study, the daily turnover in the IRFs market in April 2013 was 14% higher than three years before. In the OTC interest rate segment, interest rate swaps are mostly traded (60% in 2013) followed by forward rate agreements (FRAs) (32% in 2013) and interest rate options (7% in 2013). Authors found, the turnover in the Euro interest rate is almost doubled where as turnover in yen, US dollar and Canadian dollars were noticeably declined. This study presents the past, present and future of IRFs in India and World.

The rest of the paper is organised as follows. The second section focuses on the background of the study followed by success and failures of the Interest Rate Futures in India in the third section, conclusion in the fourth section, and reference in the last section.

2. Background of the Study

2.1. Global Scenario on IRFs

Long term (10 years and above) and short term (up to one year) are two types of interest rate futures globally available. The long term futures are known as long bond futures and short term futures are called treasury bill futures and reference rate futures. The long term bond futures markets in worldwide are both physically settled and cash settled. For example- the futures on the 10 years municipal bond index of Chicago Board of Trade (CBOT) is cash settled. The short term futures like T-Bill futures are physically settled where as the futures on reference rates like London Inter-Bank Offer Rates (LIBOR) are cash settled (Bansal, BSE)[3].

Since 1960s the commodity futures have been trading on organised stock exchanges of the United States. Chicago Board of Trade (CBOT) based on Ginnie Mae (Government National Mortgage Association-GNMA) mortgages starts the World's first interest rate futures (IRF) contract in 1975. This contract was initially success but later on it failed (in December 1984, this product stopped trading). CBOT was first introduced the 30 years Treasury bond futures in 1977. This product was successful with highest volume of contract.[4] At present 2 years, 5 years, 10 years Treasury note and 30 years "Ultra" Treasury bond futures are available in Chicago Mercantile Exchange (CME) group.[5] The Eurodollar futures contracts are most widely traded in the world

3 Available at- http://www.bseindia.com/downloads/InterestRateFutures.pdf

4 Available at:- http://husky1.stmarys.ca/~gye/derivativeshistory.pdf

5 On July 12, 2007, CBOT holdings Inc. and Chicago Mercantile Exchange Holdings inc. merged to create CME group.

through Chicago Mercantile Exchange (CME) which are cash settled in nature. Each CME Eurodollar futures contract bears a face value of $ 1,000,000. This product was first launched on 9th December 1981. Now the three month Eurodollar futures offer greater liquidity and lower transaction costs. The price of this instrument is 100 minus the implied interest rate. A price of 95.00 means an interest rate of 5.0% and a price of 93.00 means an interest rate of 7.0%. The major international exchanges involved in the interest rate derivatives are Australian Securities Exchange, BM&FBOVESPA, CME group, EUREX, Intercontinental Exchange, NYSE Euronext, Nasdaq Omx, Singapore Exchange, Tokyo Stock Exchange, and South African Futures Exchange-JSE etc.

2.2. IRFs in Indian Scenario

Sovereign (Government) debt market and corporate debt markets are two types of debt markets exist in India. Government bonds are more popular than the corporate bonds because the chance of default is very limited. Interest rates futures are widely used in more developed market. To get the benefits out of IRFs, RBI introduced OTC interest rate derivatives in 1999. Two OTC IRFs introduced in 1999 were interest rate swaps (IRS) and forward rate agreements (FRA). Exchange traded IRFs were introduced in 2003, 2009 and 2014. Interest rate derivatives in India are presented in Table 5 of Appendix. This product failed in 2003 and 2009. Recently India introduced IRFs on 10 year Government of India bonds. Yet it is to see whether it will get popular in the market or fail in Indian market as earlier. The volume of OTC derivative trading was successful in India. The transaction of FRAs/IRS increased from about 200 contracts with total amount of Rs. 4,000 crore on March 2000 to 6,500 contracts with total amount of Rs.1, 50,000 crore in December 2002. But there are some shortcomings of this product like information asymmetries and lack of transparency and its connection in major institutions for which IRS and FRA may not fully hedge the interest rate risk.

2.3. Exchange Traded IRFs 2003

To overcome the drawbacks of the OTC interest rate futures, Securities and Exchange Board of India (SEBI) with Reserve Bank of India (RBI) and Fixed Income Money Market and Derivative Association of India (FIMMDA) introduced exchange traded IRFs on 2003. The RBI has formed a committee under the chairmanship of Jaspal Bindra, CEO, Standard Chartered Bank. The committee recommended the idea of introducing the exchange traded derivatives. Based on this report, Futures on 10 year zero coupon Govt. of India security was allowed to trade from 2003.

The features of the Exchange-traded derivative market have been given in Table 2.

Table 2: Features of Exchange Traded Derivatives

i.	An electronic exchange mechanism and emphasizes anonymous trading
ii.	Full transparency
iii.	Use of computers for order matching
iv.	Centralisation of order flow
v.	Price-time priority for order matching
vi.	Large investor base
vii.	Wide geographical access
viii.	Lower costs of intermediation
ix.	Settlement guarantee
x.	Better risk management
xi.	Enhanced regulatory discipline

Source: www.rbi.org

2.4. Features of IRFs introduced on 2003

Features of the IRFs introduced on 2003 are as follows:

Table 3: Features of IRFs 2003

i.	The delivery of the contract shall be on cash settlement.
ii.	The contract has to be priced on the basis of the average 'Yield to Maturity' (YTM) of a basket comprising at least three most liquid bonds with maturity between 9 and 11 years.
iii.	The quotation and trading price of the futures contract has to be as 100 minus the YTM of the basket.
iv.	In the event that bonds comprising the basket become illiquid during the life of the contract, reconstitution of the basket shall be attempted, falling which the YTM of the basket shall be determined from the YTMs of the remaining bonds.

Source: www.rbi.org and www.nseindia.com

The daily settlement price for unexpired futures contracts shall be the futures prices computed using the (price of the notional bond) spot prices arrived at from the applicable ZCYC (Zero Coupon Yield Curve). The ZCYC shall be computed by the exchange or any other agency.

But this instrument failed due to the following reasons.

i. Common traders were not able to understand Cash settled on a ZCYC basis.

ii. Banks were prohibited in taking positions in these contracts.

Source: www.rbi.org and www.nseindia.com

2.4. Exchange Traded IRFs 2009

In February 2008, RBI and SEBI constituted a committee on the chairmanship of Mr. V. K Sharma to look into the matter. The joint committee recommended –

i. Banks would be allowed to take trading positions in the interest rate futures.

ii. The short selling intervals co-terminus with the future contracts.

2.5. Features of Interest Rate Futures introduced in 2009

Standardised Interest Rate Futures contract has the following features:

Table 4: Features of IRFs 2009

i.	The contract shall be on 10-year notional coupon bearing Government of India security.
ii.	The notional coupon shall be 7% per annum with semi-annual compounding.
iii.	The contract shall be settled by physical delivery of deliverable grade securities using the electronic book entry system of the existing Depositories, namely - National Securities Depositories Ltd. and Central Depository Services (India) Ltd. and Public Debt Office of the Reserve Bank.
iv.	Deliverable grade securities shall comprise Govt. of India securities maturing at least 7.5 years but not more than 15 years from the first day of the delivery month with a minimum total outstanding stock of Rs 10,000 crore.

Source: www.rbi.org

On 7th August 2009, BSE and NSE introduced interest rate derivatives. But this also failed in the market. The causes of failure of IRFs in 2009 are as follows-

i. Short selling was not allowed beyond 5 days.

ii. Due to physically settlement and illiquid in the underlying bond, the bank participation was low.

iii. Banks were more attracted by OTC market rather than exchange platform.

Source: www.rbi.org

2.6. Exchange Traded IRFs 2014

In January 2014, RBI Governor, Raghuram Rajan introduced 3rd time exchange traded IRFs in India with cash settlement basis. The exchanges like Bombay Stock Exchange (BSE)[6], National Stock Exchange (NSE)[7] and Multi Commodity Exchange Stock Exchange Limited (MCX-SX)[8] are allowed to trade. Initially serial monthly contracts with a maximum maturity of three months would be available. As per SEBI, the IRF will be introduced on a pilot basis and the features of the products will be reviewed based on the experience gained. This particular product will be traded from 9 am to 5 pm. from Monday to Friday[9]. As per the SEBI circular on 5th December 2013, two different designs of 10 years GOI security are allowed, that are –

Option A: Coupon bearing Govt. of India security as underlying, and

Option B: Coupon bearing notional 10 years Govt. of India security with settlement price based on basket of securities as underlying. Exchanges are allowed to launch either one or two of these options.

2.7. Features of the Product (IRFs 2014)

Underlying: Option A: GOI security of face value Rs.100 with semiannual coupon and residual maturity between 9 and 10 years on the day of expiry of IRF contract, as decided by stock exchanges in consultation with FIMMDA (Fixed Income Money Market and Derivatives

6 BSE on Interest rate futures at: http://www.bseindia.com/downloads1/IRFEBrochure.pdf

7 NSE on interest rate futures at: http://www.nseindia.com/products/content/derivatives/irf/IRF_Brochure_new.pdf

8 MCX-SX on interest rate futures at: http://www.mcx-sx.com/downloads/Circulars/CircularDownloads/Circular_(1703)_Launch_of_Interest_Rate_Futures.pdf

9 On October 29, 2013, RBI mentioned in its 2nd quarter review of monetary policy 2013-14 to allow IRFs in Indian market. On December 5th 2013, RBI and SEBI released circular for introducing this product.

Association)

Option B: Notional coupon bearing 10 years GOI security with a notional coupon paid semiannually and face value of Rs.100 for each contract there shall be basket of Govt. of India securities with residual maturity between 9 and 11 years on the day of expiry of IRF contract with appropriate weight assigned to each security in the basket.

Size of the contract: Each future contracts shall represent 2000 underlying bonds of total face value of Rs.2, 00,000/.[10]

Quotation: Quotation shall be similar to the quoted price of the Govt. of India security.

The tenure of the contract is now serial monthly with maximum of 3 months maturity.

The contract value shall be = Quoted price * 2000.

The daily contract settlement value shall be = P_w*2000

P_w = volume weighted average futures price of the last half an hour.

Final contract settlement value:

Final contract settlement value shall be = 2000*P_f

P_f is the final settlement price of the underlying/notional bond which shall be determined as given below-

Option A: P_f is the weighted average price of the underlying bond based on the prices during the last two hours of the trading on NDS-OM (Negotiated dealing system – Order matching). If less than 5 trades are executed in the underlying bond during the last two hours of trading, then FIMMDA price shall be used for final settlement. (Source: www.rbi.org)

Option B: The final settlement price shall be based on average settlement yield (Y_S) which shall be the weighted average of the yields of bonds in the underlying basket. Y_S will be rounded off to 4 decimal digits. For each bond in the basket yield shall be calculated by determining weighted average yield of the bond based on last two hours of the trading in NDS-OM. If less than 5 trades are executed in the bond during the last two hours of trading, then FIMMDA price shall be used for determining the yields of individual bonds in the basket.

$$P_f = \left[\frac{100}{(1+\frac{Y_S}{2})^{20}}\right] + \left[\sum_{k=1}^{20} \frac{100*\frac{C}{2}}{(1+\frac{Y_s}{2})^k}\right]$$

Pf = the final settlement price of the underlying or notional bond.

Y_S= Settlement yield

C= the notional coupon of underlying bond.

K= the time period

Source: www.sebi.gov.in

Banks are permitted to participate in the IRFs for the purpose of hedging the risk in the underlying portfolio and also take trading position. However, banks are not allowed to undertake transactions in IRFs on behalf of clients. Primary dealers are allowed to deal in IRF for both hedging and trading on own account and not on clients account. This criterion is same as the 2009 criteria. Brokerage house, insurance companies, primary dealers, mutual funds, provident and pension funds, corporate houses, retail individuals, FIIs are also allowed to take a position on IRFs. The Exchanges offer 10 years Govt. of India Bond in two maturity dates comprising two products. First one is 7.16% GOI security maturing on 20th May 2023 and second one is 8.83% GOI security maturing on 25th Nov. 2023[11]. The details of the products, exchanges, participants and trading hour are presented in Table 5 of Appendix.

3. Success And Failure of the Interest Rate Futures In India

RBI allowed trading on exchange traded Interest rate futures on 10 years Govt. of India Bonds in 2003. At that time only NSE had launched this product. There was restriction for the banks to trade on this derivative product and the calculation of all the futures rate was on the basis of ZCYC which was not understood by common traders. For these causes the IRF of 2003 failed in the Indian market. In 2009, again Indian financial market introduced the IRF of 10 years Govt. of India Bonds on physically

10 Exchange Traded Cash Settled Interest Rate Futures (IRF) on 10 year Government of India Security, SEBI Circular on 5th December 2013

11 The IRFs on 2014 first launched by (MCX-SX) on 20th January 2014 followed by NSE on 21st January and BSE on 28th January 2014.

settled basis keeping the fact that the interest rate futures are occupying the major role in the international derivative market. On 2009, RBI allowed the banks to trade on this product but there was a liquidity problem, since the settlement was on physical basis. That's why the 2009, IRFs failed in Indian market. Financial experts indicated the cause of failure was because of the faulty design of the product. Time to time RBI constituted several committees for reforming the introduction of interest rate futures and to get benefit out of that. Still not a single time this product was successful. In January 2014, RBI and SEBI permitted the same product with cash settlement basis and allowed NSE, BSE and MCX-SX to introduce for trading on exchanges. The media named this product as 'Rajan's Baby'. It is another question whether this product will gain in Indian market or will fail like 2003 and 2009. The Rajan's Baby will be an efficient youth or inefficient youth and will follow the past psychology of the investors or will change the sentiment of the investors is yet to be seen on this innovative product. The cash settled IRF of 2014 may attract the investors to trade. The detailed of the success and failure of IRFs in India is presented in the Table 6 of Appendix.

3.1. Present Moments of IRFs in India

The existence of an innovative financial instrument like IRFs is in doubt for Indian derivative market. From the first day of trading to till date the volume as well as total value reduced sharply.[12] The change in volumes, values and open interest of all the three exchanges are given below.

Volumes: Figure 1 (in Appendix) presents volumes/ no. of contracts traded in three exchanges like MCX-SX, BSE and NSE. The first day volume of all exchanges was so high but after three days in case of MCX-SX it came down from 45,642 to 17,341 number of contracts, after one day in case of BSE it came down from 23,294 to 9,329 number of contracts and in case of NSE it came down from 1, 51,134 number of contracts to 61,768 number of contracts after one day. The overall period's volumes in three exchanges came down drastically. BSE came down to almost zero (AS on 24th March 2014 it has traded only 7 contracts), NSE came down to 19,687 no of contracts as on 21st March 2014 and MCX-SX came down to 872 no of contracts as on 25th March 2014. In the last week of March (24th- 28th March 2014), volumes in the BSE and NSE and MCX-SX are increasing but on the last day (28th march 2014) it again started falling.

We calculate the total number of contracts of all the three exchanges and consider the percentage share of each exchange to total no of contracts traded on daily basis. This is presented in Figure 2 (in Appendix). Total no. of contracts traded over the period of time in all the three exchanges is 1,987,252 out of which NSE shares almost volumes (77%), then MCX-SX (17%) and less volumes are traded in BSE (6%). This indicates that IRFs are doing well in NSE then that of other two exchanges.

Values/Turnover: The total value/ turnover of all the three exchanges over the period of time are presented in Figure 3 (in appendix). On the first day of trading MCX-SX has 928.39 Crores, BSE has 467.86 Crores and NSE has 3081.5 Crores. This turnover came down day by day to almost zero in case of BSE (0.72 Cr. on 20th March, 0.9 Cr. on 21st March and 0.14 Cr. on 24th March 2014) and MCX-SX (22.19 Cr. On 21st and 17.4 Cr on 25th March 2014). Over the period of time NSE crossed 1,000 Cr. volumes only in 4 days.[13] But it never touched or came to nearer to the first day volume (i.e. 3,081.5 Crore). Overall turnover in NSE is more as compared to MCX-SX and BSE.

Figure 4 (in Appendix) presents the percentage turn over in three exchanges over the period of time. First we calculate total turnover of three exchanges and percentage turn over in each exchange wise. Over the period NSE covers 77%, MCX-SX covers 17% and BSE covers 6% of total turnover.

Open Interest: Figure 5 (in Appendix) presents the open interest (number of contracts outstanding) in three exchanges. The open interest is more in case of NSE over the period of time. The open interest at BSE is very less followed by MCX-SX.

We calculate total open interest of all the three exchanges and percentage of open interest in each exchange wise on

12 We use daily data based on the volume and total value of interest rate derivatives traded in 3 exchanges. We take data from 20th Jan. 2014 to 28th March 2014 with total of 47 observations for MCX-SX, from 21st Jan. 2014 to 28th March 2014 with total of 46 observations for NSE and 28th Jan. 2014 to 28th March 2014 for BSE with total of 40 observations.

13 Volumes on the NSE as on 22nd January 2014 is 1250.95 Crores, 25th February 2014 is 1035.63 Crores, 26th March 2014 is 1,418.92 Crores and as on 27th March 2014 it is 1, 785.47 Crores.

daily basis. This is presented in Figure 6 (in Appendix). Over the period the open interest is 53,864 out of which NSE covers 77%, MCX-SX covers 21% and BSE covers 2%. It is clear that open interest in BSE is very less and in NSE it is so high.

Here question arises when the international derivative markets are able to trade efficiently and effectively on IRFs, why India fails time to time? This may require forming a committee to review on the matter which can help IRFs to become a popular instrument in Indian derivative market.

4. Conclusion

A new product always faces problems in its existence. This time the fear of failure (as it failed in 2003 and 2009) may create problem on trading in this innovative product in Indian market. But by the passage of time it may touch the heart of the investors and grow in Indian derivative market. When global IRFs market is doing well, why not India? The 2014 IRF becomes simpler as compared to earlier because there is no ZCYC norm, banks are allowed to trade in this product and the products are cash settled. This time the RBI Governor Dr. Raghuram Rajan is directly interfering in this matter. The problem of IRFs in Indian derivative market has to be re-examined by the regulatory authority. The so called Rajan's Baby is going sick day by day. It needs strong interference of the regulatory authority to cure the sickness associated with the IRFs.

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Appendix

Table 5: Interest Rate Derivatives In India

Year	Products	Stock Exchanges	Participants	Trading Hour
1999	FRA	These are purely OTC instruments and are not allowed to trade in Exchanges.	Scheduled Commercial Banks (Excluding Regional Rural Banks), Primary Dealers (PDs) and all Indian Financial Institutions (FIs)	--------
	IRS			
June 2003	10 year Govt. of India Bonds	NSE	Primary Dealers (PDs). Banks are Barred from holding trading position in IRF	9 am to 5 pm Monday to Friday
August 2009	10 year Govt. of India Bonds	NSE and BSE	All Scheduled Commercial Banks, Primary dealers, Urban co-operative banks, Non-banking Finance Companies and specified All India Financial Institutions	9 am to 5 pm Monday to Friday
January 2014	10 year Govt. of India Bond	NSE, BSE and MCX-SX	Banks, Insurance companies, Brokerage House, Primary Dealers, Mutual funds, Provident and pension funds, Corporate Houses, Retail individuals and FIIs.	9 am to 5 pm from Monday to Friday

Notes: FRA- Forward Rate Agreement, IRS- Interest Rate Swaps, IRF-Interest Rate Futures

Table 6: Success or Failure of Interest Rate Futures (IRFs) in India

Year	*Product*	*Nature of Settlement*	*Nature of the Product*	*Failure/Success*	*Changes Required*
1999	FRA and IRS	Cash Settled	OTC Derivative	Successfully worked. Still Exchange traded derivative required for maintaining transparency and hedging interest rate risk accordingly.	Due to the dynamic nature of gross credit exposures and information asymmetries and lack of transparency of this product, it is not able to hedge the risk Efficiently. Thus exchange traded derivative requires to introduce to reduce the risk through a clearing corporation, novation, multilateral netting, centralised settlement and risk management
2003	10 year Govt. of India Bonds	Cash Settled	Exchange Traded Derivative	Failed due to Cash settled on a ZCYC and Banks were not allowed to take a trading position on this instrument and short selling was not allowed.	Need of Banks participation, modification of ZCYC and short selling requires to allow.
2009	10 year Govt. of India Bonds	Physically Settled	Exchange Traded Derivative	Failed due to illiquidity on the Physically settled system, Short selling was not allowed beyond 5 days. For these causes, Banks participated more on the OTC market.	Cash settlement requires on this product, short selling need to allow for more than 5 days. More measures require maintaining liquidity in this particular product.

Year	*Product*	*Nature of Settlement*	*Nature of the Product*	*Failure/Success*	*Changes Required*
2014	10 year Govt. of India Bonds	Cash Settled	Exchange Traded Derivative	Yet to see how it is working. MCX-SX is going to introduce on 20th; NSE on 21st and BSE on 28th of January 2014.	---

Table 7: Interest rate Futures traded in organised exchanges (No of Contracts Turnover in Millions)

Markets	*2010*	*2011*	*2012*	*Q4 2012*	*Q1 2013*	*Q2 2013*	*Q3 2013*
All Markets	2,546.1	2,840.5	2,399.6	538.1	697.4	826.9	664.2
North America	1,77.9	1,344.2	1,070.0	230.3	297.7	372.5	305.1
Europe	931.3	985.6	780.2	172.5	253.2	251.1	218.0
Asia and Pacific	119.2	141.2	147.2	35.1	40.4	48.6	38.9
Other Markets	317.8	369.6	402.2	100.3	106.1	154.8	102.3

Sources: BIS Quarterly Review, December 2013, June 2012

Table 8: Interest rate Futures traded in organised exchanges (Notional principal in billions of US dollar)

Markets	*2010*	*2011*	*2012*	*Q4 2012*	*Q1 2013*	*Q2 2013*	*Q3 2013*
All Markets	1,235,907.4	1,359,130.6	1,026,135.4	226,458.6	312,537.9	350,564.8	300,647.5
North America	658,193.5	740,210.8	553,546.2	116,169.4	143,769.6	188,097.5	161,208.4
Europe	498,836.1	525,662.3	387,886.6	89,882.8	145,344.1	134,775.2	119,263.6
Asia and Pacific	60,899.6	71,504.0	64,084.9	15,501.0	18,103.9	20,181.1	15,575.4
Other Markets	17,978.1	21,723.5	20,617.7	4,905.3	5,320.2	7,511.0	4,600.1

Sources: BIS Quarterly Review, December 2013, June 2012

Figure 1: Volumes/ No. of Contracts Traded

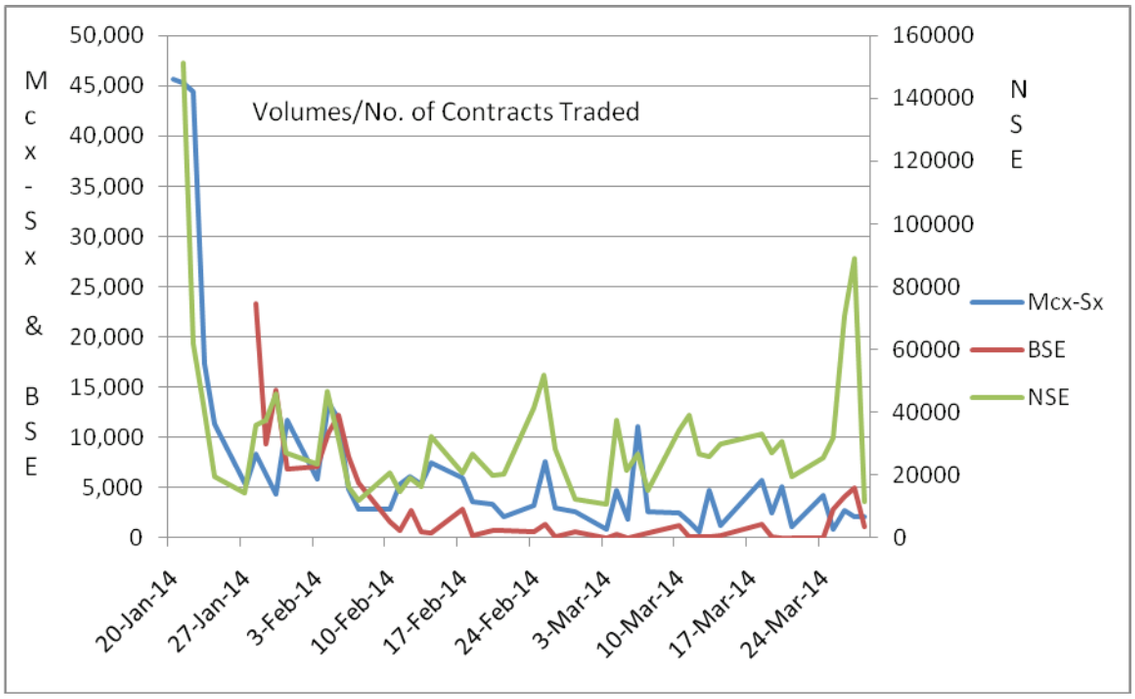

Figure 2: Percentage Volumes to Total Volumes

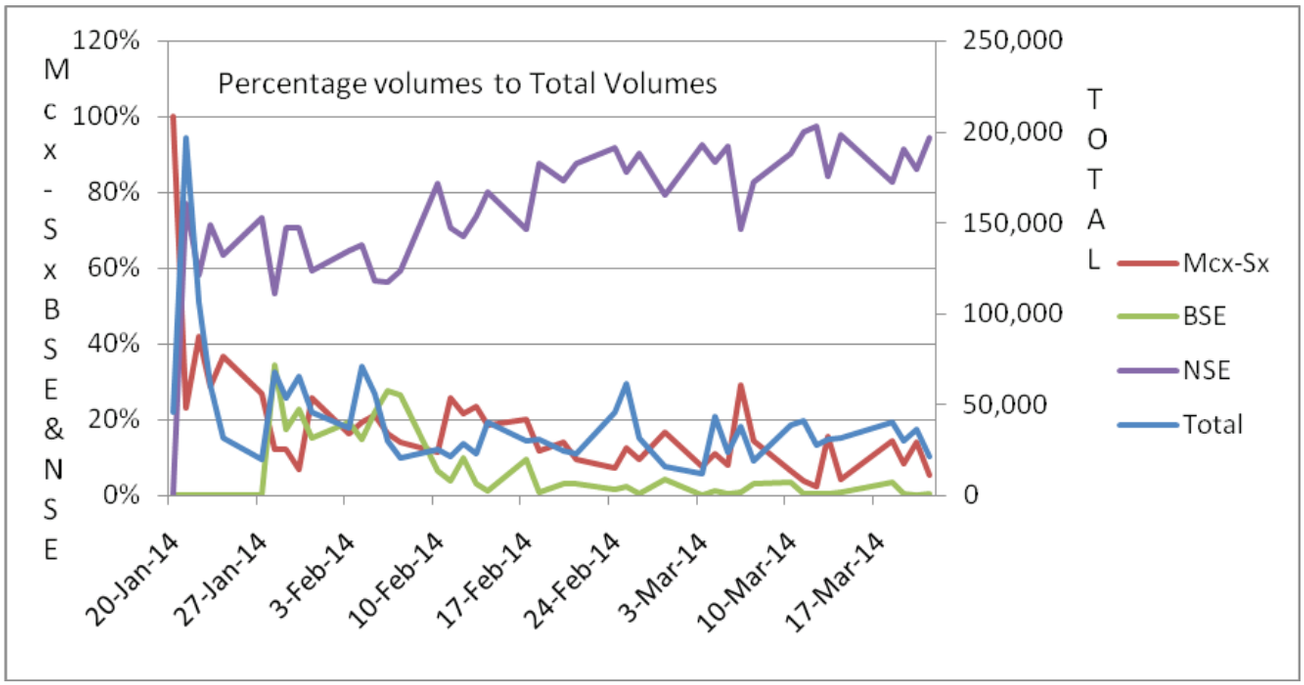

Figure 3: Total value/ turnover of all the three exchanges

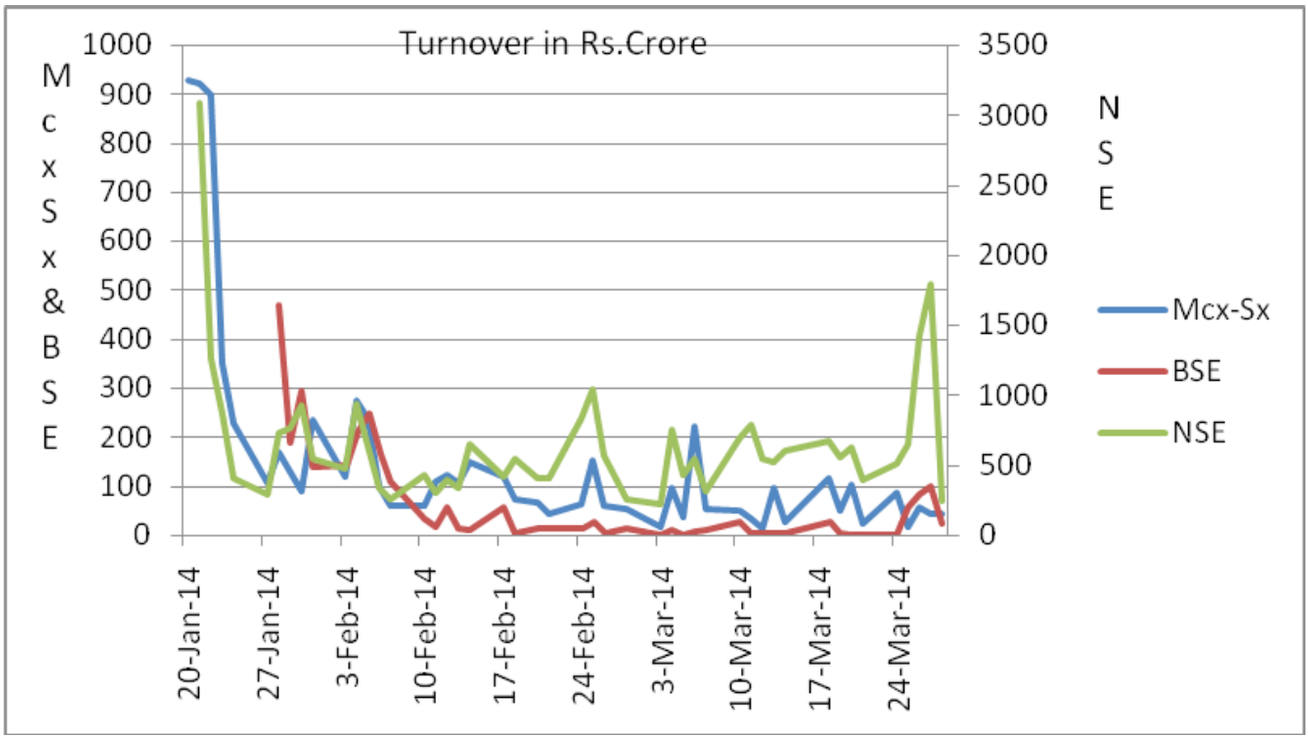

Figure 4: Percentage turnover in three exchanges

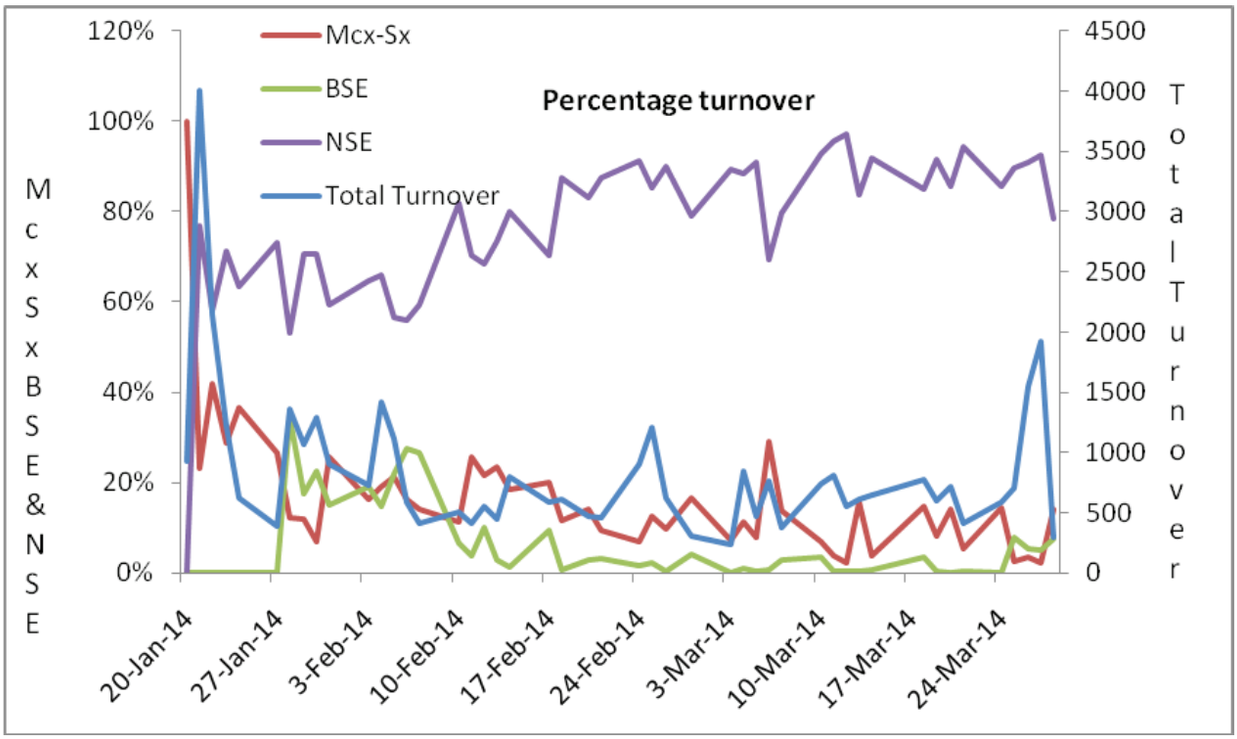

Figure 5: Open interest (number of contracts outstanding)

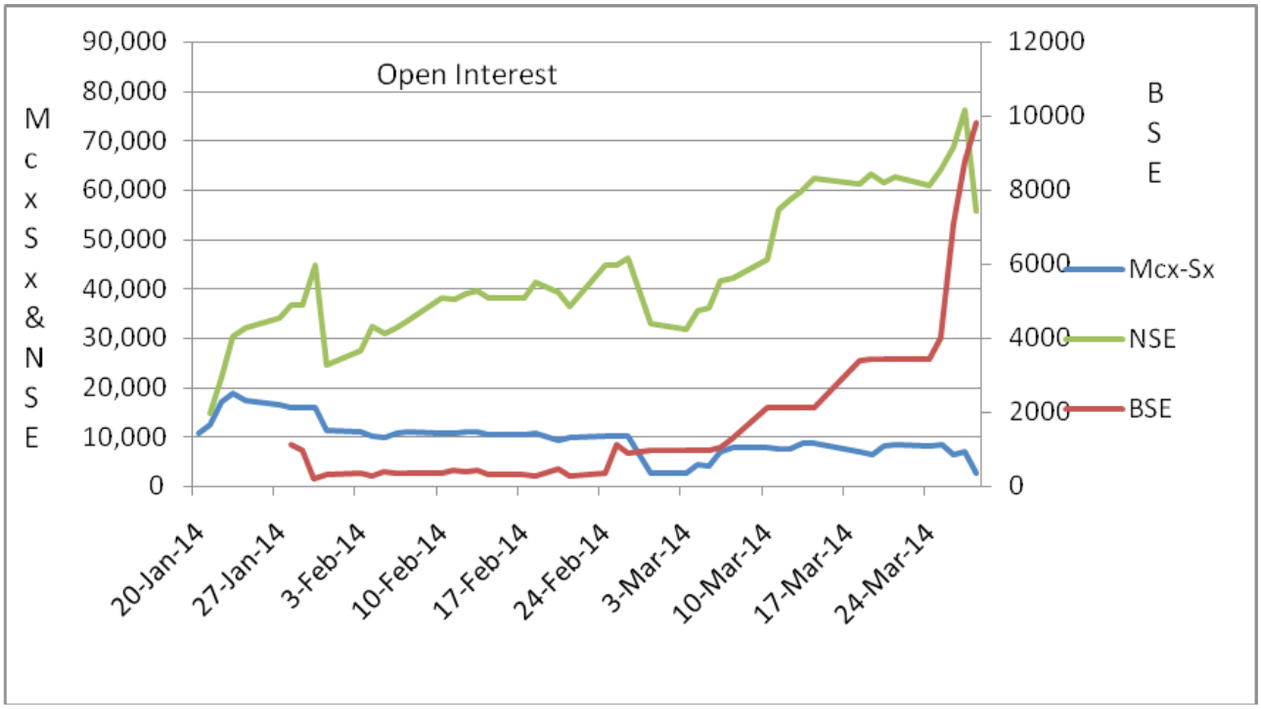

Figure 6: Percentage of Open Interest