INTEREST RATE FUTURES : CONCEPT AND INTRODUCTION IN INDIA

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One of the most important financial sector innovation of the Last quarter of the 20th Century has been interest rate futures contracts. The Indian market is becoming increasingly active in the area of OTC traded interest rate drvatives like interest rate swops (IRS) & forward rate agreements (FRAs). The amounts covered under such agreements have risen tremendously during the recent past. The report of the RBI's Weeking Group on Rupee Derivatives, has recommended the introduction of interest rate futures (IRF) i.e. a form of exchange-traded interest rate derivatives (ETIRD) to supplement already existing OTC-derivatives. The Group has opined that, in India, in the absence of ETIRD the risk of OTC derivatives market can not be hedged effectively.

INTRODUCTION

Simply, a futures contract means a contract in which prices and conditions are fixed now for a transaction that will take place in the future. In case of an interest rate futures (IRF) the 'transaction' is a national fixed-term deposit and the 'price' is the fixed rate of interest that will apply during the term of deposit, which covers a particular period in the future. So, buying an IRF contact is equivalent to making a deposit while selling on IRF contract is equivalent to borrowing or taking a deposit. In other words, IRF is a derivative product for the fixed income market, which enables participants to protect their positions in the cash market from adverse movements in interest rates. So, if a trader has a position in G-Securities and sees interest rates rising in the near-term, he would sell futures. He will buy futures contracts, if he sees rates falling.

a)	Selling (short) an interest rate futures (IRF) contract protects against a rise in interest rate.
b)	Buying (long) an IRF contract protects against a fall in interest rates.

An interest rate futures contract is a future contract on an asset whose price is dependent solely on the level of interest rates. Hedging a company's exposure to interest rates is more complicated than hedging its exposure

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to the price of a commodity. This is because a whole the term structure is necessary to provide a full discription of level of interest rates, whereas the price of commodity can be described by a single number. A company, when wishing to hedge its interest rate exposure, must decide not only the maturity of the hedge it requires but also the maturity of interest rate to which it is exposed. It must then find a way of using available IRF contracts so that an appropriate hedge is obtained.

Interest rate futures contracts, like other futures contract perform two important economic functions. First, they provide a means of hedging the interest rate risk of potential borrowers and lenders. For the purpose of hedging interest rate risk, a futures position opposite to the cash market position is established. For example if the cash market position loses from a rise in interest rates the futures position taken is one that will profit from a rise in interest rates.

Secondly, they serve a very useful role in the price discovery process relating to the future cash market interest rates. By studying and analysing the information contained in the futures contracts pertaining to bonds or treasury bills, market players can estimate the expected future cash market prices for these instruments and thereby they can derive the likely future levels of interest rates for various durations. For examples the traded price for a 3-month treasury bills contracts would basically reflect the interest rates that are expected to prevail three months hence for the treasury bills. In a way the market players are trying to predict the future interest rates and they are willing to add full value to their predictions by committing their funds in the form of margins paid to the clearing corporation of the exchange that guarantees settlement of the futures contract.

Trading Mechanism of an IRF contract :

To describe the mechanism, how an IRF contract works, the example of a 3-month sterling contract on LIFFE (London International Financial Futures Exchange) has been taken. The contract is defined as follows :

Unit of Trading	£5,00,000
Delivery Months	March, June, September, December
Delivery date	First business day after the last trading day
Last trading day	11.00 a.m., Third Wednesday of delivery month.
Quotation	(100 – rate of interest)
Minimum price movement	.01%
Tick value	£12.50
Trading hours	08:05-16:02 (trading pit)
	16:27-17:57 (APT Screen trading)

The main features of the contact can be explained under the following heads :

Unit of trading : Each contract covers a sterling deposit having a fixed size of £5,00,000 and this defines the unit of trading. It is possible to buy or sell any whole number of contracts, but this restricts the size of deals to a multiple of £5,00,000 as contracts are not divisible.

Trading, delivery and settlement : All futures contracts follow a rigid calendar with predefined delivery dates, usually four per year in March, June, September and December. (Nearly all financial futures are designed to have these dates falling in March, June, september & December). The delivery months, delivery date and last trading day together define exactly when these delivery dates occur. For instance, the March 1966 contract will cease trading at 11.00 a.m. on Wednesday 20th March and final cash settlement will take place the following day.

Futures contracts originally (when confined to commodity) involved the physical delivery of the underlying asset but, cash settlement is usually exercised in case of financial futures contracts where the underlying securities are not always tangible and the objective of the contract is also not physical delivery but hedging or speculation mainly. Nonetheless, the term delivery is still used to denote the date and time when contracts expire.

Quotation : The original designers of interest rate futures decided that these contracts would be traded on an indexed 'price' rather than the interest rate itself where the price is defined as :

$$P = 100 - i$$

Where

P = Price Index

i = Future interest rate in per cent

This is because of the following reason. An IRF contract is defined as a fixed rate deposit and a speculator would wish to borrow funds (sell futures) at a low interest rate and deposit funds (buy futures) at a high interest rate. This implies a 'buy high, sell low' strategy which is unnatural. To follow the correct strategy of 'buy low and sell high', indexed prices are quoted rather than the interest rates as this system of quotation simply reverses the behaviour of futures price when interest rate changes. That means, the prices rise when interest rate falls and the prices fall when interest rate rises.

So, the important thing to note is that the futures price for IRF contracts is not a price in the usual sense like a price of £84 or Rs. 84 or any other monetary

amount. Rather, it is just an alternative representation for the interest rate at which the underlying notional deposit or loan could be executed. It is a token for the general level of interest rates. The futures price in therefore, more similar to a stock index, which indicates the general level of the stock market rather than the actual price of any particular share or group of shares.

Minimum price movements & tick value : All the contracts specify minimum price movement or tick, that is, the smallest difference between two consecutive price quotations. The tick value is the change in the value of a contract when there is minimum price movement. So, given the minimum price movement of .01% with a trading unit of £5,00,000 will result in a tick value of £12.50 for a 3-month contract period as shown below :

.01% × £5,00,000 × 3/12=£12.50

The short-term interest rate futures contracts in other countries are all defined in exactly the same manner, differing only in the unit of trading and in technical details like trading hours.

Hedging with IRF

The basic principle of hedging with financial futures is that a futures position should be taken so that the feared interest rate change causes a profit on futures that compensates for the loss incurred on the assets and liabilities. Three month treasury bills futures contracts are notional commitments to borrow or lend for 3 months on specified future dates at interest rates agreed upon at the time of undertaking the contracts.

Both potential lenders and potential borrowers might find hedging desirable. Consider, for example, a company that anticipates receipts of Rs. 100,00,000 two months hence and intends to lend this money. The company's CFO might expect interest rates to fall over the next 2 months and would like a means of reducing the impact of that fall. Alternatively, he may simply want to avoid the risk of interest rates falling. Either way he wants to hedge, i.e., insure himself, against the possibility of a fall in interest rates. On the other hand, a cFo, who intends to borrow money in the near future for a 3 month-period, may fear that interest rates will have risen by the date of borrowing. Since a rise in interest rates would add to the cost of borrowing, a futures position is taken so that there would be an offsetting profit in the event of rise in interest rates. This involves selling 3-months interest rate futures. This can be made clear with the help of the following illustration:

	Cash market position	Position taken in futures market
Jan. 2	CFO intends to borrow Rs. 100 lacs on February 1. Fears that interest rate will rise above the current 10% p.a.	Sells 20 March future contracts, thereby notionally guaranteeing that Rs. 100 lacs will be borrowed at 10% p.a. on the March maturity date
Feb. 1	Borrows Rs. 100 lacs at an interest rate of 12% p.a.	Buys 20 March futures contacts thereby entering a notional commitment to lend Rs. 100 lacs the March Maturity date.

In this example, for the 3 months commencing 1 February the interest cost on the loan would be Rs. 50,000 more than would have been the case had the interest rate remained at 10% p.a. However, there is an offsetting gain from the futures position. For a future 3 - month period, the hedger is committed to lending at 12% p.a. and borrowing at 10% p.a. This provides a gain equal to 2% p.a. on Rs. 100,00,000 lacs for 3 months i.e. Rs. 50,000.

Thus, the CFO has successfully hedged by taking a futures position opposite to the underlying position. The increase in interest rates that caused a loss on the underlying position produced on offsetting gain from the future contract.

As with other futures, contracts, the vast majority of short-term IRF contracts are closed out prior to the maturity date. By the time of closing out, the hedger should have received, or paid, variation margin that offests movements in the interest rate. A potential borrower, for example, having to pay more because of increased interest rates, should have received a sum of money to compensate for the higher interest payments. If a contract is held to maturity there will be a final cash settlement based on the exchange delivery settlement price (the futures price at maturity)

[As short-term IRF contracts are quoted on an index basis the position in futures market can be depicted as follows :

	Position in futures market
Jan 2	Sells 20 March 3-month IRF contracts at a price of 90
Feb 1	Closes out by buying 20 March 3-month IRF contract at a price of 88
	Profit is 200 ticks at Rs. 12.50 per tick on each of 20 contracts i.e. Rs. 50,000.

The transactions in the futures market have provided a perfect hedge to the cash market transactions. The possibility that future interest rates might change by different amount from cash market interest rates produces basis risk. Such incomplete matching of interest rate changes can render hedging imperfect. This can be explained by assuming that futures interest rates rise to 11.5% p.a. as against cash market interest rates which rise to 12% p.a.

	Position in futures market
Jan 2	Sells 20 March 3-Month IRF contracts at a price of 90
Feb 1	Closes out by buying 20 March 3-Month IRF contracts at a price of 88.50
	Gain is 150 ticks at Rs. 12.50 per tick on each of 20 contracts i.e. Rs. 37,500

Thus, the gain on futures trading i.e. Rs. 37,500 is insufficent to offset completely the loss from cash market transactions i.e. Rs. 50,000. This happens because basis has changed from zero (90-90) to -.5 (88.0-88.5). The hedge is imperfect. Of course, if basis had changed so that futures interest rates were greater than cash market rates, the gain from futures trading would have been more than that required to offset the cash-market loss.

Need for IRF & emerging IRF market structure in India

As long as interest rates are fairly steady, little interest rate risk exit. In such a situation there would be no opportunity or need for IRF contracts. Till 1996-97 Indian banking was working in an environment of administered Interest rates and the changes were not frequent. With deregulation and volatility of Interest rates now, the banks and other financial institutions are facing the risk of adverse impact on their earnings. In such a scenario, the opportunity to avoid the interest rate risk is provided by IRD* products. It is desirable that banks do there best to minimise & avoid the large asset/liability mismatch they face today. However, there are some limitations as to how much the banks can do in this area. It is not always possible to avoid existing or emerging asset-liability mismatches since it may be difficult to coordinate such activities across the thousands of branches of bank. Secondly, it is always not feasible to displease depositors or borrowers merely to avoid asset- liability mismatch by either turning down deposits or refusing to lend for various maturites. It is in this area that the derivatives markets are of great help to banks in fine-tuning their policies.

At present, in India, there exists a reasonable OTC (Over-the-counter) market for IRD products eg. interest rate

*(Interest rate derivative)

swaps (IRS) and forward rate agreements (FRAs) but the need for exchange-traded interest -rate derivatives is felt to supplement the OTC derivatives. This is because the risk of OTC derivatives market cannot be hedged effectively in the absence of exchange - traded derivatives.

The RBI's Working Group on Rupee Derivatives has also felt the need for exchange-traded interest rate derivatives (ETIRD) especially, IRF as debt market volumes, particularly in IRS, have been growing rapidly and exchange-traded products would reduce the risk substantially through a clearing corporation, noration, multilateral netting, centralised settlement and risk management. The Group has recommended introduction of IRF in the form of the following four contracts :

a) Short-term MIBOR futures contract

b) MIFOR-futures contarct based on 6-month LIBOR and Rupee-dollar 6 months forward rate

c) Bond futures contract and

d) Long-term bond index futures contract

The Group considered that India has already set-up mature institutional infrastructure for trading, clearing and settlement in the equity markets which could be harnessed for the debt market.

Guidelines for enabling regulated entities to participate in ETIRF were finalised by the Reserve Bank in consultation with the Government and SEBI. Accordingly, it has been decided to allow scheduled commercial banks (SCBs) [excluding RRBS and LABs] primary dealers (PDs) & specified all India FIs to deal in ETIRF in a phased manner. In the first phase, the SEBI has decided. to introduce monymous order driven screen based system for trading in IREs on the Stock Exchange, Mumbai (BSE) and National Stock Exchange (NSE), which will facilitate participation by all classes of investors and increase market access across the country.

In this phase, such entities can transact only in IRFs on notional bonds and T-bills for the limited purpose of hedging the risk in their underlying investment portfolio. PDs are, however, allowed to hold trading positions in IRFs subject to some prudential regulations. Initially, only the interest rate risk inherent in the government securities classified under the AFS (Available for sale) and HFT (Hold for trading) categories have been allowed to be hedged. In the second phase, transactions in a wider range of products will be allowed and market making for entities other than PDs will be considered.

In accordance with these guidelines, Central Bank allowed banks & PDs to transact in IRF in June 2003 with PDs allowed to trade while bankers are not. However, recently in January 2004, it has been decided by an RBI Group on IRD, headed by G. Padmanabha, that banks with a minimum net worth of Rs. 200 crores and a capital adequacy ratio of 10% should be allowed to run a trading book in IRFs. This decision is

based on the view that banks having adequate internal risk management and control systems and robust operational frameworks could be allowed to run trading positions across various interest rate derivatives including interest rate futures.

However, this instrument has seen little interest in the market with most players finding the design of the product faulty. The task before us, therefore, is to find the reasons for this lack of interest in trading of IRFs.

One, the availability of few products in the market may actually translate into a costly trade-off between interest rate risk and basis risk. At present, there are three products in the market-the notional 91 days T-bills, the notional 10 year zero coupon bonds and the notional 6 per cent 10 year bond. These products do not fulfil the spectrum of heger's needs. This situation can be remedied by introducing more futures contract across the spot curve. That will provide hedgers more opportunities to horizon match their portfolio with that of futures contract thus, lowering the basis risk. Of course, the NSE has to be judicious in introducing more futures contract beause liquidity typically declines when more contracts are available.

An other hurdle seems to be the largely undirectional view on interest rates prevalent in the market currently. That means all market players expect the interest rate to be soft. In such a situation there may be no counterparty for hedgers. Unless the market carries different views on interest rate, there may not be active bid ask in the futures market. On the positive side may be a perception that the high level of liquidity in the banking system will drive down bond yields. And on the flip side, the belief that RBI's need to control inflation will lead to higher yields. The opposing forces may lend volatility to the yield curve. And that may trigger demand for IRFs. Moreover, the recent decision of allowing the banks to take trading positions also besides being the hedgers, will also help overcome this hurdle.

The fixed income money market derivatives association (FIMMDA) has made representations on developing the market to SEBI, the RBI and exchanges. It has also been proposed that banks should set up limits for trading in such products and get them approved by then respective Boards.

Besides overcoming these hurdles, another important thing to make the new financial investment IRF a success is to ensure whether various prerequisities for the successful introduction of IRFs are present in the Indian market.

Prerequisities for the success of IRFs in India

Before evaluating the success of ETIRF in India, it is important to be fully aware of the conditions which make the trading of IRFs successful in certain other countries eg. U.S.

In U.S., the investors in government securities including t-bills are a

diversified lot. It means that a highly diversified set of invertors including Banks, PDs, pension funds gilt funds, a wide range of financial intermediaries including investment banks and corporates etc. invest in gilts. This particular feature of US financial markets reflects differing motives/strategies to hold assets and trade in them. On the contrary, active trading in gilts itself is a very recent phenomenon in India. Moreover, the pattern of gilt trading does not reflect the same type of differing interests of marketing participants as the investor's base is not yet well-diversified. Historically, most of the traditional players like banks, insurance companies and provident funds that account for most of the investments in gilts believed for long in the philosophy of invest-to -hold for maturity.

If one futures markets are to function efficiently and avoid situation of market manipulation and market-squeeze, they need to be sufficiently diversified in regard to the investor base. To achieve this, they must exercise the following two-steps.

(a) The major potential players in the derivatives market like the public sector banks have to be induced to be more proactive so that the futures market get sufficient depth and liquidity.

(b) The market should be future broad based by ushering in several other players like the wide range of other financial intermediaries including the NBFCs and the gift-oriented mutual funds so that it comes to reflect a variety of investment and trading intentions.

Secondly, efficiency of the market will remain high if there are several mature players who attach due importance to a study of fundamentals and play by rational considerations. However, in India, there is an acute shortage of efficient players who would be willing to take positions based on their assessment of the fundamentals although that may not be in the same direction as the prevailing mood in the market. PDs are quite active in the Cash market for gilts but they are still new to the area of financial forecasting especially interest rate forecasting and derivatives. Foreign banks, on the other hand, possess good skills in treasury operations including derivatives, but they continue to account for a major share of OTC derivatives trade in the country. Also, they account for a relatively smaller segment of Indian banking. Thus, a major section of the investment community is not likely to participate actively and efficiently in the futures market because of the given lopsided development of the Indian market in regard to the skills set required for gilt-trading and interest rate for-ecasting. Such under developed financial markets provide enough scope for market manipulation even for players with limited financial resources primarily because the derivatives market are highly leveraged.

Thirdly, the presence of risk of building large open positions even by the operators with limited means because of lower level margins and consequently lower transaction costs requires to take all precautions before we introduce

exchange traded derivatives. In any case, it would not be fair to the Institutional/entities to be forced into go through the brokers alone for compulsorily executing all their orders merely because the current regulatory regime demands it. In this context, it should be recognized that the SCRA (Securities Contracts and Regulations Act) as it stands today is to be revamped.

Given the nature and importance of the institutional entities in ETIRF products trading, it would be desirable that they are permitted to route their orders from their own terminals to the exchange in their capacity as participant members. This privilege may be granted to the institutions on the condition that they will not do any client trade or trades on behalf of others. In short, institutional players should not compete with brokers for client business, if they are given access to exchange terminals for their proprietary transactions.