



**BSE**  
The Stock Exchange of India

Annual Capital  
Market Review '03

### SECTION 3 : MARKET TRENDS

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Manish Bansal is Assistant General Manager in Securities and Exchange Board of India (SEBI). He has more than 9 years of professional experience spanning across wide spectrum of the financial markets. Some of his specific contributions are product structuring and risk management of the equity derivatives like futures and options on indices and individual stocks, product design and risk management of the interest rate derivatives in the country, evolution of book building process for the primary market offerings of securities, process of buyback of shares by the companies. He has done CFA from ICFAI and MS from US.



## Interest Rate Futures

The introduction of trading in interest rate futures in the country heralds the beginning of a new era in the fixed income derivatives market. Initial hiccups with regard to the product design and variations from the global standards would settle down over a period of time and the product would emerge as a path breaker, paving the way for many more initiatives on the derivatives front.....

The introduction of trading in interest rate futures in India is one more step towards integration of the Indian Securities Market with the rest of the world. Globally, interest rate derivatives are the darlings of the market and account for around 70% of the total derivatives transactions across the economies. In India, it may be seen as a path breaking initiative because it is expected to pave the way for various innovations at the derivatives front in the time to come.

Although market participants have unanimously appreciated the initiative, there appears to exist certain apprehensions in their mind with regard to the product design. This work attempts to address those issues. Accordingly, this article concentrates on interest rate products in the global context, their structure in the Indian market, points of differences and how to look at them.

#### **Introduction to interest rate futures**

We all are familiar with forward contracts. They are essentially over-the-counter (OTC) contracts traded on one to one basis among the parties involved, for settlement on a future date. The terms of these contracts are decided by the parties mutually at the time of their initiation. If a forward contract is entered into through an exchange, traded on the exchange and settled through the Clearing Corporation/ House of the exchange, it becomes a futures contract. As one of the most important objectives behind bringing the contract to the exchange is to create marketability, futures contracts are standardized contracts so designed by the exchanges as to ensure participation of a wide range of market participants. In other words, futures contracts are standardized forward contracts traded on the exchanges and settled through their clearing corporation/house.

Futures contracts being standardized contracts appeal to a wide range of market participants and are therefore very liquid. On the other hand, the clearing corporation/house, in addition to settling the futures contracts, becomes the counter-party to all such trades or provides unconditional guarantee for their settlement, thereby ensuring financial integrity of the entire system. Therefore, although futures contracts take away the flexibility of the parties in terms of designing the contract, they offer competitive

advantages over the forward contracts in terms of better liquidity and risk management.

Now, it is simple to comprehend that futures contracts on interest rates would be called interest rate futures. Let us look at the Forward Rate Agreements (FRAs) being traded in the OTC market. In case of FRAs, contracting parties agree to pay or receive a specific rate of interest for a specific period, after a specific period of time, on a specified notional amount. No exchange of the principal amount takes place among the parties at any point in time. Now, think about bringing this contract to the exchange. If we bring this FRA to the exchange, it would essentially be renamed as a futures contract. For instance, Eurodollar futures contract (most popular contract globally) is an exchange traded FRA on 3 months Eurodollar deposits rates.

To comprehend the product further, now think we are entering into an FRA on an exchange. First thing would be that we would trade this contract on the exchange in the form of a standard product in terms of the notional amount, delivery and settlement, margins etc. Having entered into the contract, we can reverse the transaction at any point of time. Indeed, having reversed, we can again enter into the contract anytime. Therefore, these exchange traded FRAs (futures contracts) would be very liquidity. Further, in this contract, clearing corporation / house would bear the counterparty risk.

The transaction mentioned above is pretty simple. But, world does not trade the interest rate futures so simply. Indeed, product designs are much more complicated and they are different both at the long and short end of the maturity curve.

Let us have a look at a few global products on interest rate futures.

#### Interest rate futures in the global context

Most of the global markets trade futures on two underlyings - one at the long end (maturity of 10 years or more) and another at the short end (maturity up to one year) of the yield curve. The futures on the long end of the yield curve are called the Long Bond Futures and futures at the short end of the yield curve are called the T-Bill Futures and Reference Rate Futures. Some markets do trade futures on underlyings with multiple maturities say of 2 years and 5 years as well, but volumes in these products speak for their poor receptivity by market participants. In other words, most of the volumes in the global markets are concentrated on derivatives with one underlying at the long end and one underlying at the short end of the yield curve.

In global markets, underlying for the long bond futures is a notional coupon bearing bond. These contracts are generally physically settled but some markets do have cash settled products. For instance, Singapore trades 5 years gilt futures, which are cash settled. Chicago Board of Trade (CBOT) also trades futures on the 10 year Municipal Bond Index, which is also a cash settled product. Methodology of the physically settled products is beyond the scope of this work. The simple thing to understand here is that there are concepts like basket of deliverable bonds, conversion factors, cheapest to deliver bond, delivery month etc. Price quote for long bond futures is the clean price of the notional bond, across the markets.

On the short end of the yield curve, global markets have two kinds of products - T-Bill futures and reference rate futures. T-Bill futures are essentially the futures on the notional T-Bills, which are physically settled. But, reference rate futures are the futures on reference rates like London Inter-bank Offer

Rates (LIBOR) and are cash settled. Over a period of time, these reference rate futures have rendered the T-Bill futures out of fashion. Possible reasons for this phenomenon are that they are easy to comprehend, have very wide participation from across the globe and are cash settled. The success of reference rate futures may be measured by the volumes they command in the international markets. Indeed, all major markets across the globe trade them. For instance, Japan trades futures on the Japan inter-bank offer rates (JIBOR), Singapore trades futures on Singapore inter-bank offer rates (SIBOR), Hong Kong trades futures on Hong Kong inter-bank offer rates (HIBOR).

**The introduction of trading in interest rate futures in India is one more step towards integration of the Indian Securities Market with the rest of the world. Globally, interest rate derivatives are the darlings of the market and account for around 70% of the total derivatives transactions across the economies. In India, it may be seen as a path breaking initiative because it is expected to pave the way for various innovations at the derivatives front in the time to come.**

#### Structure of the product in the Indian Market

Products proposed to be launched in the Indian Market are futures on long bond (10 year notional G-secs) and T-bills (91 days notional). This is in line with the international practice on the interest rate derivatives. Reference rate short end products i.e. the futures on Mumbai Inter-bank Offer Rate (MIBOR), Mumbai Implicit Forward Offer Rate (MIFOR) etc. are proposed to be launched after certain legal issues related to these products are resolved. Issues like the coupon of the underlying notional long bond and the maturity of the futures contract (subject to it being maximum of one year) are left to the exchanges to decide upon.

Both these products Long bond futures and T-Bill futures are proposed to be settled in cash based on the Zero Coupon Yield Curve (ZCYC). The final settlement value of these futures contract would be the present value of all future cash flows from the underlying discounted at the zero coupon rates for the corresponding maturities taken from the ZCYC. This methodology would also be used to price the product theoretically for the Marking to Market (MTM) purpose, in case futures do not see any trade during the last half an hour of trading. The ZCYC is proposed to be derived from the actual traded prices of the Government Securities each day, reported on the Wholesale Debt Market (WDM) of the Exchange or the price data collected from the Negotiated Dealing System (NDS).

## Issues with the Product

Two major points of differentiation between the configuration of the proposed products in India and the internationally traded interest rate futures are:

1. Products proposed in India are cash settled while internationally traded interest rate futures are largely physically settled.
2. Methodology for cash settlement of futures contracts using ZCYC based approach is nowhere used across the globe.

Let us address these issues one by one.

Products proposed in India are cash settled while internationally traded interest rate futures are largely physically settled.

Actually, this is an issue of debate between the cash settled vs. physically settled derivatives. Worldwide, both cash settled and physically settled derivatives are traded with equal enthusiasm for a variety of reasons. Though the physically settled products offer better hedge and better arbitrage opportunities, they have their own share of competitive disadvantages in terms of the settlement risks and possibility of short squeeze. Short squeeze occurs when the participants with short (sold) positions in the market do not find sufficient underlying in the system to buy and honor their obligations. Short squeeze becomes a major issue specially when the underlying is not very liquid and/or has limited outstanding.

Government Securities have a typical pattern of trading across the globe including in India. Some maturity baskets like 5 years, 10 years, 15 years are pretty liquid in comparison to other maturity baskets. Further, within a specific maturity basket only few securities (generally on-the-run securities, which have yields close to the prevailing yields in the economy) command the volumes. In this environment, markets either choose to have cash settled products or delivery based products linked to a basket of underlying (not a single bond). In case of delivery based products, the basket of deliverable bonds is chosen based on certain criteria such as the outstanding maturity, outstanding amount etc. Still, in the past there have been instances of the short squeeze with delivery based products, in the global markets. Probably, that is the reason why some markets have chosen to go ahead with the cash settled products, which are much easier to understand and trade. For instance, Singapore trades 5 years gilt futures, which are cash settled and are doing absolutely great.

Further, India has been trading cash settled equity derivatives (futures and options) both on indices and individual stocks. There are plans to move to the physically settled equity derivatives over the period of time. The introduction of interest rate derivatives also appear to have been planned on similar lines i.e. start with cash settlement and then move to the physically settled products over a period of time.

Although physically settled products integrate both cash and derivatives market better, in my opinion, the decision to start with the cash settled products is a prudent one going by our own experience with cash settled equity derivatives and the problems linked to the delivery based products. Further, with maturing markets, accumulated experiences and built up competencies, markets can always migrate to the delivery based products.

Methodology for cash settlement of futures contracts using ZCYC based approach is nowhere used across the globe.

India has been trading cash settled equity derivatives for quite sometime now. Volumes in these products make me feel that market participants are comfortable with the structure of these products. Accordingly, a segment of the market participants seems to have no complaint about the cash settled interest rate futures but worried about the way these products are proposed to be finally settled. Market participants have been voicing concerns about the ZCYC based approach for the final settlement of the futures contracts. Issues raised are many:

- a. Instead of ZCYC based final settlement, we may settle the product based on polled yields.
- b. Market has been using the yield to maturity (YTM) and not ZCYC for various purposes. So better if we use YTM and not ZCYC.
- c. The ZCYC based approach is complex and difficult to understand.
- d. ZCYC is being computed in the black box and transparency is an issue.
- e. Modeling errors with the ZCYC is a major problem.

Let us contemplate over these issues one by one.

- a) The first issue is that of final settlement of the futures contracts based on polled price vs. the ZCYC based approach. Market has been demanding that the final settlement of futures contracts should be based on polled yields and not ZCYC. These arguments are based on the international practice on cash settled interest rate futures and the comfort of market participants with the approach. For instance, Singapore 5 years Gilt Futures are cash settled based on the polled prices from the 11 Primary Dealers appointed by the Monetary Authority of Singapore (MAS). Further, as market has been trading various derivatives like swaps and FRAs on the polled prices (MIBOR and MIFOR), it would be easy for the market to understand the approach.

Though it is right that the prices based on polled yields (YTM) are much easier to understand and comprehend and there is a precedent in this regard in the Global Markets, it may not be the most scientific way to settle the product. All of us would appreciate that to price a fixed income instrument correctly, its cash flows at the different time horizons must be discounted at the different yields corresponding to their maturity. This may be more complex computationally, but is a more systematic approach to pricing such products.

Further, there are issues with regard to polled prices like transparency and lack of commitment on the participating agencies in the polling process. A segment of the market participants feels that polled prices are governed by the limited number of market participants and in case market participants are also trading in the market, there is a possibility of conflict of interest. Further, as there is no financial commitment on the part of these market participants, their quotes may not reflect the expectations of the overall market. However, some market participants still argue in favor of polled prices based cash settlement approach after addressing the issues raised above because of their comfort.

My sense is that this issue of polled price vs. ZCYC is limited only to the cash settlement of the futures contracts and once we migrate to the physical settlement of these products there would not be any issue at all. Committee on the subject has already recommended the physical settlement of the products over the period of time.

- b) The second issue relates to the pricing of fixed income instrument based on YTM vs. ZCYC. In my opinion, as mentioned above, though ZCYC based approach is more difficult, it is more scientific and correct to use that to price the fixed income products. Now, the issue is to make a choice between an easy and practically incorrect approach or the correct and more scientific approach to the subject. At any given point in time, my sense is that we must go with later.

Further, if we look at the issue conceptually, YTM is nothing but a single number (yield) representing all the points on the yield curve over the life of the bond. It is the single yield, which equates the price of the bond with the present value of all its future cash flows. Therefore, YTM can easily be derived from the computed theoretical price based on the ZCYC and the given coupons of the notional bond. In other words, first we may price the notional bond based on ZCYC and then use this price with coupons to rework and find the YTM. This needs a simple piece of software. Indeed, this may be done by the exchanges themselves to give comfort to the market participants.

- c) Third issue is the difficulty in understanding the ZCYC based approach. It is undoubtedly true; but world is becoming increasingly complex and so also the financial products. Complexity is something we all need to learn to deal with. Just to escape the complexities, we may not continue with something which is scientifically incorrect. Indeed, global markets have no way but to adopt the ZCYC based approach to price the fixed income instruments. Further, the whole mathematical part is to be taken care of by the computers and we need to just understand the way ZCYC would be computed and used to price the said products.

We all would agree that the grasping power of the Indian securities market participants is phenomenal. They may have struggled with the definitions of call and put options two years ago (when equity options were first introduced) but today the same set of people state that straddle and strangle are conventional products and they need to migrate to the exotic stuff. It is certainly proof of their growing experience in the derivatives markets and the resulting confidence in their abilities to use such complex products for their own benefit.

- d) As regards the issue of non-transparency of computation of ZCYC, full computational methodology is required to be made available on the website of the exchange or the ZCYC service provider. It would not be difficult for any one in the market to create his or her own ZCYC based on the given methodology. Therefore, the non-transparency argument does not really hold water. Further argument may be whether we really know how Mibor, Mifor etc. are computed. It is all the confidence in and the credibility of the service provider, which is built over the period of time. It is believed that the same would happen with the ZCYC as well.
- e) On modeling errors related to the ZCYC, I would agree with the market participants. Modeling errors create basis risk for the market participants but we need to appreciate that this error exists even in the markets, where such contracts are settled through delivery. This happens because in all these markets, traded products are the futures/options on underlying, which is not a specific bond but a set of eligible bonds for the purpose. In other words, this is a kind of cross

hedge (one underlying being hedged by derivative on some other underlying), which always carries some basis risk.

Therefore, issues with the product exist but they would be tackled over a period of time. Indeed, the ZCYC providers would make sincere efforts to minimize the errors between the theoretical price of the actual traded bonds based on the ZCYC and their actual market prices. Further, as long as market knows that there is a possibility of certain errors, it discounts for the same while pricing the products. It is also believed that with the smoothening yield curve and its improved accuracy, the market would automatically gain the confidence.

### The Road Ahead

Introduction of Interest Rate Futures is an excellent example of collaborative efforts on the part of market participants, exchanges and regulators. It is a great addition to the existing portfolio of financial products in the Indian Financial Markets. Now, we need to quickly work on the products proposed in the Technical paper prepared by the Securities and Exchange Board of India's (SEBI) risk management group. Availability of the large number of products always creates more and more opportunities for trading, which in turn result in the better price discovery and efficiency in the system.

The SEBI's risk management group has recommended that reference rate products linked to the MIBOR and MIFOR be introduced in the market only after all related legal issues have been addressed in order to avoid the legal risk. Once the said issues are resolved, market would see these products, which are well established and extremely popular globally. The market participants also appear to be really looking forward to these reference rate products.

Another issue is that the market participants should be given the freedom to use these products. Focus of regulations should be on the proper disclosures and the transparency in the operations of the market participants instead of putting the restrictions on their usage. Strategic uses of the products are discovered and rediscovered by the market participants on day to day basis and any kind of restrictions on the products' usage hamper the market developments by containing the creativity and imagination of the market place. Therefore, market participants must be given the freedom to explore the value creation opportunities with these products, within the given framework.

### Conclusion

I strongly believe that sometimes precedents limit the creativity. If there is no precedent it does not mean that the idea is bad; Indeed, it means the idea is different and may be revolutionary. Therefore, it would not be surprising if other markets across the globe learn something from the Indian approach to interest rate futures and start redefining their product structures.

Further, though there are apprehensions among the market participants about the structure of the products proposed, they would fade away with the passage of time once the benefits of the proposed structure take effect. We all would appreciate that the development of a new market is an evolutionary process. Issues exist but they in no way write off the value delivering capabilities of the innovative products. All issues have the solution and we have to stay focused on them. Ultimately, all in the market want to see the markets growing and maturing.