Report of the informal Group on STRIPS

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I. INTRODUCTION

STRIPS is the acronym for Separate Trading of Registered Interest and Principal Securities. Stripping is the process of separating a standard coupon-bearing bond into its individual coupon and principal components. For example, a 5 year coupon bearing bond can be stripped into 10 coupon and one principal instruments, all of which thenceforth would become zero coupon bonds.

In an *official STRIPS market* for the Government securities, these stripped securities i.e., the newly created zero coupon bonds remain the *direct obligations of the Government* and are *registered* in the books of the agent meant for this purpose. Thus the mechanics of stripping neither impacts the direct cost of borrowing nor change the timing or quantum of the underlying cash flows; stripping only facilitates transferring the right to ownership of individual cash flows.

When STRIPS made a beginning in the early seventies in the US, the initial motivation came in the form of tax benefits. The process of stripping facilitated the holders of a US Treasury Bond to separate the component pieces, then to sell the principal component which by then became a zero coupon bond and then claim capital loss on the transaction. Furthermore, while the holders of the coupon STRIPS continued to enjoy the income stream, tax was paid not on the accrued income but only when these coupon STRIPS matured or were sold. Such market behaviour, apart from resulting in significant revenue losses, also led to deferment of tax. The anomaly was ultimately rectified through the Tax Equity and Fiscal Responsibility Act (TEFRA) of 1982, which required the holders of zero coupon bonds to accrue a portion of the discount towards par each year.

Advantages

STRIPS would facilitate the availability of zero coupon bonds (ZCBs) to the investors and traders. They provide the most basic cash flow structure thus offering the advantage of more accurate matching of liabilities without reinvestment risk and a precise management of cash flows. Thus to some investors who set the incoming inflows against an actuarial book (eg. Insurance companies), STRIPS offer excellent investment choices. Apart from the advantages they offer to low risk investors like pension funds and insurance companies, STRIPS offer much greater leverage to hedge funds, since the zero coupon bonds are more volatile than the underlying coupon bearing bonds. Due to the divergent interests of different segments of investors in the market, demand for each component of the STRIPS could be so great that the sum of the values of the constituent parts exceeded the value of the whole bond. Herein lies the major appeal for traders. Last but not the least, STRIPS offer an excellent scope to construct a zero yield curve for the sovereign bond market.

Need and Scope

The government securities market in India is dominated by captive investors like banks, insurance companies and provident funds, of which the banking system continues to be the predominant holder of and investor in Government securities. While, earlier it used to be mainly the statutory requirements which compelled the banking system to invest a major portion of their liabilities in Government securities, in the recent past, their investment decisions have been guided by the capital adequacy, income recognition and provisioning norms. With a significant portion of banks' assets in dated government securities and most of the liabilities upto 3 years there is a growing concern about the asset liability mismatches and their impact on the banks' balance sheets. On the other hand, an efficient and long-term debt management strategy need to ensure that the debt profile does not have an over-concentration at the short-end and would try to even out the redemption pattern, thereby minimizing the refinancing risk. STRIPS, through the creation of securities of varied maturities from a single coupon bearing instrument offers investment opportunities for diverse investor groups having different investment horizons.

In the past, RBI has introduced several non-conventional government securities, such as zero coupon bonds, floating rate bonds, index linked bonds etc., of which the zero coupon bonds were quite popular with the markets. However, being discounted bonds, the cash

inflows happen to be smaller for a specific issue size that goes by the face or nominal value, the lesser the amount the greater the term to maturity of the bond. The existing budget accounting does not have a system of providing for amortised payments. STRIPS, essentially zero coupon securities, being thus created by the markets and not by the issuer circumvents these problems while offering all the benefits of investing in a zero coupon security.

Apart from providing an instrument to handle the ALM/interest rate mismatches of banks on account of their large portfolios of Government securities other reasons that favour a STRIPS market for Government securities in India are the scope offered by the insurance sector on the one hand and the private pension funds and individual pension provisions. Their investment strategies would be guided by their primary objective of matching their assets to an actuarial book. Besides, STRIPS add to the menu of investment avenues presently available to the market.

Present study

Earlier an internal group was constituted on July 21, 1997 to go into various aspects associated with the introduction of STRIPS in Government securities market. The informal working group submitted its report in January, 1999. The Report discussed in detail the objectives of stripping, country experiences, necessary changes in the legal framework and the mechanics of stripping.

The present paper addresses the following

1. Identification of strippable stocks
2. Examining the issues involved in consolidation of securities and alignment of coupon payment dates
3. Issue of fungibility and
4. Examining various issues involved in stripping

II. PRECONDITIONS FOR AN OFFICIAL STRIPS MARKET AND FEATURES OF STRIPS

Benchmark issuance and creation of volumes

For a typical issue size of Rs.5000 crore, a stock carrying a coupon of say 10 per cent per annum, would create a single coupon (semi annual coupon payments) flow of Rs.250 crore. On its own, this kind of a size may not go well for market liquidity. Hence, there is a need to create volumes in any single issuance to make it suitable for viable stripping. On the other hand there is a limitation upto which the size of a single issuance could be raised; this will then have implications for sustainable repayment levels at any single point of time and the refinancing risk. Even for an issue size of Rs.15,000 crore, at 10 per cent coupon, the single coupon flow will be Rs.750 crore and STRIPS being zero coupon bonds, the discounted value (cash price) of coupons will be much lesser, especially those for the longer maturities. Once the coupon payments of different stocks are made fungible, volumes could be created in STRIPS across maturities.

Fungibility

An important feature of the STRIPS market is that the coupon STRIPS of the same date from different stocks are fungible - meaning that they are just not identical but exchangeable. Thus when a few coupon bearing bonds sharing the same coupon payment dates are stripped, it may not be possible to distinguish the coupon STRIPS created out of all these bonds. To elaborate further, such coupon STRIPS do not refer to the bonds from which they were derived, and will be identified by their maturity dates. Further, all STRIPS will have a unique code number to identify. Going by the same logic, these coupon STRIPS could be used to complete the reconstitution of any of those original coupon bearing bonds whose coupon payment dates fall on the same date (provided the purchaser holds all the other coupon and principal STRIPS).

Whether principal STRIPS need to be made fungible with each other and with coupon STRIPS?

As is the case with coupon STRIPS having same maturity dates, coupon STRIPS could be made fungible with the principal STRIPS having same maturity date. This process although increases liquidity is fraught with an inherent problem i.e., the market could create more of coupon bearing stock through the reconstitution facility than what had been originally issued. The same reason is applicable to making principal STRIPS maturing on the same day, fungible. This process, if allowed, apart from creating uncertainty as to the size of the original issues to the detriment of the holders also will have implications to the maturity profile management.

Minimum Reconstitutable and Strippable amount

For operational convenience the size of coupon STRIPS and principal STRIPS should be in whole paise so as to allow reconstitution. For example, for a 11.99 per cent Government stock, 2009, it will not be possible to reconstitute to, say, an amount of Rs.500, since the necessary coupon STRIPS would be Rs.29.975. Across the Stocks, it would be possible to reconstitute if the standard minimum coupon strip is Rs.1,000. Accordingly, the minimum strippable amount could be either kept at Rs.1,000 or Rs.10,000 and be increased in similar multiples.

Book entry settlement system and mechanisation

Looking at the massive work involved, operational efficiency demands that STRIPS should be held in the book entry form and that stripping and reconstitution needs a highly computerised environment. The proposed electronic negotiated dealing system and securities settlement system with connectivity amongst various Public Debt Offices, is expected to take care of the infrastructural needs for an official STRIPS market in Government securities.

Trading and pricing

There are two things that determine the prices of STRIPS viz., (i) the market mechanism of supply and demand and (ii) the prices of the underlying strippable and similar non-strippable stocks. Since STRIPS are the component parts of the underlying stock from which they are created, theoretically, the price of any strippable stock should be exactly equal to the sum of the prices of all its component parts. This is an additional force at work, which ensures that there should be price parity between the STRIPS and strippable stocks. This would mean that any disparity between the market values of the strippable stock and the STRIPS emanated form it would give a risk free arbitrage opportunity and the market mechanism will gradually drive the prices back into line. In practice, however, the theoretical zero-curve does not guide the distribution of strip yields. Some STRIPS, because of the demand and liquidity, will trade higher or lower than the theoretical zero-curve. But to maintain the parity principal, if one part of the strip curve is trading relatively rich then another part must trade cheap to keep the overall bond/strip price mechanism in line. Further, the experience with established STRIPS markets does indicate that the principal strip trades at a lower yield compared to a coupon strip

maturing on the same day owing to the larger size and consequently the greater liquidity of the former.

STRIPS will be traded in the same way as the coupon bearing bonds except for the fact that, being zero coupon securities, will normally be quoted on yield basis. This facilitates an immediate comparison across bonds of different maturities (see box). From a trader's point of view, the most important features of STRIPS are their higher Duration or price sensitivity. Higher Duration would mean that STRIPS are more sensitive to interest rate movements compared with coupon bearing bonds. Hence repos in STRIPS require additional initial margins.

Some of the popular trading strategies are given in Annex I.

Valuation of stripped bonds - the concept of zero curve

A conventional yield curve is drawn by plotting the yields to maturity of a series of coupon bearing bonds against their term to maturity. Such an yield curve is not suitable for valuing STRIPS because of the distortions caused by two factors viz., different coupon rates and the concept of yield to maturity (ytm). While different coupon rates do not afford proper comparison, the drawback of ytm is that it assumes that the investor holds on to a particular investment till maturity and that the intermediate cash flows are reinvested at the ytm thus ignoring the potential re-investment risk.

In order to value a strip/zero coupon bond, therefore, it is necessary to build a zero coupon curve. The main difference between a conventional yield curve and a zero yield curve is that, on the latter, any point will indicate the rate at which a *single separate* cash flow should be discounted, while on the former, any point will indicate the rate at which *all* the cash flows should be discounted.

Zero Coupon Yield Curve

The yield to maturity for coupon bonds is capable of several algebraically equivalent definitions A straight forward definition of yield to maturity is the single discount rate

that equates the bond's cash flows to the market price of the bond. But a coupon paying bonds can be viewed as a combination of separate bonds of varying maturities (of the coupons and the principal). From this point of view , it is reasonable to ask what the rate of interest on each of these loans are. In general any bond can be represented by an equation of the form:

$P= C1/(1+{}^{0}F_1) + C1/\{(1+{}^{0}F_1)(1+{}^{1}F_2)\} +C1/\{(1+{}^{0}F_1)(1+{}^{1}F_2)(1+{}^{2}F_3)\} + \ldots\ldots$

Where ${}^{i}F_r$ = Discount rate for cash flows at the end of r period (i.e. the cash flow r-i periods from i th period.). The rates represented by F's are also known as forward rates and they are related to the zero coupon rates (i.e. the rate at which a single cash flow at any point of time in the future is discounted) by the following equation:

$(1+ r_k)^k = (1+r_i)^i \times (1+ {}^{i}F_k)^{(k-i)}$ where r_k is the k period discount rate and $r_1={}^{0}F_1$

The point that is to be emphasized about the zero coupon rates are that they are unique for a given period . To illustrate , if we say that the 6 monthly zero coupon rate is 9.63%, then all cash flows for any bonds 6 months from now have to be discounted by 9.63% i.e. zero coupon discount rates are *period specific* and not *bond specific*. A zero coupon curve is the great invisible reality of the of the fixed income markets and it solves the bulk of the pricing problems in fixed income markets (ignoring default risk).

The pricing of securities based on Yield to Maturity (YTM) suffers from the defect that although a security represents a series of cash flows occurring at different points of time, they are discounted at the same rate. Hence the YTM can be regarded as a weighted average discount rate for forward rates where the weights are the corresponding cash flows . Since the cash flows of a bond is unique, so is its YTM. In fact, if the forward curve is sharply upward sloping, the YTM of a low coupon security should be more than a high coupon security of identical tenor. This *coupon effect,* as it is known, is totally missed if the decisions are based on YTM. With the introduction of STRIPS, the pricing of the primary market offerings have also to be oriented towards zero coupon valuation method so as to address the problems of valuation arising out of YTM methodology.

Does stripping result in squeezes?

After a stock has been stripped, that amount of the original stock is extinguished and replaced by an equivalent amount of stripped securities. If any person holds any one of the stripped securities, he can prevent reconstitution of a certain amount of the original stock. This feature is expected to occur in the STRIPS market from time to time and results in squeezes in both the cash and repo markets.

Motivation

Some studies do indicate that little of this activity (stripping and reconstitution) is directly related to the actions of speculators or arbitrageurs attempting to exploit profit opportunities. In contrast, market participants' use of STRIPS program appears to be primarily for making markets more complete, and exploiting accounting and tax asymmetries.

Who can strip and reconstitute

Stripping/reconstitution may be allowed to be performed by only a limited number of intermediaries along with the debt manager on the specific requisition from the holders.

III.BLUEPRINT FOR INTRODUCTION OF STRIPS IN GOVERNMENT SECURITES MARKET

Consolidation of loans

Recognising the fact that too many loans with small outstanding amounts would impact the market liquidity for government securities, in the Monetary and Credit Policy statement for the first half of 1999-2000, Governor has indicated that consolidation of outstanding loans would be necessary for ensuring sufficient volumes and liquidity in any one issue and that such consolidation would also facilitate the emergence of benchmarks and development of STRIPS.

So far, to the possible extent and taking care of the impact on maturity profile, fresh borrowings are raised through re-issuance or through re-openings of existing loans. This kind of passive consolidation has contained the number of loans more or less to the level at which they were by the end of fiscal year 1998-99, despite the fact that, RBI entered

the market around than 85 times since then. Of the total outstanding 112 loans, 42 loans with outstanding balances of Rs.5,000 crore and above (less than 38 per cent) account for 76 per cent of the total outstanding amount and 21 loans with outstanding balances of Rs.10,000 crore and above (less than 19 per cent of the total loans) account for more than 48 per cent of the total outstanding amount.

As regards an active consolidation i.e., consolidation among existing loans, is concerned, it may be better to adopt the law of attrition in those cases for the following reasons.

1. Legal obstacles in the way of consolidating pre-1992 loans with post-1992 loans
2. Absence of call provisions in the loan notifications hinders extinguishing whole loans. Investors can only be given an option and cannot be compelled to put back their loans against cash or other loans. However, this may not reduce the total number of loans, if the whole loans are not put back.
3. Of around 39 outstanding loans issued prior to 1992 , 16 will be maturing by year 2005-06.
4. Any horizontal consolidation (consolidation of loans maturing in particular year) can result in bunching of repayments.

Alignment of coupon payment dates

Wherever possible new issuance of loans have to be made in such a way that coupon payments across loans are aligned. A view may be taken in this regard to have a set of fixed coupon payment dates for the purpose of issuing strippable stocks in future; suggested dates for coupon payments are the 15th of March, June, September and December which also coincide with tax payments and could therefore minimise mismatches for the Government.. Another issue is the feasibility of aligning the coupon payment dates of existing loans. This would involve changing of coupon payment dates unilaterally without any mandate from the investors apart from creating avoidable confusion in the market as well as operational difficulties. Keeping in view the progress made in passive consolidation efforts, it would not be difficult to create enough strippable securities with critical volumes.

Ultimately a limited number of aligned coupon payment dates need to be involved, keeping in view both the needs of creating volumes, sustainability of repayments and providing different dates for investors.

Benchmark volumes

The issuance of benchmark securities could be made a supplementary objective of the STRIPS scheme. This would facilitate issuance of same benchmark securities year after year thus smoothening the maturity profile of the outstanding loans.

Strippable stocks

For stripping, a list of identified stocks is given in the Annex II. These stocks are prima facie identified on the basis of total volume of coupon STRIPS they could deliver (either by themselves or through future issuance whereby the coupon payments could be aligned) which are critical for a liquid STRIPS market.

Notification

While there is a need to issue a notification with regard to those existing loans which are intended to be made strippable, in the case of issuance of new stocks, the relevant notification henceforth should make a mention that the said stock would be strippable.

Taxation

The maiden issue of zero coupon bonds was made in January, 1994. In response to the queries raised by the Reserve Bank of India then, the Central Board of Direct Taxes (CBDT) has given the following clarifications:

1. The difference between the bid price and the redemption price of the zero coupon bonds will be treated as interest income assessable under the Income-Tax Act. On transfer of the bonds before maturity the difference between the sale consideration and the bid money in the hands of the initial subscriber is in the nature of capital gains. Similarly, on subsequent trading of the bonds, the difference between the sale consideration and the cost of acquisition is in the nature of capital gains. On final redemption however, no capital gains will arise.

2. In respect of the assessees who maintain their accounts on cash basis the interest income will be taxed as income of the accounting year in which the bonds mature. In

the cases where income is accounted for on mercantile basis (accrual basis) the income will be taxed at the end of the year.

3. Tax will be deducted at source on the difference between the bid price and the price of redemption at the time of maturity.

As regards clarification no. 3, Reserve Bank expressed certain reservations, which were turned down by CBDT. This however, has become a non-issue subsequent to the exemption given for government securities from the provisions of tax deduction at source (TDS). The clarification no.1 still remains controversial, since the transfer of bonds before maturity attracts provisions of capital gains tax whereas, the redemption of the bonds on maturity does not do so.

Income or capital gains?

In view of the definition offered by section 2 (28A) of the Income Tax Act, the term 'interest' is very wide and could include any payment, whether described as interest or otherwise. Since deep discount bonds do not carry interest, the return available to the holder of the bonds by way of discount is in the nature of interest. Accordingly the bondholder is under an obligation to treat the pro rata amount as his interest income for each year and offer it for taxation.

However, in the case of commercial paper (CPs) and Certificate of Deposits (CDs), CBDT has clarified that the discount is not treated as interest payment. Going by this analogy, the discount in the case of zero coupon bonds are not in the nature of interest payments, and the difference between the cost and sale price need to treated as capital gains/losses.

Given the present treatment of zero coupon bonds for taxation purposes, the instrument is not suitable for the small investor who follows a buy and hold strategy. This apart, in a broader perspective, in view of our objective to create a STRIPS market, the issue needs a wider deliberation. In this context it is also useful to draw parallels from the developed market.

STRIPS and tax laws in US and UK:

In the US, beginning in the 1970s, aggressive interpretation of Federal Tax laws encouraged some dealers and investors to separate the component pieces of US Treasury Bonds. Thus began the market for STRIPS. Because of the significant loss of tax revenue, the Treasury did not encourage this practice. Finally the Congress, through the Tax Equity and Fiscal Responsibility Act of 1982 (TEFRA), required the holders of zero coupon and original issue discount securities to accrue a portion of the discount toward par each year, and to report this as yet unrealised accrual as taxable income.

In the UK, the return on gilt STRIPS held by companies is treated in the same way as returns from unstripped bonds i.e., the total return is taxed as income in a company's annual tax assessment. In the case of non-corporates, the difference between the sale and purchase prices are taxable each year; there is a deemed disposal and acquisition at the end of each tax year. Profits made by individuals are assessable each year as income, with no charge to capital gains tax; any loss is relievable against income in the year concerned. *This kind of treatment minimises the differences between the tax treatment of STRIPS held by non corporates and that of unstripped gilts, and thus minimises the risk of tax-induced distortions arising in the pricing of a bundle of compared with the price of the strippable bond from which they were derived.*

In the Indian context, though benefits of capital gains are attributed to certain types of government securities viz., index linked bonds, institutions especially banks being the major investors, the benefits are not accruing to these investors. This is because of the fact that the banks are supposed to be treating them as *stock in trade* and hence is not eligible for capital gains tax.

Legal issues

In the draft Government Securities Act, necessary clauses have been included, wherever necessary, to facilitate stripping and reconstitution. Repos in STRIPS could be facilitated by RBI since RBI is the regulatory authority for repos.

Repos in STRIPS

Repos in STRIPS need careful monitoring and higher margining requirements to take care of their duration and volatility characteristics. These would be expected to be taken care of by the clearing corporation, being set up.

Implication for SLR

STRIPS are, in fact, not originally issued zero coupon bonds. Hence, the process of stripping should not bring any change in the outstanding SLR securities.

Annexure I

Trading Strategies facilitated by STRIPS:

1. Barbell and butterfly strategies: A barbell strategy involves selling of an intermediate coupon bearing bond and simultaneously purchasing a duration weighted combination of a shorter and a longer bond using the sale proceeds. A butterfly strategy involves an exactly opposite mechanism. A barbell strategy has two advantages viz., it increases the holding period return and increases the convexity of the portfolio. Hence, the relative performance of such strategies is subject to the yield curve risk. A barbell strategy is preferred when the curve steepens and if the curve flattens the butterfly strategy could prove profitable.
2. Belly Zone Trades: Experience indicates that normally, in any STRIPS market, the demand for long maturity principals will be strong, making investments at the very long end of the curve expensive. The resultant arbitrage conditions then forces the belly of the zero coupon curve up. This feature throws up opportunities to players in the STRIPS market to create and reconstitute STRIPS and coupon bearing securities at different points on the curve to make use of the arbitraging opportunities.
3. Bond replication: Whenever there is an imbalance between the prices of the underlying coupon bearing stock and the sum of the prices of the component parts i.e., STRIPS, this is the most preferred trading strategy to exploit the resultant risk-free arbitraging opportunity.
4. Rolling down the curve: When the yield curve is normal i.e., upward sloping, the zero coupon curve will be above the par curve, especially at short maturities. In such a scenario STRIPS will give a superior return due to a greater rolling down effect. At the same time shifting to long duration STRIPS will provide tremendous leverage and performance, whenever a change in monetary policy is anticipated.
5. Tracking theoretical spreads: Anomalies can be detected by tracking the spreads of STRIPS against a theoretical yield curve and appropriate trading strategies could be employed.

(Source: International Bond Investor, Summer 1997)

Annexure II

Sr.no	Stock	Amt O/S (Rs Crore)	Coupon Payment Dates	Interest	Coupon	Coupon amount (Rs Crore)	Minimum Cpn for re-Constitution into Stock of Rs 500	Minimum Cpn for re-constitution into Stock of Rs 1000
1	12.25% 2010	9500.00	2 Jan/Jul	0.1225	0.0613	581.8750	30.6250	61.2500
2	12.30 % 2016	13129.85	2 Jan/Jul	0.1230	0.0615	807.4858	30.7500	61.5000
3	9.39%2011	9000.00	2 Jan/Jul	0.0939	0.0470	422.5500	23.4750	46.9500
4	11% 2006	3000.00	28 Jan/Jul	0.1100	0.0550	165.0000	27.5000	55.0000
5	11.30%2010	9000.00	28 Jan/Jul	0.1130	0.0565	508.5000	28.2500	56.5000
6	11.19 % 2005	11000.00	12 Feb/Aug	0.1119	0.0560	615.4500	27.9750	55.9500
7	10.47%2015	7000.00	12 Feb/Aug	0.1047	0.0524	366.4500	26.1750	52.3500
8	11.57 % 2004	4000.00	25 Mar/Sep	0.1157	0.0579	231.4000	28.9250	57.8500
9	14.00 % 2006	3000.00	25 Mar/Sep	0.1400	0.0700	210.0000	35.0000	70.0000
10	12.15 % 2008	2000.00	25 Mar/Sep	0.1215	0.0608	121.5000	30.3750	60.7500
11	11.10 % 2003	6500.00	7 Apr/Oct	0.1110	0.0555	360.7500	27.7500	55.5000
12	11.99 % 2009	13500.00	7 Apr/Oct	0.1199	0.0600	809.3250	29.9750	59.9500
13	9.90%2005	3000.00	22 Apr/Oct	0.0990	0.0495	148.5000	24.7500	49.5000
14	13.05 % 2007	13000.00	22 Apr/Oct	0.1305	0.0653	848.2500	32.6250	65.2500
15	10.70% 2020	6000.00	22 Apr/Oct	0.1070	0.0535	321.0000	26.7500	53.5000
16	10.25%2021	10000.00	30 May/Nov	0.1025	0.0513	512.5000	25.6250	51.2500
17	9.81 % 2013	11000.00	30 May/Nov	0.0981	0.0491	539.5500	24.5250	49.0500
18	10.95%2011	12000.00	30 May/Nov	0.1095	0.0548	657.0000	27.3750	54.7500
19	12.29%2010	11500.00	29 Jun/Dec	0.1229	0.0615	706.6750	30.7250	61.4500