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Inflation Indexed Bond-A Bond with the Best

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Abstract

Inflation is a dreaded word, the mere mention of which can shake the confidence of economists, investment bankers, policy makers, government as well as investors alike. Sustained inflation makes all of us poorer in the long run. Thrift has not been a rewarding proposition for Indian investors in recent years, as interest rates on debt instruments have failed to keep up with runaway inflation. The introduction of Inflation Indexed Bonds in June this year is much awaited for the small investors as their real return for last few years were in negative zone. Retail investors would be expecting to finally earn positive real returns (excess of returns over inflation rate) from their debt instruments. It is true that these provide hedge against inflation but partially since these are linked to wholesale price index instead of investors' more relevant consumer price index; these do not offer any special tax concessions, towards at the maturity the full benefit could be realized and moreover, the higher bank deposit rates and moderate inflation rate may make these unattractive. This paper intends to analyze the pros and cons of the bond and to suggest the retail investors how to design their portfolio during the high inflation era.

Keywords: WPI; CPI; CAD; RBI; Index Ratio; Settlement Date; Inflation Adjusted Principal

The Context:

For the last two or three years consumers, RBI, policy makers are distressed by the frequent rise in the prices of goods and services of daily requirement. The investors as especially who invest in small saving schemes, banks and in debt instruments too face the heat of deadly inflation, and it is aptly appropriate here to quote the Nobel laureate Milton Friedman who said that, "inflation is one form of taxation that can be imposed without legislation." Inflation is said to occur when most of the prices start rising due to the relative shortage of those goods and services. Inflation is triggered either by a general increase in the demand for goods and services relative to their supply, or by a general fall in the supply of goods and services relative to their demand. The drop in savings from 34 percent to GDP in 2010-11 to 30.8 percent in 2011-12, which points to the impact of inflation. The hike in gold imports since February, 2010, coinciding with the inflation surge suggests that gold is viewed as an anti-inflation hedge. But December quarter of fiscal 2012-13 shows that Current Account Deficit (CAD) touches a record high of 6.7 percent of GDP-thanks to unprecedented import of gold and crude oil. Gold is favored as it is treated as the best inflation-hedged investment avenue along with its high degree of liquidity and relatively negative real return of other traditional investment instruments like bank fixed deposits and bonds or debentures. Gold imports may tapper off once IIBs become popular, bringing funds back into the financial system. Imposing high import duty and putting restrictions on gold

trade by banks may hardly curb the demand for gold unless the investors feel that there is another risk less inflation adjusted product-IIBs available in the market which may be incorporated in their portfolio construction.

Explaining IIBs:

Inflation Indexed Bonds (IIBs) are designed to protect the invested principal from inflation. The return on such bonds linked with the level of inflation or deflation persisting in the economy. Assuming inflation rate 7.5 percent over the next year over the next year if an investor invests ` 1,000 at an annual coupon rate of 1.44 per cent, the investor's amount at maturity will be ` 1,090.48 [(1,000 x 1.075) x 1.44 percent] i.e. interest income will be `90.48. On the other hand, if there is 7.5 per cent deflation prevails the interest will be `13.32 [(1,000 x 0.925) x 1.44 percent]. The bond holder at maturity along with the interest will be repaid the original investment or the revised principal amount, whichever is higher. So, during deflation the quantum of interest may be reduced but keeping the invested principal amount as intact, which implies the capital protection feature of IIB.

Review of Literature:

The galloping effect of inflation on asset prices and to quest to protect the value of investments led to the launch of the first IIB in UK in 1981. Although the pioneer of issuance of an indexed financial instrument was in 1742 by the State of Massachusetts which issued bills linked to the cost of transfer. In India, the first indexed bonds were issued in 1997 which were termed as Capital Indexed Bonds (CIBs) and offered to institutional investors only.

The global scenario of such bonds were linked to WPI for countries such as Argentina (1972-1989), Brazil (1964-1990), Columbia (1967), Finland (1945-1967), Turkey (1994-1997). Countries like USA (1997 &1998), Canada (1995), Japan (2004), Italy, France, Hong Kong, Sweden issued IIBS linked to consumer price index (CPI). The UK issuing IIBs based on retail price index (RPI) which is more volatile than CPI. Australia issuing bonds based on weighted average of eight capital cities. The European countries like Germany and Greece use Harmonized Index of Consumer Prices (HICP) for issue of IIBs.

Rationality of the Study:

For the last few years the small investors who are investing their hard core monies in banks are getting a negative real yield because of twin shocks-high CPI which is persistently close to double digits and moderate nominal fixed deposit annual interest rate of around 8 per cent. The retail investors had no other option but to invest in costlier gold and real estates which relatively give a better result but exposed to externalities. The unprecedented gold spree ballooned the CAD (excess of spending overseas than earnings) to all time high of 6.7 per cent of GDP for the December quarter, 2012-13. RBI had taken a number of steps to discourage the investors from buying yellow metal but responses were poor. To

encourage small and retail investors to invest in inflation hedging products, RBI has introduced IIBs in June, 2013. Since it's a new instrument and investors have little knowledge about the risk-return correlation, they are in dilemma. This study tries to spotlight about the issues involved and to suggest the investors to chalk out their investment plan in the edge of high inflation.

Objectives:

The objectives of the study are:

- To understand the working mechanism of IIBs.
- To find out the rationality behind choosing the WPI as reference index.
- To analyze the comparative performance of IIBs with conventional bonds using WPI as reference index.
- To analyze the comparative returns from IIBs with Bank FDs of high tax paying investors using WPI as reference index.
- To analyze the comparative performance of IIBs with Conventional Bonds and Bank Fixed Deposits (FDs) using CPI as reference index.
- To suggest the investors in the designing of optimum portfolio to maximize returns during inflation.

Research Methodology:

A research methodology provides the empirical and logical basis for drawing conclusions and gaining knowledge (Gupta S.P., 2010). For accomplishing the objectives of the study secondary data have been used. In this present study, WPI and CPI have been taken from the official website of Ministry of Statistics and Project Implementation (MOSPI), RBI website and from the websites of different banks, stock exchanges and companies of India.

Results and Discussions-

A. Working of IIBs:

In the present avatar of IIBs a fixed real coupon (interest) rate decided in the auction which supposed to remain stable during the tenure of the bond i.e. 10 years without considering the inflation rate. The interest is to be paid half yearly basis. Inflation is to be adjusted to the nominal amount of principal. The adjustment factor which is known as *'index ratio'*, will be based on changes in the WPI-to be computed by dividing the reference WPI on the settlement date with the reference WPI on the issue date. *'Settlement dates'* are the dates of payment of interest or repayment of principal amount or the date of trading. If we assume reference WPI on the date of issue of IIBs is 100 and after six months on the due date of first interest payment if it becomes 105, then index factors will be 1.05 (105/100) which will be multiplied by the principal amount to get the *'adjusted principal'*. Interest is to be calculated on the basis of such adjusted principal and to be paid semi-annually. Let us assume that `10,000 have been invested and the auctioned determined annual real rate is 1.70 per cent and WPI is 5 per cent. Then, half yearly amount of interest will be paid as `89.25 [10,000 x 1.05 x 1.70 % x 6/12]. The *'reference WPI'* will be calculated with a lag of

four months period to incorporate any changes so that WPI can be used in the final calculation. Such calculation should be made through statistical interpolation techniques.

B. Rationality of using WPI as Reference Index:

1. ***Null Hypothesis (Ho):*** **There are no significant differences between WPI and CPI in relation to national coverage, timeliness of release and availability in a disaggregate manner.**
2. ***Alternative Hypothesis (H_1):*** **There are significant differences between WPI and CPI in relation to national coverage, timeliness of release and availability in a disaggregate manner.**

We reject the Ho since there are significant differences between the WPI and CPI as reference index. In other words, we accept the alternative hypothesis.

The wholesale price index (WPI) has been chosen by RBI as a *'reference index'* for the pricing of IIBs over CPI for a number of reasons. The WPI consists of prices of primary articles including metals, raw materials, semi-finished products including imported commodities which are traded in the wholesale level, fuels, manufacturing articles but excludes prices of services. An increase in the cost of production eventually leads to a hike in the retail prices (cost-push inflation) paid by the consumers which is likely to get reflected in the WPI then in the CPI, and so, the former is termed as 'headline inflation'. WPI is calculated on a weekly basis and is available with a time lag of only two weeks.

The selection of WPI index over CPI index may be argued on the following grounds-

- ✓ The preference of WPI over CPI is often explained in terms of three criteria-*national coverage, timeliness of release and its availability in a disaggregate format.*
- ✓ The new CPI does not reflect the true impact of inflation as it takes 2010, a high inflationary year as it base year.
- ✓ WPI has been in existence for a long period than CPI, which came into in 2011.
- ✓ From macroeconomic point of view it is obvious that any new financial product to be well accepted initially by wholesale investors and market intermediaries as WPI wide coverage can find maximum number of investors than the CPI indexed based market.
- ✓ The new CPI is disaggregated into rural and urban level besides a combined form. Data for the new series were released starting from January, 2011 but it was useful form 2012 since the two series (rural and urban) were not comparable. Moreover, the CPI makers had not released the pattern of inflation figure reported for each month in 2011 was on year-on-year inflation but an entirely new figure over previous year's average.

C. Comparative Analysis of returns from IIBs with Conventional Bonds using WPI as reference index:

1. ***Null Hypothesis (Ho):*** **There are no significant differences between the returns of IIBs and traditional bonds.**
2. ***Alternative Hypothesis (H_1):*** **There are significant differences between the returns of IIBs and traditional bonds.**

We reject the Ho since there is a significant difference between the returns from IIBs and traditional bonds. In other words, we accept the alternative hypothesis.

From ***Table-1*** in Annexure-I, it is evident that the investors not withstanding their tax brackets are better off in investing in IIBs instead of conventional bonds. The WPI has been assumed as 5 percent with the coupon rate of 1.44 per cent (as per the RBI coupon rate on IIBs) and the tenure of bonds as 10 years; for simplification the WPI, coupon rate was assumed to remain constant over the tenure of the bonds. The investors of IIBs can earn more than 8 per cent as well as 8.5 per cent bonds for the same tenure and without taking any additional risks. The amount at maturity for investors who are in 10 percent tax slab can be more by `3.47 & `1.27 for investing in IIBs instead of investment in 8 per cent and 8.50 per cent bonds respectively. Similarly, the investors of 20 per cent and 30 per cent tax brackets can earn excess by `10.10 and `8.10 for 20 percent post-tax return and `16.67 & `14.92 for 30 percent post-tax return from IIBs in compare to those traditional bonds.

In ***Table -2***, we have assumed that the inflation is increasing in the economy and so WPI has taken 6 per cent keeping other variables as constant like Table -1 analysis. The post- tax return at maturity for all the investors who are in 10, 20 & 30 per cent tax brackets respectively can earn more by investing in IIBs and even their after tax earnings are more by `20.55 & `18.35 for 10 per cent; `27.06 & `25.06 for 20 per cent; `33.55 & `31.80 for 30 per cent tax paying investors.

Findings-

1. Post - tax returns from IIBs are more than that of traditional bonds for all category of tax paying investors.
2. The high tax paying investors can earn relatively more than lower tax paying investors and such increasing trend will continue with the increase in WPI index, ceteris paribus.
3. When inflation increases as measured by WPI index, the post- tax returns from IIBs will also increase as the inflation index and returns are positively correlated. In other words, we can conclude that, *higher the inflation in the economy, higher will be the returns from IIBs; ceteris paribus.*

D. Comparative Analysis of Returns from IIBs with Bank FDs of high tax paying investors using WPI as reference index:

1. ***Null Hypothesis (Ho):*** **There are no significant difference between the returns of IIBs and bank Fixed Deposits (FDs).**
2. ***Alternative Hypothesis (H_1):*** **There are significant differences between the returns of IIBs and traditional bonds.**

We reject the Ho since there are significant differences between the post-tax returns from IIBs and traditional bonds of high tax paying investors. In other words, we accept the alternative hypothesis.

Table-3 Findings-

1. It suggests that all the investors of IIBs who are in 10 per cent tax brackets may not earn more by investing in IIBs instead of investment in Bank FDs.
2. Similarly, all the investors who are in 20 per cent tax slab with the exception of investors in 8 per cent bank FDs can earn more by investing in Bank FDs.
3. The post-tax returns of IIBs for 30 per cent tax bracket investors are more than that of Bank FDs irrespective of the rate of return.
4. The difference in post-tax returns and the rate of returns from Bank FDs have an inverse relation i.e. *higher the rate of return, lower the difference in post-tax returns between IIBs and Bank FDs.*

The following points are noteworthy in this present comparison-

a) Returns: The yield of IIBs is dependent on WPI inflation and these are positively correlated i.e. with a hike in inflation the return will be more and vice versa. Whereas, with the increase in inflation the real return on FD will be decreased, keeping the coupon rate of return as constant.

b) Risk: In its present avatar IIBs are issued by RBI and hence safe and the risk is low. On the other hand, the risk perception for Bank FDs is low up to a certain level i.e. to the extent of `1, 00,000.

c) Liquidity: The IIBs do not have much liquidity as the amount invested is locked in up to the bond tenure which, could improve in near future. The lock in period for Bank FDs and pre-matured withdrawn is allowed.

E. Comparative Analysis of Returns from IIBs with Conventional Bonds and Bank FDs using CPI as reference index:

1. ***Null Hypothesis (Ho):*** **There are no significant differences between the returns of IIBs and Conventional Bonds & Bank FDs.**

2. ***Alternative Hypothesis (H_1):*** **There are significant differences between the returns of IIBs and Traditional Bonds & Bank FDs.**

We reject the Ho since there are significant differences between the post-tax returns from IIBs and traditional bonds of high tax paying investors. In other words, we accept the alternative hypothesis.

Table-4 Findings-

1. The difference in after-tax returns can be seen for all the investors irrespective of tax slabs.
2. The high tax paying investors will enjoy more post- tax interest differentials.
3. There is a negative correlation persist between the rate of interest on Traditional Bonds and the difference in post- tax interest income from IIBs & Traditional Bonds. In other words, *higher the rate of interest on Bank FDs, less the interest differentials.*
4. The post-tax interest differentials reduces as the rate of tax increases, i.e. *higher the tax rate, lower the post-tax interest differentials.*
5. The rate of increase in post-tax returns on Traditional Bonds fall as the tax slab increases.

Table-5 Findings-

1. The difference in after-tax returns can be seen for all the investors irrespective of tax slabs.
2. The post – tax returns diminish as the tax slab increases for both IIBs and Bank FDs. So, it may be concluded that, *higher the tax rates lower the post-tax returns for all investors.*
3. The post-tax returns increase with the hike in the rate of Bank FDs.

F. Designing Optimum Portfolio:

On the savings side, inflation eats into the value of idle cash lying in the bank account. The annual return of 4% can actually have a negative value, thanks to the almost close to double digit inflation. The investors must compute the real rate of return on investments to access inflation impact. FDs, PPF or NSC assure safe returns but are not capable of beating inflation. The various investment options that have an edge over inflation and can deliver positive returns may be the following:

- ***Equities-***

Equity shares are the preferred asset classes for long term wealth creation. Equities have consistently outperformed other asset categories over the long term. For long term investment it is a good option as the average annual return can vary 15 to 20 per cent. Moreover, with the tax benefits on long term capital gains as well as dividends, the real return can be substantial.

- ***Real Estate-***

Small investors can invest in real estate mutual funds as the annual return from this may be anywhere between 6 to 10 per cent and a price appreciation of 5 to 10 per cent is expectable.

- ***Gold-***

Gold as an asset is a natural hedge against inflation and its prices will always stay ahead of inflation. The returns are entirely from capital gains and no regular cash flows. The investors must keep in mind before investing exclusively in the yellow metal that it does not create much wealth creation and its prices are extremely volatile but has easy liquidity and mortgage feature.

- ***Commodities-***

Commodities will always outpace inflation as the latter is a result of rising commodity prices. The savvy investors can deal in commodity futures like metals or crude on commodity exchanges, while the average small investors are in exchange traded funds (ETFs) in the floor of NSE.

- ***Mutual Funds-***

Investors who are risk averse can invest in equities via mutual funds as these are managed by highly skilled professionals and proper allocation of funds in different classes of equities like blue chips, midcaps and small caps along with in debt instruments and gilt funds minimizes the exposure and annual return may vary between 10-15 per cent.

Conclusion:

With the first tranche of IIBs namely the *New Inflation Indexed Government Stock 2023*, in its present form the retail investors will not find much benefit because of many reasons. As of date, the challenge for individual investors is that they are exposed more to CPI rather than WPI and the gap between the two has been widening over the last three years since the prices at the wholesale level have been declining faster than that those at the retail level. What could hurt investors more is that there will be no tax benefit from IIBs. It is only at maturity that the retail investors will realize the full advantage of the inflation protection offered by the instrument. With the rising inflation, the IIBs could offer better returns than a floater with the same coupon rates. So, as it stands, the IIBs are difficult to buy for retail investors, like other government securities. It must be linked to the CPI. It should be keep in mind that the debt instruments in India are always negative for retail investors unless they are willing to assume huge risks.

Annexure:

1. Statement showing Comparative Analysis of Returns of IIBs & Traditional Bonds

(All the figures are in `)

If, WPI =5%

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YEAR	INFLATION INDEXED BONDS(IIBs), WPI- 5%, I=1.44%						Traditional Bonds , *I=8.50%*					Traditional Bonds, *I=8.75%*				
	P	AP	Int.	Int.(post 10% tax)	Int.(post 20% tax)	Int.(post 30% tax)	P	Int.	Int.(post 10% tax)	Int.(post 20% tax)	Int.(post 30% tax)	P	Int.	Int.(post 10% tax)	Int.(post 20% tax)	Int.(post 30% tax)
1	100	105	1.51	1.36	1.21	1.05	100	8.50	7.65	6.80	5.95	100	8.75	7.87	7	6.12
2	100	110.25	1.59	1.43	1.27	1.11	100	8.50	7.65	6.80	5.95	100	8.75	7.87	7	6.12
3	100	115.76	1.67	1.50	1.34	1.16	100	8.50	7.65	6.80	5.95	100	8.75	7.87	7	6.12
4	100	121.55	1.75	1.57	1.40	1.22	100	8.50	7.65	6.80	5.95	100	8.75	7.87	7	6.12
5	100	127.63	1.84	1.65	1.47	1.28	100	8.50	7.65	6.80	5.95	100	8.75	7.87	7	6.12
6	100	134.01	1.93	1.73	1.54	1.35	100	8.50	7.65	6.80	5.95	100	8.75	7.87	7	6.12
7	100	140.71	2.03	1.82	1.62	1.42	100	8.50	7.65	6.80	5.95	100	8.75	7.87	7	6.12
8	100	147.75	2.13	1.91	1.70	1.49	100	8.50	7.65	6.80	5.95	100	8.75	7.87	7	6.12
9	100	155.13	2.23	2.00	1.78	1.56	100	8.50	7.65	6.80	5.95	100	8.75	7.87	7	6.12
10	100	162.89	2.35	2.11	1.88	1.64	100	8.50	7.65	6.80	5.95	100	8.75	7.87	7	6.12
TOTAL	--	--	19.02	17.08	15.21	13.28	--	85.00	76.50	68.00	59.50	--	87.50	78.70	70.00	61.25
Amt. at Maturity			(162.89+19.02) =***181.91***	(162.89+17.08) =***179.97***	(162.89+13.28) =***178.10***	(162.89+13.28) =***176.17***		(100+85) =***185***	(100+76.50) =***176.50***	(100+68) =***168***	(100+59.50) =***159.50***		(100+87.50) =***187.50***	(100+78.70) =***178.70***	(100+70) =***170***	(100+61.25) =***161.25***

Assumed: Principal Amount =` 100, Tenure: 10 years, Wholesale Price Index **(WPI) =5%**, Coupon/Interest rate on IIB= 1.44 %, (Source: RBI) Traditional Bonds' interest rate= 8.50% & 8.75% (Source: Company websites) respectively [For individual investors other than senior and super senior citizens]. P= ***Principal Amount***, AP= ***Adjusted Principal***, Int. = ***Interest.***

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2. Statement showing Comparative Analysis of Returns of IIBs & Traditional Bonds

If, WPI =6%

(All the figures are in `)

YEAR	INFLATION INDEXED BONDS(IIBs), *WPI- 6%, I=1.44%*						Traditional Bonds , *I=8.50%*					Traditional Bonds, *I=8.75%*				
	P	AP	Int.	Int.(post 10% tax)	Int.(post 20% tax)	Int.(post 30% tax)	P	Int.	Int.(post 10% tax)	Int.(post 20% tax)	Int.(post 30% tax)	P	Int.	Int.(post 10% tax)	Int.(post 20% tax)	Int.(post 30% tax)
1	100	106	1.52	1.36	1.21	1.06	100	8.50	7.65	6.80	5.95	100	8.75	7.87	7	6.12
2	100	112.36	1.61	1.44	1.28	1.12	100	8.50	7.65	6.80	5.95	100	8.75	7.87	7	6.12
3	100	119.10	1.71	1.53	1.36	1.19	100	8.50	7.65	6.80	5.95	100	8.75	7.87	7	6.12
4	100	126.24	1.81	1.62	1.44	1.26	100	8.50	7.65	6.80	5.95	100	8.75	7.87	7	6.12
5	100	133.81	1.92	1.73	1.53	1.34	100	8.50	7.65	6.80	5.95	100	8.75	7.87	7	6.12
6	100	141.83	2.04	1.83	1.63	1.42	100	8.50	7.65	6.80	5.95	100	8.75	7.87	7	6.12
7	100	150.34	2.16	1.94	1.73	1.51	100	8.50	7.65	6.80	5.95	100	8.75	7.87	7	6.12
8	100	159.36	2.29	2.06	1.83	1.60	100	8.50	7.65	6.80	5.95	100	8.75	7.87	7	6.12
9	100	168.92	2.43	2.18	1.94	1.70	100	8.50	7.65	6.80	5.95	100	8.75	7.87	7	6.12
10	100	179.05	2.57	2.31	2.05	1.80	100	8.50	7.65	6.80	5.95	100	8.75	7.87	7	6.12
Total	--	--	20.06	18.00	16.00	14.00	--	85.00	76.50	68.00	59.50	--	87.50	78.70	70.00	61.25
Amount of Maturity			(179.05 +20.06) =***199.11***	(79.05+18) =***197.05***	(179.05+16) =***195.05***	(179.05+14) =***193.05***		(100+85) =***185***	(100+76.50) =***176.50***	(100+68) =***168***	(100+59.50) =***159.50***		(100+87.50) =***187.50***	(100+78.70) =***178.70***	(100+70) =***170***	(100+61.25) =***161.25***

Assumed: Principal Amount =` 100, Tenure: 10 years, Wholesale Price Index **(WPI) =6%,** Coupon/Interest rate on IIB= 1.44 %, (Source: RBI) Traditional Bonds' interest rate= 8.50% & 8.75%

(Source: Company websites) respectively [For individual investors other than senior and super senior citizens]. P= ***Principal Amount***, AP= ***Adjusted Principal***, Int. = ***Interest.***

3. Comparative Analysis of Returns of IIBs & Bank Fixed Deposits (FDs)

(All the figures are in `)

8% FD				8.50% FD				8.75% FD				9% FD				9.25% FD			
AMOUNT	POST 10% TAX	POST 20% TAX	POST 30% TAX	AMOUNT	POST 10%	POST 20%	POST 230%	AMOUNT	POST 10%	POST 20%	POST 30%	AMOUNT	POST 10%	POST 20%	POST 30%	AMOUNT	POST 10%	POST 20%	POST 30% TAX
220.80	***198.72***	***176.64***	***154.56***	231.89	***208.70***	***185.51***	***162.32***	237.63	***213.86***	***190.10***	***166.34***	243.51	***219.16***	***194.80***	***170.45***	249.54	***224.58***	***199.63***	***174.67***

WPI=5% **(All the figures are in `)**

YEAR	INFLATION INDEXED BONDS(IIBs), *WPI- 5%, I=1.44%*					
	P	**AP**	**Int.**	**Int.(post 10% tax)**	**Int.(post 20% tax)**	**Int.(post 30% tax)**
1	100	105	1.51	1.36	1.21	1.05
2	100	110.25	1.59	1.43	1.27	1.11
3	100	115.76	1.67	1.50	1.34	1.16
4	100	121.55	1.75	1.57	1.40	1.22
5	100	127.63	1.84	1.65	1.47	1.28
6	100	134.01	1.93	1.73	1.54	1.35
7	100	140.71	2.03	1.82	1.62	1.42
8	100	147.75	2.13	1.91	1.70	1.49
9	100	155.13	2.23	2.00	1.78	1.56
10	100	162.89	2.35	2.11	1.88	1.64
Total	--	--	19.02	17.08	15.21	13.28
Amt. at Maturity			(162.89 +19.02) =***181.91***	(162.89+17.08) =***179.97***	(162.89+13.28) =***178.10***	(162.89+13.28) =***176.17***

WPI=6% **(All the figures are in `)**

YEAR	INFLATION INDEXED BONDS(IIBs), WPI- 6%, *I=1.44%*					
	P	**AP**	**Int.**	**Int.(post 10% tax)**	**Int.(post 20% tax)**	**Int.(post 30% tax)**
1	100	106	1.52	1.36	1.21	1.06
2	100	112.36	1.61	1.44	1.28	1.12
3	100	119.10	1.71	1.53	1.36	1.19
4	100	126.24	1.81	1.62	1.44	1.26
5	100	133.81	1.92	1.73	1.53	1.34
6	100	141.83	2.04	1.83	1.63	1.42
7	100	150.34	2.16	1.94	1.73	1.51
8	100	159.36	2.29	2.06	1.83	1.60
9	100	168.92	2.43	2.18	1.94	1.70
10	100	**179.05**	2.57	2.31	2.05	1.80
Total	--	--	**20.06**	**18.00**	**16.00**	**14.00**
Amt. at Maturity			**(179.05+20.06) =*199.11***	**(79.05+18) =*197.05***	**(179.05+16) =*195.05***	**(179.05+14) =*193.05***

Assumed: Principal Amount =` 100, Tenure: 10 years, Wholesale Price Index **(WPI) =5% & 6%,** Coupon/Interest rate on IIB= 1.44 %,(Source: RBI) Bank Fixed Deposit interest rate= 8.50% & 8.75% (Source: Bank websites) respectively [For individual investors]. P= ***Principal Amount***, AP= ***Adjusted Principal***, Int. = ***Interest.***

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4. Statement showing Comparative Analysis of Returns of IIBs & Traditional Bonds

(All the figures are in `)

If, CPI=9.31%

YEAR	INFLATION INDEXED BONDS(IIBs), CPI- 9.31%, I=1.44%						Traditional Bonds , *I=8.50%*					Traditional Bonds, *I=8.75%*				
	P	AP	Int.	Int.(post 10% tax)	Int.(post 20% tax)	Int.(post 30% tax)	P	Int.	Int.(post 10% tax)	Int.(post 20% tax)	Int.(post 30% tax)	P	Int.	Int.(post 10% tax)	Int.(post 20% tax)	Int.(post 30% tax)
1	100	109.31	1.57	1.41	1.26	1.09	100	8.50	7.65	6.80	5.95	100	8.75	7.87	7	6.12
2	100	119.48	1.72	1.55	1.37	1.20	100	8.50	7.65	6.80	5.95	100	8.75	7.87	7	6.12
3	100	130.60	1.88	1.69	1.50	1.32	100	8.50	7.65	6.80	5.95	100	8.75	7.87	7	6.12
4	100	142.75	2.05	1.84	1.64	1.43	100	8.50	7.65	6.80	5.95	100	8.75	7.87	7	6.12
5	100	156.04	2.25	2.02	1.80	1.57	100	8.50	7.65	6.80	5.95	100	8.75	7.87	7	6.12
6	100	170.56	2.45	2.20	1.96	1.71	100	8.50	7.65	6.80	5.95	100	8.75	7.87	7	6.12
7	100	186.43	2.68	2.41	2.14	1.87	100	8.50	7.65	6.80	5.95	100	8.75	7.87	7	6.12
8	100	203.78	2.93	2.63	2.34	2.05	100	8.50	7.65	6.80	5.95	100	8.75	7.87	7	6.12
9	100	222.75	3.20	2.88	2.56	2.24	100	8.50	7.65	6.80	5.95	100	8.75	7.87	7	6.12
10	100	243.48	3.50	3.15	2.80	2.45	100	8.50	7.65	6.80	5.95	100	8.75	7.87	7	6.12
TOTAL	--	--	24.23	21.78	19.37	16.93	--	85.00	76.50	68.00	59.50	--	87.50	78.70	70.00	61.25
Amt. at Maturity			(243.48+24.23) =***267.71***	(243.48+21.78)=***265.26***	(243.48+19.37)=***262.85***	(243.48+16.93)=***260.41***		(100+85) =***185***	(100+76.50) =***176.50***	(100+68) =***168***	(100+59.50) =***159.50***		(100+87.50) =***187.50***	(100+78.70) =***178.70***	(100+70) =***170***	(100+61.25) =***161.25***

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Assumed: Principal Amount =` 100, Tenure: 10 years, Consumer Price Index **(CPI) =9.31%** for May, 2013(**source: MOSPI**), Coupon/Interest rate on IIB= 1.44 %(Source: RBI), Traditional Bonds interest rate= 8.50% & 8.75 % (Company websites) respectively. P= ***Principal Amount***, AP= ***Adjusted Principal***, Int. = ***Interest.5***

5. Comparative Analysis of Returns of IIBs & Bank Fixed Deposits (FDs)

(All the figures are in `)

8% FD				8.50% FD				8.75% FD				9% FD				9.25% FD			
AMOUNT	POST 10% TAX	POST 20% TAX	POST 30% TAX	AMOUNT	POST 10% TAX	POST 20% TAX	POST 230% TAX	AMOUNT	POST 10% TAX	POST 20% TAX	POST 30% TAX	AMOUNT	POST 10% TAX	POST 20% TAX	POST 30% TAX	AMOUNT	POST 10% TAX	POST 20% TAX	POST 30% TAX
220.80	***198.72***	***176.64***	***154.56***	231.89	***208.70***	***185.51***	***162.32***	237.63	***213.86***	***190.10***	***166.34***	243.51	***219.16***	***194.80***	***170.45***	249.54	***224.58***	***199.63***	***174.67***

If, CPI=9.31% **(All the figures are in `)**

YEAR	INFLATION INDEXED BONDS(IIBs), CPI- 9.31%, I=1.44%					
	P	AP	Int.	Int.(post 10% tax)	Int.(post 20% tax)	Int.(post 30% tax)
1	100	109.31	1.57	1.41	1.26	1.09
2	100	119.48	1.72	1.55	1.37	1.20
3	100	130.60	1.88	1.69	1.50	1.32
4	100	142.75	2.05	1.84	1.64	1.43
5	100	156.04	2.25	2.02	1.80	1.57
6	100	170.56	2.45	2.20	1.96	1.71
7	100	186.43	2.68	2.41	2.14	1.87
8	100	203.78	2.93	2.63	2.34	2.05
9	100	222.75	3.20	2.88	2.56	2.24
10	100	243.48	3.50	3.15	2.80	2.45
TOTAL	--	--	24.23	21.78	19.37	16.93

Amt. at Maturity		(243.48+24.23)= ***267.71***	(243.48+21.78)= ***265.26***	(243.48+19.37)= ***262.85***	(243.48+16.93)= ***260.41***

Assumed: Principal Amount =` 100, Tenure: 10 years, Consumer Price Index **(CPI) =9.31%** for May, 2013(**source: MOSPI**), Coupon/Interest rate on IIB= 1.44 %(Source: RBI), Bank Fixed Deposit rate= 8.50% & 8.75 %(Bank websites) respectively [For individual investors other than senior and super senior citizens). P= ***Principal Amount***, AP= ***Adjusted Principal***, Int. = ***Interest.***

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