

**INFLATION INDEXED BONDS- HISTORY AND COMPARATIVE  
STUDY ON RETURNS OF INFLATION INDEXED BONDS  
WITH FIXED DEPOSITS FROM BANKS, CORPORATE BONDS  
AND GOVERNMENT SECURITIES**

**O.N.SRIVASTAVA**

Assistant General Manager & Faculty, State Bank Staff College,  
Begumpet, Hyderabad

**Abstract:**

*Inflation adversely affects the value of return on investments. Inflation Indexed Bonds (ILBs) ensure to insulate the value of periodical returns as well as original investment from the inflationary effects in the periods of rising inflation. Present study traces the history of Inflation Linked Instruments issued globally and also makes an attempt to compare the return on various investment available in the Indian Financial Market, over an extended period, to prove the superiority of Inflation Indexed Bonds over other investment avenues.*

**KEYWORDS:**

Bonds- History , Corporate Bonds , Inflation Indexed Bonds , globally.

**INTRODUCTION**

Inflation Indexed Bonds (ILBs) are bonds where the principal and interest is indexed to inflation. They are thus designed to minimize the inflation risk of an investment. The first known inflation indexed bond was issued by Massachusetts Bay Company in 1780. The market has grown dramatically since the British Government began issuing inflation linked gilts in 1981. The inflation-linked bonds constituting a small portion of the market. Inflation indexed bonds pay a periodic coupon that is equal the product of inflation index and the nominal coupon rate.

**HISTORY OF INFLATION-LINKED BOND:**

Inflation-Linked Bonds(ILBs) were first developed in the 18th century to combat inflation's corrosive effects on the real value of consumer goods such as beef, clothing, shoes and other essential items during the times of rising prices. The Massachusetts Bay Company sold the bonds beginning in 1780s, but all that time in history few investors were interested. However, following the rapid economic expansion after World War II, the concept of inflation-linked bond caught the attention of government financial planners. Iceland issued ILBs in early 1950s to combat high inflation. Thirty years later, in early 1980s, the modern Inflation Linked Bonds market began in earnest when Great Britain began to issue ILBs, or "Linkers", as they are often called in the United Kingdom. Other countries followed suit including Canada, Sweden, Australia, and United States.

**GLOBALISSUANCE OF INFLATION LINKED BONDS:**

A large number of countries in the world have issued Inflation-Linked Instruments:

INFLATION INDEXED BONDS- HISTORY AND COMPARATIVE STUDY ON RETURNS.....

Country	Issure	Inflation Index
United States	US Treasury	US Consumer Price Index
United Kingdom	UK Debt Management Office	Retail Price Index (RPI)
United Kingdom	National Savings and Investments	Retail Price Index (RPI)
France	Agence France Tresor	France CPI ex-tobacco (OATi), EU HICP ex-tobacco (OATEi)
Canada	Bank of Canada	Canada All-Items CPI
Australia	Department of the Treasury (Australia)	Weighted Average of Eight Capital Cities: All Groups Index
Germany	Bundesrepublik Deutschland Finanzagentur	EU HICP ex Tobacco
Hong Kong	Hong Kong Government	Composite Consumer Price Index
Italy	Department of the Treasury	EU HICP ex Tobacco
Italy	Department of Treasury	Italy CPI ex tobacco
India	Reserve Bank of India	Wholesale Price Index
Japan	Ministry of Finance (Japan)	Japan CPI (nationwide, ex-fresh-food)
Sweden	Swedish National Debt Office	Swedish CPI

In terms of liquidity, the most liquid instruments are Treasury Inflation-Protected Securities(TIPS), issued by US Treasury. The other important inflation-linked markets are the UK Index-Linked Gilts and the French OATi/OATEi.

**RATIONAL FOR ISSUING INFLATION INDEXED BONDS:**

Inflation has a dampening effect on investment returns and can cut deeply into investment return value if there is no offset for the inflationary risk. If one has a portfolio, for example, that returns 10%, but the inflation rate is 5%, the true value of the returns has been cut by about 50%. Inflation-linked bonds, however, can help to offset or hedge that risk because they increase in value during inflationary periods.

Globally inflation has not been major macroeconomic factor in the recent past, but it may become major a factor in future. Inflation-Linked Bonds are more popular than ever as a hedge against an uncertain future. The United States, Canada, Japan and a wide range of European countries, all issue inflation-linked bonds and these have become a popular long-range planning investment vehicle for individuals and institutions alike.

**HOW INFLATION-LINKED BONDS WORK:**

Inflation-linked bonds (ILBs) operate in a manner much like when they were first issued by the Massachusetts Bay Company more than 200 years ago. The primary difference, however, is that they are now issued by governments rather than companies. ILBs are still tied to the cost of consumer goods, such as the consumer price index (CPI). Each country has its own method for calculating those values on a regular basis and has its own agency responsible for issuing inflation-linked bonds. In the United States, TIPS and I-Bonds are tied to the value of the United States' CPI and sold by the Treasury, while inflation-linked gilts are issued by the U.K. Debt Management Office and link to that country's retail priced index (RPI). The

#### **INFLATION INDEXED BONDS- HISTORY AND COMPARATIVE STUDY ON RETURNS.....**

Bank of Canada issues that nation's real return bonds, which are tied to the Canada All-Items CPI inflation index, while Japan's Ministry of Finance's inflation-linked bonds are tied to the Japanese CPI.

In general, for ILBs issued in every country, the outstanding principal of the bond rises with inflation. So, when inflation rises, so does the face, or par, value of the bond. This is in contrast to the inflationary trend with general securities which decrease in value when inflation rises. In addition, once the par value adjusts in relation to the cost of the price of goods, the interest paid out by the bonds is also adjusted for inflation. By providing these features, ILBs are able to blunt the real impact of inflation felt by the holder of the bonds.

#### **Risk in Inflation-Linked Bonds:**

While inflation-linked bonds have considerable upside potential, they also possess certain risks. Their value tends to fluctuate not just with the adjustments in the CPI/WPI to which they are tied, but also with the rise and fall of interest rates. During deflationary periods, the rate of return for ILBs tends to be less than other bond categories. TIPS, I-Bonds and many of their global inflation-linked counterparts do not have much value protection during times of deflation. The U.S. Treasury, however, does have a protection floor for TIPS : \$ 1,000 in par value- the lowest value that the U.S. government will allow it to be redeemed for. Similarly Inflation Indexed Bonds issued by RBI have protection against deflation as face value of the IIB will be protected even during the period of deflation.

#### **Inflation Indexed Bonds Issued in India :**

Reserve Bank of India (RBI) has recently issued Inflation Indexed Bonds (IIBs) in two tranches on 4 June, 2013 and on 25 June, 2013 (i. WPI+1.49% ii. WPI+1.99%), which are indexed to Whole Sale Price Index (WPI), as a means to provide a financial instrument which can act as a hedge against inflation. These bonds are an enhanced version of capital indexed bonds issued in 1997. Capital indexed bonds provided inflation protection only for the principal while Inflation Indexed Bonds (ILBs) provide inflation protection for interest payments as well. A normal government security bond carries an inflation risk which the inflation indexed bonds are free from. After the initial auction, inflation indexed bonds are traded in the secondary markets.

#### **Difference between inflation indexed bonds and other fixed income products:**

Inflation risk has been a potential problem with fixed income securities, especially with the fixed maturity products. If the inflation rate is higher than the interest rate received on the fixed income products, it diminishes the purchasing power of the consumer. Inflation indexed bonds are an efficient way to counter the inflation risk. Then main difference between fixed deposits and inflation indexed bonds in the principal adjustment and interest payment. In case of a fixed deposit, a pre-defined static interest rate is mentioned and at the end of the tenure an investor can withdraw the invested amount along with the interest rate accumulated. In case of inflation indexed bonds, the principal is adjusted to wholesale price index (WPI) and a fixed coupon rate or interest rate is paid on the periodically adjusted principal amount. Adjusted principal amount is redeemed in the final year.

#### **Comparison of return on Inflation Indexed Bonds vis-à-vis Bank Fixed Deposits, Corporate Bonds and Govt. Securities:**

For the purpose of the present study we have taken notional principal amount of Rs. 1000 and calculated the return on ILBs and three investment instruments, Fixed Deposits (one year period) in Bank. AAA rated Corporate Bonds and Govt. Securities for a period of 9 years beginning from 2005 (starting year) to 2013 (final year when redemption of the security instrument has been presumed). We have chosen base year 2005 as it is from this year that new WPI series has been introduced and consistent data on WPI are available for comparison. The rates of Whole Sale Price Index, Rate of interest payable on Bank deposits and return on Government Securities have been obtained from official sites on respective Govt. Departments/Banks. The returns have been calculated on Pre-Tax and Post Tax basis.

#### **A-PRE TAX RETURNS :**

##### **i. INFLATION INDEXED BONDS- WPI+1.99% SERIES**

**INFLATION INDEXED BONDS- HISTORY AND COMPARATIVE STUDY ON RETURNS.....**

Amount Invested- 10000      Year -2005      Inflation Index- 100

S.No.	Year	Inflation Index	Adjusted Principal	Inflation	Rate of interest	Interest	Total Return =Interest+ Increase in Principal in 9 <sup>th</sup> year
1	2005	100	1000	0	1.99	19.9	19.90
2	2006	104.47	1044.7	4.47	6.46	67.49	67.49
3	2007	111.35	1113.5	6.59	8.58	95.49	95.49
4	2008	116.63	1166.3	4.47	6.73	78.51	78.51
5	2009	126.02	1260.2	8.05	10.04	126.54	126.54
6	2010	130.81	1308.1	3.80	5.79	75.75	75.75
7	2011	143.32	1433.2	9.56	11.55	165.58	165.58
8	2012	156.83	1568.3	9.43	11.42	179.04	179.04
9	2013	167.62	1676.2	6.88	8.87	148.68	824.88*
			<b>Total Return</b>				<b>1633.19</b>

\*This includes the repayment of increased Principal amount of Rs. 676.20 and periodic interest of Rs. 148.68.

**Average Yield over the period = 18.15%**

**i. INFLATION INDEXED BONDS-WPI+1.44% SERIES**

Amount Invested- 1000      Year -2005      Inflation Index- 100

S.No.	Year	Inflation Index	Adjusted Principal	Inflation	Rate of interest	Interest	Total Return =Interest+ Increase in Principal in 9 <sup>th</sup> year
1	2005	100	1000	0	1.44	14.4	14.4
2	2006	104.47	1044.7	4.47	5.91	61.74	61.74
3	2007	111.35	1113.5	6.59	8.03	89.37	89.37
4	2008	116.63	1116.3	4.74	6.18	72.10	72.10
5	2009	126.02	1260.2	8.05	9.49	119.61	119.61
6	2010	130.81	1308.1	3.80	5.24	68.56	68.56
7	2011	143.32	1433.2	9.56	11.00	157.70	157.70
8	2012	156.83	1568.3	9.43	10.87	170.42	170.42
9	2013	167.62	1676.2	6.88	8.32	139.46	815.66*
			<b>Total Return</b>				<b>1569.55</b>

\*This includes the repayment of increased Principal amount of Rs. 676.20 and periodic interest of Rs.

**INFLATION INDEXED BONDS- HISTORY AND COMPARATIVE STUDY ON RETURNS.....**

139.46.

**Average Yield over the period = 17.44%**

**i.BANK FIXED DEPOSITS (ONE YEAR)**

Amount Invested-1000 Year -2005 Rate of interest-Fixed Deposit rate for one year

S.No.	Year	Rate of interest (one year Fixed Deposit)	Adjusted Principal	Interest	Total Return = Interest on increased Principal*
	2005	6	1060	60	60.00
	2006	6.25	1126.25	66.25	66.25
	2007	8.25	1219.17	92.92	92.92
	2008	7.5	1310.60	91.44	91.44
	2009	8.5	1422.00	111.40	111.40
	2010	6	1507.32	85.32	85.32
	2011	8.25	1631.68	124.35	124.35
	2012	9	1778.53	146.85	146.85
	2013	8.75	1934.15	155.62	155.62*
				<b>Total Return</b>	<b>934.15</b>

\*It is presumed that annual interest is invested in one year deposit at the prevalent rate.

**Average Yield over the period = 10.38%**

**i.AAA RATED CORPORATE BONDS (TEN YEAR)**

Amount Invested- 1000 Year -2005 Rate of interest- 7.2%

S.No.	Year	Rate of interest	Adjusted Principal	Interest	Total Return =Interest on increased Principal*
1	2005	7.2	1000	72	72
2	2006	7.2	1072	77.18	77.18
3	207	7.2	1149.18	82.74	82.74
4	2008	7.2	1231.93	88.70	88.70
5	2009	7.2	1320.62	95.08	95.08
6	2010	7.2	1415.71	101.93	101.93
7	2011	7.2	1517.64	109.27	109.27
8	2012	7.2	1626.91	117.14	117.14
9	2013	7.2	1744.05	125.57	125.57
				<b>Total Return</b>	<b>869.62</b>

**INFLATION INDEXED BONDS- HISTORY AND COMPARATIVE STUDY ON RETURNS.....**

\*It is presumed that annual interest is invested in one year deposit at the prevalent rate.

**Average Yield over the period = 9.66%**

**i.GOVERNMENT SECURITIES (TEN YEAR)**

Amount Invested- 1000      Year -2005      Rate of interest- 6.2%

<b>S.No.</b>	<b>Year</b>	<b>Rate of interest</b>	<b>Adjusted Principal</b>	<b>Interest</b>	<b>Total Return =Interest on increased Principal*</b>
1	2005	6.2	1000	62	62
2	2006	6.2	1062	65.84	65.84
3	2007	6.2	1127.84	69.93	69.93
4	2008	6.2	1197.77	74.26	74.26
5	2009	6.2	1272.03	78.87	78.87
6	2010	6.2	1350.90	83.76	83.76
7	2011	6.2	1434.65	88.95	88.95
8	2012	6.2	1523.60	94.46	94.46
9	2013	6.2	1618.07	100.32	100.32
				Total Return	718.39

\* It is presumed that annual interest is invested in one year deposit at the prevalent rate.

**Average Yield over the period= 7.98%**

**GRAPHICAL PRESENTATION OF RETURN-SUMMARY**

The above calculations suggest that Inflation indexed Bonds offered superior returns in comparison to Fixed Deposits from Banks, AAA Rated Corporate Bonds and Ten Year Government Securities.

**B-POST TAX RETURNS :**

**i.INFLATION INDEXED BONDS-WPI+1.99% SERIES**

Amount Invested-1000      Year -2005      Inflation Index- 100

INFLATION INDEXED BONDS- HISTORY AND COMPARATIVE STUDY ON RETURNS.....

Sr. No.	Year	Inflation Index	Total return (10% Tax)	Total return (20% Tax)	Total return (30% Tax)
1	2005	100	17.91	15.92	13.93
2	2006	104.47	60.74	53.99	47.24
3	2007	11.35	85.94	76.39	66.84
4	2008	116.63	70.66	62.81	54.96
5	2009	126.02	113.88	101.23	88.58
6	2010	130.81	68.18	60.60	53.03
7	2011	143.32	149.03	132.47	115.91
8	2012	156.83	161.14	143.24	125.33
9	2013	167.62	742.39*	659.90*	577.42*
		<b>Total Return</b>	<b>1469.87</b>	<b>1306.55</b>	<b>1143.23</b>
		<b>Average Yield over the period</b>	<b>16.33</b>	<b>14.52</b>	<b>12.70</b>

\*Though Long Term Capital Gain ( on the Principal amount ) of Rs. 676.20 will be taxed after indexation @ 20%, we have for the sake simplicity, calculated tax on the Long term Capital Gain at the slap rate only.

ii. INFLATION INDEXED BONDS-WPI+1.44%SERIES

Amount Invested- 1000      Year-2005      Inflation Index-100

Sr. No.	Year	Inflation Index	Total return (10% Tax)	Total return (20% Tax)	Total return (30% Tax)
1	2005	100	12.96	11.52	10.08
2	2006	104.47	55.57	49.39	43.22
3	2007	111.35	80.43	71.49	62.56
4	2008	116.63	64.89	57.68	50.47
5	2009	126.02	107.65	95.69	83.72
6	2010	130.81	61.70	54.85	47.99
7	2011	143.32	141.93	126.16	110.39
8	2012	156.83	153.38	136.33	119.29
9	2013	167.62	734.09	652.53	570.96
		<b>Total Return</b>	<b>1412.60</b>	<b>1255.64</b>	<b>1098.69</b>
		<b>Average Yield over the period</b>	<b>15.70</b>	<b>13.95</b>	<b>12.21</b>

\*Though Long Term Capital Gain (on the Principal amount) of Rs. 676.20 will be taxed after indexation @ 20%. We have for the sake simplicity, calculated tax on the Long term Capital Gain at the slab rate only.

iii. BANK FIXED DEPOSITS (ONE YEAR)

**INFLATION INDEXED BONDS- HISTORY AND COMPARATIVE STUDY ON RETURNS.....**

Amount Invested-1000 Year 2005 Rate of interest-Fixed Deposit rate for one year

Sr. No.	Year	Rate of interest (one year Fixed Deposits)	Total return (10% Tax)	Total return (20% Tax)	Total return (30% Tax)
1	2005	6	54	48	42
2	2006	6.25	59.63	53	46.38
3	2007	8.25	83.62	74.33	65.04
4	2208	7.5	82.29	73.15	64.01
5	2009	8.5	100.26	89.12	77.98
6	2010	6	76.79	68.26	59.72
7	2011	8.25	111.92	99.26	87.05
8	2012	9	132.17	117.48	102.80
9	2013	8.75	140.06	124.50	108.93
		<b>Total Return</b>	<b>840.74</b>	<b>747.32</b>	<b>653.91</b>
		<b>Average Yield over the period</b>	<b>9.34</b>	<b>8.30</b>	<b>7.27</b>

**iv. AAARATED CORPORATE BONDS (TEN YEAR)**

Amount Invested-1000 Year-2005 Rate of interest- 7.2%

Sr. No.	Year	Rate of interest	Total return (10% Tax)	Total return (20% Tax)	Total return (30% Tax)
1	2005	7.2	64.8	57.6	50.4
2	2006	7.2	69.47	61.75	54.03
3	2007	7.2	74.47	66.19	57.92
4	2208	7.2	79.83	70.96	62.09
5	2009	7.2	85.58	76.07	66.56
6	2010	7.2	91.74	81.54	71.35
7	2011	7.2	98.34	87.42	76.49
8	2012	7.2	105.42	93.71	82.00
9	2013	7.2	113.01	100.46	87.90
		<b>Total Return</b>	<b>782.66</b>	<b>595.24</b>	<b>520.83</b>
		<b>Average Yield over the period</b>	<b>8.70</b>	<b>6.61</b>	<b>6.51</b>



**INFLATION INDEXED BONDS- HISTORY AND COMPARATIVE STUDY ON RETURNS.....**

**i.GOVERNMENT SECURITIES (TEN YEAR)**

Amount Invested-1000      Year-2005      Rate of interest- 6.2%

Sr. No.	Year	Rate of interest	Total return (10% Tax)	Total return (20% Tax)	Total return (30% Tax)
1	2005	6.2	55.8	49.6	43.30
2	2006	6.2	59.26	52.68	46.09
3	2007	6.2	62.93	55.94	48.95
4	2008	6.2	66.84	59.41	51.98
5	2009	6.2	70.98	63.09	55.21
6	2010	6.2	75.38	67.00	58.63
7	2011	6.2	80.05	71.16	62.26
8	2012	6.2	85.02	75.57	66.12
9	2013	6.2	90.29	80.26	70.22
		<b>Total Return</b>	<b>646.55</b>	<b>574.71</b>	<b>502.87</b>
		<b>Average Yield over the period</b>	<b>7.18</b>	<b>6.39</b>	<b>5.59</b>

**GRAPHICAL PRESENTATION OF RETURN- SUMMARY**

**CONCLUSION:**

Though the coupon payment on Inflation Indexed Bonds is lower as compared to Corporate Bonds, Govt. Securities and interest on Bank Fixed Deposits but the adjustment of Principal amount for inflation in case of Inflation Indexed Bonds more than compensates the lower coupon rate. Further, lower tax rate on the Long Term Capital Gain on the Principal amount brings in an overall superior return on Inflation Indexed Bonds as compared to other investment securities available in the market.

**BIBLIOGRAPHY :**

- i. Deacon, Mark, Andrew Derry, and Dariush Mirfendereski; Inflation-Indexed Securities: Bonds, Swaps and Other Derivatives (end edition, 2004) Wiley Finance
- ii. Bhansali, Jayesh D., 1998. "Inflation-indexed U.S. Treasury Bonds: An Analysis." Journal of Investing
- iii. Barclays Capital 2001. US Inflation-Indexed Securities. April.
- iv. Bodie, Zvi, 1990. "Inflation, Indexed-Lined Bonds and Asset Allocation." Journal of Portfolio Management. Winter: pp.48-53.
- v. Brynjolfsson and Frank J. Fabozzi, eds. Handbook of Inflation Indexed Bonds. New Hope, P.A.: Frank J. Fabozzi Associates. Chapter 11.
- vi. www.rbi.org- FAQ on Inflation Indexed Bonds
- vii. Livemint-dated June, 04, 2013 and June, 25, 2013
- viii. www.eaindustry.nic.in
- ix. CRISIL FUND INSIGHTS- Volume 29 September 2013