



## A STUDY ON PERFORMANCE EVALUATION OF SELECTED CORPORATE BONDS

**Smt. Mamatha GM**

Research Scholar, Department of Studies in Commerce, Vijayanagara Sri Krishnadevaraya University, Inana Sagara, Ballari-583105

**Prof. Bheemanagouda**

Department of Studies in Commerce, Vijayanagara Sri Krishnadevaraya University, Inana Sagara, Ballari-583105

**ABSTRACT**

The realm of corporate bond investments plays a pivotal role in the broader financial landscape, influencing investors, corporations and market as a whole. This study delves into the performance evaluation of selected corporate bonds, emphasizing the need for a robust understanding of their financial dynamics. Corporate bonds serve as crucial instruments for both issuers and investors, bridging capital requirements and portfolio diversification. As global financial markets continue to evolve, the assessment of corporate bond performance becomes imperative for informed decision-making. The study conducts a comprehensive performance evaluation of selected corporate bonds, employing various financial metrics and analytical tools. The bonds under considerations are sourced from diverse sectors, aiming to provide a nuanced understanding of their financial viability. By analysing key indicators such as annualized returns, risk profiles, and Sharpe ratios, the research sheds light on the relative performance of these bonds. The study extends its analysis to encompass specific, systematic and total risk assessments, thereby offering valuable insights for investors and financial practitioners. The findings contribute to the ongoing discourse on corporate bond investments, particularly in terms of risk-adjusted returns.

**KEYWORDS :** Corporate Bonds, Specific Risk, Systematic Risk, Sharpe Ratio, Alpha Beta.**INTRODUCTION**

The Indian corporate bond market, a critical component of the country's financial system, offers a diverse range of investment opportunity for both retail and institutional investors. It plays a pivotal role in the financing of India's corporate sector, enabling companies to raise capital for expansion, debt refinancing, and operational needs beyond traditional bank loans. This market is characterized by its issuances from various sectors, including but not limited to, financial services, infrastructure, and manufacturing, reflecting the broad economic landscape of India. Over the years, the Indian government and regulatory bodies, such as the Securities Exchange Board of India (SEBI) and the Reserve Bank of India (RBI), have introduced several reforms aimed at deepening the market. These reforms include measures to enhance liquidity, improve the credit rating framework, and encourage participation from a wider investor base. The introduction of electronic platforms for bond issuance and trading is one such step towards increasing transparency and accessibility.

However, despite these positive developments, the Indian corporate bond market still faces challenges. These include issues related to credit risk, market depth, and liquidity, particularly in the secondary market. The market is predominantly dominated by institutional investors, with relatively limited participation from retail investors, partly due to a lack of awareness and perceived complexity. Interest rates, economic policies, and global economic conditions significantly influence the performance and attractiveness of corporate bonds. The Indian corporate bond market is an essential segment of the country's financial landscape, offering valuable opportunities for corporate financing and investment. While it has made significant strides in development and maturity, ongoing efforts by regulators and market participants are crucial to address existing challenges and unlock its full potential.

However, despite its significance, a comprehensive assessment of the performance of selected corporate bonds has been notably absent. This study delves into the performance evaluation of selected corporate bonds, emphasizing the need for a robust understanding of their financial dynamics.

**Review of literature**

**Robert Neil Fuhrman (1976)** shed light on the development of benchmark portfolio for the measurement of bond fund performance. found that, the regression coefficient  $Y$  as a proxy for interest rate exposer. It represents a simpler approach to the problem of interest rate immunization than the measure of duration, since it is easily computed from the readily available data. Furthermore, it is applicable to any type of asset or liability if returns are available, regardless of riskiness, call provisions, or other features. Finally, it provides a useful tool in the management of portfolios with exposure to interest rate risks.

**B Ronald N Kahn and Deepak Gulrajani** has examined the many risk factors operating in the Canadian bond market, and presented a multifactor risk model of this market. And concludes, this multifactor approach provides a quantitative, accurate, and even intuitive framework for analysing Canadian bond portfolio risk.

**Suchismita Bose and Dipankor Coondoo (2003)** analysed the Indian corporate bond market, revealing significant issues such as diminishing market depth, a shift towards trading in lower-rated bonds, and high volatility in Yield-to-Maturity (YTM) rates, particularly for bonds with higher credit risk. It highlights the challenges posed by information asymmetry, reduced liquidity, and the market's inability to uniformly price risk across different rating categories.

**Viral V Acharya, Yakov Amihud and Sreedhar Bharath (2009)** have studied liquidity risk in U.S. corporate bond returns. The findings highlight the regime-switching nature of liquidity risk, especially during macroeconomic stress, shedding light on investor preferences for more liquid and safer assets. The research has implications for risk management and investment decision-making in the corporate bond market.

**Vikramadithya Khanna and Umakanth Varottil (2012)** studied the critical legal frameworks necessary for a thriving corporate bond market in India, pinpointing the enforcement of contracts, insolvency procedures, market standardization, and protections against opportunistic behaviour as key areas needing reform. It convincingly argues that the deficiencies in

these legal areas are major obstacles to the market's efficiency, proposing targeted legal reforms as essential to unlocking the potential of India's corporate bond market.

D Altas (2023) has examined the approaches for measuring the liquidity of bond markets by applying transaction cost measures, volume-based measures, equilibrium price-based and market-impact measures (Sarr and Lybek, 2002), quantity-based measures and price-based measures. Concludes that, the liquidity is a very important metric for bond markets. The degree of liquidity affects the investors' choice whether to enter the market or not. Therefore, determining right bond market liquidity measures, accessing the right data are very crucial.

**Need of the study**

The examination of Indian corporate bonds' performance is pivotal in navigating the complexities of today's financial landscapes. By dissecting the nuances of risk and return associated with these investment vehicles, stakeholders can significantly enhance their investment strategies, ensuring a balanced and diversified portfolio. This scrutiny not only aids investors in making informed decisions but also paves the way for regulatory bodies to refine policies that bolster market integrity and stability. Furthermore, as India strides towards sustainable economic development, understanding the intricacies of corporate bonds becomes indispensable for channeling funds into green and sustainable projects. Thus, this study stands as a cornerstone for fostering a deeper

comprehension of the corporate bond market, ultimately contributing to the financial sector's resilience and the economy's sustainable growth.

**Objective of the study**

To systematically assess various performance metrics to understand the risk-return profile of selected Indian corporate bonds.

**Research Methodology**

The study utilized exclusively secondary data of the selected nine corporate bonds and BSE bond index over a period of 10 years [2013-14 to 2022-23 (2013-14 is the base year)] from the official websites of NSE, RBI, BSE and CCIL. The selected samples are National Thermal Power Corporation (NTPC), National Housing Bank Tax-free bonds (NHBT), National Highway Authority of India Ltd. (NHAI), Indian Railway Finance Corporation Ltd. (IRFC), Indian Renewable Energy Development Agency (IREDA), Indian Financial Corporation India Ltd. (IFCI), Housing and Urban Development Corporation (HUDCO), and Rural Electrification Corporation Limited (REC). risk-free rate of return is considered an average of 364 days Treasury bills over the study period as benchmark. The market index is taken S&P BSE India Bond Index as proxy. The collected data for the study is tabulated, presented graphically, analysed and interpreted using descriptive statistics, inferential statistics and different risk-return measurement methods.

**Data Analysis and Discussion**

**Table 1: Descriptive Statistics Results of Selected Bonds' Return**

Measures	Selected Corporate Bonds									
	BBINDEX	REC	NTPC	NHPC	NHBT	NHAI	IFCI	HUDCO	IREDA	IRFC
Mean	8.64	10.04	11.33	11.07	11.52	10.40	10.43	9.62	10.78	9.40
Sd	3.7	4.7	6.1	6.66	5.3	5.5	7.1	5.4	6.8	4.10
Median	8.3	10.8	10.5	10.8	10.5	10.0	9.0	9.2	10.5	9.8
CV	0.41	0.44	0.51	0.57	0.49	0.50	0.64	0.53	0.59	0.41
Min	4.64	1.61	2.42	3.26	3.38	1.27	1.76	1.81	2.46	2.65
Max	15.6	18.4	23.3	20.7	20.4	21.0	26.1	21.1	21.3	17.4
Range	10.9	16.8	20.9	17.4	17	19.7	24.3	19.2	18.8	14.8
Skew	0.62	-0.03	0.56	0.20	0.22	0.37	1.08	0.80	0.20	0.36

Source: Calculated based on secondary data gathered from nseindia.com

Table 1 is showing the descriptive statistics results of selected bonds return. Among the selected bonds NHBT have the highest mean returns at 11.52 (in percentage) indicating strong performance and other bonds' performance is also good. In terms of consistency, IRFC

and REC show lower coefficient of variation compared to NHPC, IFCI and IREDA, indicating more stable performance relative to their average returns. The skewness value across bonds hint at the distribution of returns, with IFIC showing positive skew, indicating the potential for occasional high returns, while REC negative skew suggests a concentration of returns closer to the lower end of its range.

**Table 2: Correlation of returns of selected bonds**

	BBINDEX	REC	NTPC	NHPC	NHBT	NHAI	IFCI	HUDCO	IREDA	IRFC
BBINDEX	1									
REC	0.82	1								
NTPC	0.82	0.95	1							
NHPC	0.64	0.79	0.89	1						
NHBT	0.86	0.94	0.93	0.80	1					
NHAI	0.75	0.96	0.90	0.72	0.83	1				
IFCI	0.07	0.42	0.53	0.76	0.38	0.42	1			
HUDCO	0.74	0.94	0.95	0.74	0.90	0.92	0.46	1		
IREDA	0.43	0.72	0.62	0.39	0.57	0.82	0.34	0.80	1	
IRFC	0.77	0.90	0.95	0.81	0.84	0.89	0.41	0.87	0.55	1

Source: Calculated based on secondary data gathered from nseindia.com

Table 2 showing the result of the correlation of returns of selected bonds. Where, BBINDEX, REC, NTPC, NHBT, and IRFC exhibit high positive correlation with each other,

suggests a strong linear relationship, implying that these assets may share common risk factors or market influence. Conversely, IFCI and IREDA shows low correlation with most other bonds, indicating the potential for diversification benefits, as these bonds exhibits less synchronized movements, allowing investor to minimization of risk.

**Table 3: Ranking of selected bonds based on Specific risk, Systematic risk and Total risk**

Bonds	Specific Risk	Rank	Systematic Risk	Rank	Total Risk	Rank
REC	0.85	2	3.85	4	4.70	2
NTPC	1.12	4	5.01	9	6.13	6
NHPC	2.39	7	4.25	7	6.64	8
NHBT	0.75	1	4.52	8	5.27	3
NHAI	1.38	5	4.16	6	5.54	5
IFCI	6.63	9	0.45	1	7.12	9
HUDCO	1.40	6	3.98	5	5.38	4
IREDA	3.83	8	2.94	2	6.77	7
IRFC	0.93	3	3.17	3	3.10	1

Source: Calculated based on secondary data gathered from nseindia.com

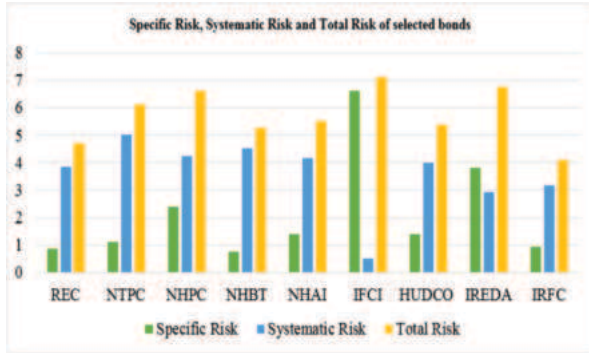


Figure 1

Table 3 is showing the ranking of selected bonds based on specific risk, systematic risk and total risk. The lower the risk stating the higher the rank. IRFC has the lowest total risk (4.10) among the selected bonds, securing the top rank in total risk. Investors seeking lower-risk investments may find IRFC appealing due to its relatively lower exposure to both specific and systematic risks.

IFCI exhibits the highest specific risk (6.63) among the selected bonds, resulting in the lowest rank for specific risk. Investor should be cautious as IFCI's returns are more sensitive to company-specific factors. NTPC and IREDA show a considerable difference in their risk profiles.

NHBT, with the lowest specific risk (0.75), ranks highest in specific risk. On the other hand, NTPC has the highest systematic risk (5.01), indicating exposure to market-wide factors.

HUDCO and NHAI strike a balance between specific and systematic risks, positioning them in the middle of the risk rankings. Investors looking for a balanced risk-return profile may consider these bonds. REC and NHBT have relatively lower total risks compared to other bonds. HUDCO, in particular, demonstrates a balance combination of specific and systematic risks. Investors interested in risk-adjusted performance may explore these options.

Table 4: Ranking of selected bonds based on Alpha and Beta calculations

Bonds	Alpha	Rank	Beta	Rank
REC to BBINDEX	1.08	6	1.04	4
NTPC to BBINDEX	-1.07	9	1.35	9
NHPC to BBINDEX	0.15	8	1.15	7
NHBT to BBINDEX	4.47	4	1.22	8
NHAI to BBINDEX	0.36	7	1.12	6
IFCI to BBINDEX	4.82	3	0.13	1
HUDCO to BBINDEX	5.97	1	1.07	5
IREDA to BBINDEX	1.15	5	0.79	2
IRFC to BBINDEX	5.79	2	0.86	3

Source: Calculated based on secondary data gathered from nseindia.com

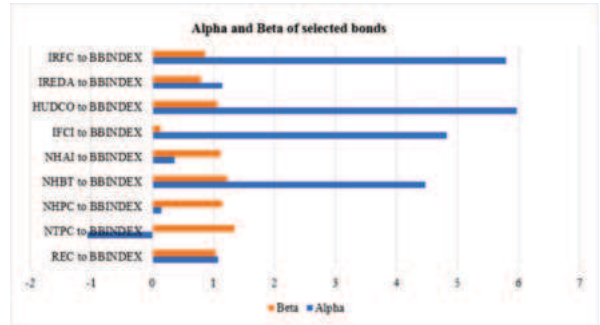


Figure 2

Table 4 is showing the ranking of selected bonds based on alpha and beta calculations. HUDCO has the highest alpha (5.97), indicating it has performed exceptionally well in generating excess returns compared to the market (BBINDEX). IFCI and IFCI also show high alphas (5.79 and 4.82, respectively), suggesting their potential for generating excess returns. NHBT demonstrates a notable alpha of 4.47, indicating strong performance. NTPC and REC exhibit negative alphas (-1.07 and 1.08, respectively), suggesting underperformance relative to BBINDEX. NTPC, NHBT and NHPC have higher betas (1.35, 1.22, and 1.15, respectively), indicating higher sensitivity to market movements IFCI, IREDA, and IRFC show lower betas (0.13, 0.79, and 0.86, respectively), implying lower sensitivity to market fluctuations. REC, NHAI and HUDCO fall in the moderate beta range, indicating a balanced sensitivity to market changes.

Table 5: Ranking of selected bonds based on Active Premium

Bonds	Active Premium	Rank
REC to BBINDEX	1.41	7
NTPC to BBINDEX	2.69	2
NHPC to BBINDEX	2.43	3
NHBT to BBINDEX	2.88	1
NHAI to BBINDEX	1.77	6
IFCI to BBINDEX	1.80	5
HUDCO to BBINDEX	0.99	8
IREDA to BBINDEX	2.14	4
IRFC to BBINDEX	0.76	9

Source: Calculated based on secondary data gathered from nseindia.com

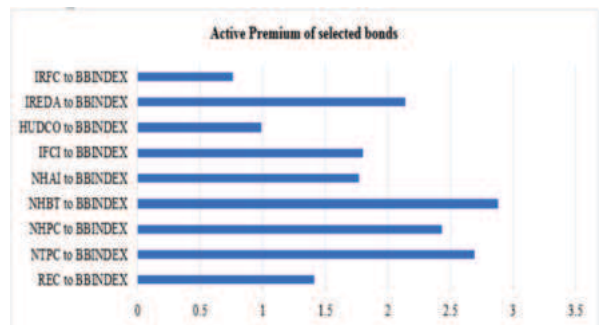


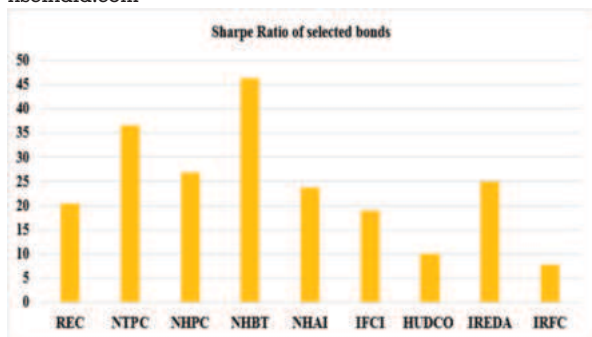
Figure 3

Table 5 is showing the ranking of selected bonds based on active premium. NHBT, NTPC, and NHPC exhibit high active premium (2.88, 2.69, and 2.43, respectively), indicating the potential for generating excess returns compared to the benchmark (BBINDEX). IREDA, IFCI, and NHAI show moderate active premium (2.14, 1.80, and 1.77, respectively), suggesting a reasonable level of excess returns. REC, HUDCO, and IRFC have relatively lower active premium (1.41, 0.99, and 0.76, respectively), indicating a more conservative level of excess returns.

**Table 6: Ranking of selected bonds based on Sharpe Ratio**

Bonds	Annualized Sharpe (9.8%)	Rank
REC	20.48	7
NTPC	36.67	2
NHPC	26.91	3
NHBT	46.29	1
NHAI	23.83	6
IFCI	19.00	5
HUDCO	10.05	8
IREDA	25.07	4
IRFC	7.74	9

Source: Calculated based on secondary data gathered from nseindia.com



**Figure 4**

Table 6 is showing the ranking of selected bonds based on Sharpe ratio. NHBT has the highest Sharpe ratio (46.29), indicating an attractive risk-adjusted returns relative to the risk-free rate ( $R_f = 9.8\%$ ). NTPC, NHPC, and IREDA also shows robust Sharpe ratios (36.67, 26.91, and 25.07, respectively), suggesting favourable risk-adjusted returns. NHAI, IFCI, and REC have moderate Sharpe ratio (23.83, 19.00, and 20.48, respectively), offering a reasonable balance between risk and return. IRFC exhibits the lowest Sharpe ratio (7.74), indicating relatively lower risk-adjusted returns.

**Findings**

1. Bonds NHBT and NHPC have the highest mean returns at 11.52 and 11.07, respectively indicating potentially better performance. investors may consider these for higher returns.
2. IRFC bonds has the lowest mean returns at 9.40, which might make it less attractive to investors seeking higher returns.
3. Bonds IFCI, IREDA and NHPC have higher standard deviation (7.1, 6.8, and 6.6 respectively), indicating greater variability in returns. Investors seeking lower risk may prefer bonds with lower standard deviation, such as REC and IRFC.
4. Bonds of IFCI, IREDA and NHPC have higher CV values (0.64, 0.59, and 0.57, respectively), suggesting higher risk relative to return. Investor may consider the trade-off between risk and return.
5. Bonds IFCI, HUDCO and NTPC have positively skewed returns, suggesting the presence of outliers or higher returns on the right side of distribution. Investor should be aware of potential tail risk.

6. REC has slightly negatively skewed returns, indicating a longer left tail. Investor may interpret this as potential downside risk.
7. Investors with a preference lower risk may lean towards bonds like IRFC, while those seeking higher returns and accepting higher risk might consider NTPC or IFCI.
8. Investors with a high appetite for returns may lean towards NHBT, while those seeking stability might consider NTPC, NHPC, or IREDA.
9. Balancing returns with risk is crucial. NHAI's moderate return with a balanced risk profile might be suitable for investors with a moderate risk tolerance.
10. Investors with a conservative risk preference may favour IRFC, while it is comfortable with higher risk might explore NTPC, NHPC, IFCI and IREDA.
11. IREDA, IRFC, and IFCI might appeal to investors seeking high returns with lower sensitivity to market fluctuations.
12. Investor looking for diversification may consider NTPC, REC and NHAI, which have varying alphas and betas.
13. NTPC and REC may be suitable for risk-averse investors due to their negative alphas indicating potential stability.
14. Bonds with higher betas (NHBT, NHPC) may require closure monitoring of market trends while lower-beta bonds (IREDA) might provide more stability.
15. Investor with a higher risk appetite may consider NHBT, NTPC, and NHPC, which offer the potential for higher excess returns.
16. IREDA, IFCI, and NHAI provide a balance level of active premium suitable for investors seeking a moderate risk-return profile.
17. REC, HUDCO, and IRFC may be suitable for more conservative investors, as they offer a lower level of active premium.
18. Investors looking for high risk-adjusted returns may be considered NHBT, NTPC, NHPC, and IREDA.
19. NHAI, IFCI, and REC provide a balanced trade-off between risk and returns, suitable for investors with a moderate risk appetite.
20. IRFC may be more suitable for risk-averse investors, although it offers a lower risk-adjusted returns.

**CONCLUSION**

The analysis of selected corporate bonds provides valuable insights for investors to make informed decisions based on their risk tolerance, return expectations, and investment objectives. NHBT emergence as a strong contender for investors seeking maximum returns with a higher risk tolerance. Its high mean returns, attractive risk-adjusted returns, and potential for excess returns compare to the market make it an appealing option. For investor prioritizing stable returns with moderate risk, NTPC and NHPC present consistent performance with favourable risk-adjusted returns. These bonds offer a balanced combination of risk and return, making them suitable for investors seeking stability in their investment portfolios. IREDA, despite exhibiting higher systematic and total risks, offers a balance level for active premium and favourable risk-adjusted returns. Investors with a moderate risk appetite and interest in the renewable energy sector may find IREDA appealing for diversification purpose. NHAI a balanced performance with moderate returns and risk levels, making it suitable for investors seeking a balance between risk and return, particularly those interested in infrastructure development. REC and IRFC offer stability with lower risk profile and slightly lower returns compared to other bonds. These bonds are well-suited for risk-averse investors looking for stable returns and are comfortable with lower risk exposure.

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