



A Long-Run Analysis of Sovereign Gold Bonds versus Other Gold Investment Instruments in India

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Abstract: This study examines gold investment decisions by identifying parameters influencing investor choices and analysing the working of the Sovereign Gold Bond (SGB) Scheme in India in comparison with Gold Exchange Traded Funds, physical gold, and Gold Funds using both qualitative and quantitative measures. The research first focuses on understanding the SGB Scheme and then identifies and analyses the parameters impacting gold investment decisions. It compares SGBs, Nippon India Gold Savings Fund, Nippon India ETF Gold BeES, and 24-karat gold coins by investing an equal amount of Rs.100000 in each option for a eight-year period from November 2017 to November 2025, using traditional and modern capital budgeting techniques, including Pay-back period, Discounted Pay-back period, Internal Rate of Return, Net Present Value, and Profitability Index methods. Secondary data from public and private organisational websites has been used. The study identifies twenty parameters, with seven quantitative parameters and nine qualitative parameters favouring SGBs, while eight qualitative parameters support both the Gold Savings Fund and ETF Gold BeES, and six support 24-karat gold coins. Overall, sixteen parameters indicate SGBs as the optimal long-term gold investment option, with the Gold Savings Fund and ETF Gold BeES tied being the second-best alternatives and 24-karat gold coins least recommended.

Keywords: Sovereign Gold Bond, Gold Investment, Capital Budgeting, ETF Gold Bees, Gold Savings Fund, Physical Gold

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1. Introduction

India is one of the world's largest gold markets, according to the World Gold Council. Gold plays a key role in the culture of the country, serving as a store of value, a sign of wealth and prestige, and an essential component of numerous rituals. A strong affinity for gold and the practical concerns about the portability and security of 'Gold as an

investment' go hand in hand. Gold is mostly purchased in its physical form to be used either as an ornament or as an investment. The investment part of the purchase of gold comprises taxes, making charges, etc. These charges can be avoided wholly or partly by investing in paper gold like Gold Mutual Funds, Gold Exchange Traded Funds, etc. The reality of the gold market today does not match the notion of gold as an immobile and cumbersome asset. More than 180 billion dollars worth of gold is exchanged daily, greater than all other major financial assets combined. Due to its liquidity, gold is beneficial during both expansionary and contractionary periods. Additionally, investors can still use gold to address their most pressing demands even if they are difficult-to-sell illiquid assets. Gold has historically outperformed equities in times of financial turmoil, so investors can use it to diversify their portfolios and even as a source of liquidity. It plays a crucial role in building a more stable and balanced portfolio by assisting investors in managing the risks that other financial assets give rise to. Since 1971, the returns on gold have surpassed bonds and has been similar to those of stocks. Over the past twenty years, gold has outperformed the majority of the key asset classes. Global investment demand for gold has increased by an average of fifteen percent annually over the past twenty years.

2. Literature Review

2.1. A study on various forms of gold investment

In this context Dr. M. Nishad Nawaz and Mr. Sudindra V. R. examined the numerous gold investment options available to investors. Questionnaires were the source of primary data, whereas websites, academic papers, and periodicals were the source of secondary data. According to study, many investors still favour ornaments, gold coins, and gold bullion bars as forms of investment rather than choosing Exchange Traded Funds and futures and options, which provide a greater return.

2.2. An empirical study on gold investment rage among the professionals- a comparative analysis of gold etf, e-gold and gold funds

Jalpa Takkar and Sheenam Gogia (2013) attempted to shed light on the many avenues of gold investment options available in the market in their research paper "an empirical study on gold investment rage among the professionals—a comparative analysis of gold ETF, e-gold, and gold funds." Additionally, they attempted to determine the selected investors' attitudes and awareness of alternative gold investment strategies in the Pune area. The study emphasises the necessity of promoting investment in novel gold substitutes.

2.3. A Study on Investors Attitude towards Physical Gold and e-gold in Coimbatore City

In the paper “A Study on Investors Attitude towards Physical Gold and e-gold in Coimbatore City” from 2014, Dr. B. Saranya and Ms. U. Jisha make an effort to learn about the attitudes of investors towards physical gold and e-gold in Coimbatore City. According to the study, the majority of people have invested in e-gold since it is the most effective way to buy gold. Investors are guaranteed safety by it. The amount of awareness is however moderate. Therefore, suitable actions must be taken to inform investors about investing in e-gold so that the financial sector of our nation can profit more from it.

2.4. The critical review of gold monetisation scheme and Sovereign Gold Bond Scheme

In the paper “The critical review of gold monetisation scheme and ‘Sovereign Gold Bond Scheme’, is an organised attempt to examine the goals, variations, developments, and difficulties encountered in the implementation of the two gold programmes, namely the Gold Monetization Scheme and the ‘Sovereign Gold Bond Scheme’, introduced by the Government of India. The conclusion is that due to the emotional and sentimental qualities connected to gold, various gold schemes are good in general but unsuccessful in the Indian context. In a country like India, there is a significantly greater likelihood that a Sovereign Gold Bond will be accepted between Gold monetization scheme and ‘Sovereign Gold Bond Scheme

2.5. Is Sovereign Gold Bond is Better Than Other Gold Investment?

The research paper “Is Sovereign Gold Bond is Better Than Other Gold Investment?”, tries to find out if investment in Sovereign Gold Bonds is the best type of gold investments. As per the results of the research, ‘Sovereign Gold Bond Scheme’ is superior to other gold investments and the research also cautions about the fact that the amount that an investor should invest in the scheme depends on the risk appetite of the investor.

2.6. Sovereign Gold Bond (SGB): A manufactured Foreign exchange crisis and probable way out

The paper Sovereign Gold Bond (SGB): A manufactured Foreign exchange crisis and probable way out attempt to comprehend how the Sovereign Gold Bond Scheme affect s

the balance of payments, foreign exchange and if it will lead to exchange rate instability. It is concluded that in the twin contract for gold and currency hedging, only the value of the two assets will be tracked. The contract value will consequently be lower than the standard gold price and currency price, protecting our balance of payments and our foreign exchange reserves.

2.7. Deciphering Investors' Response to Sovereign Gold Bond Scheme of Government of India

The research paper "Deciphering Investors' Response to Sovereign Gold Bond Scheme of Government of India" attempts to identify and analyse the key factors behind the increase of subscription to 'Latter Tranches' of Sovereign Gold Bonds. It can be concluded that changing certain Sovereign Gold Bond conditions, such as lowering the minimum investment size and exempting capital gains from tax, would have made the Sovereign Gold Bond a more appealing investment for investors, which would have increased interest in the latter tranches of subscriptions.

2.8. Investor's Attitude Towards Physical Gold and Sovereign Gold Bonds

The study, "Investor's Attitude Towards Physical Gold and Sovereign Gold Bonds" tries to find out about the investors' attitude towards Sovereign Gold Bond and physical gold. The study concludes that investors place greater emphasis on three main factors: safety, purity, and liquidity. Today, investing in sovereign gold bonds is more effective than investing in actual gold for a number of reasons, including high liquidity and regulatory assurances of security. However, there is currently relatively little public understanding of the benefits of investing in sovereign gold bonds.

2.9. Sovereign Gold Bond Scheme—An Alternative to Physical Gold Investment in Kerala

The research tries to find the reasons for very less amount being invested under the 'Sovereign Gold Bond Scheme' all over India and especially in Kerala, despite the fact that the Indian Government implemented the Sovereign Gold Bond Scheme as a way to reduce gold imports. The research concludes that the people of Kerala prefer buying actual gold and not Sovereign Gold Bonds. Thus, it talks about the importance of increasing the awareness about the 'Sovereign Gold Bond Scheme'.

3. Data and Empirical Methodology

3.1. Parameters identified for the evaluation of gold investments

- (a) **Purity of gold** – Higher the purity, higher the value of the gold. 24-karat gold has the highest purity, with nothing mixed with it. Based on the purity of gold, the value of the assets or of the underlying asset gets impacted, which in turn affects the gold investments made.
- (b) **Cost of storage** – When gold investment is done through actual purchase, it is important to provide security to it, which leads to costs like locker rent.
- (c) **Goods and Service Tax** – At the time of purchase of gold, Goods and Service Tax of 3 percent is charged. While, many gold investment options are free from this tax.
- (d) **Long-term capital gain tax** – For long-term capital gains, on redemption or maturity capital gain tax is levied as per the Income Tax Act, 1961.
- (e) **Maturity/redemption** – In case of securities, maturity or redemption date might be mentioned. In case of actual purchase of gold there is no such date.
- (f) **Safety** – Investment in increasing the security is must if actual gold is purchased. Whereas, if units of mutual fund or grams of the ‘Sovereign Gold Bond Scheme’ is purchased, spending on their safety is not that important.
- (g) **Liquidity** – In times of need, the liquidity factor plays a crucial role. Physical gold can be easily sold. If securities are listed in secondary market, even then selling is easy, making it highly liquid.
- (h) **Returns and profit** – Making higher profits is the main reason behind investments. The gold investment which gives the highest returns would be one of the most favourable investment options.
- (i) **Usage as collateral for a loan** – With physical gold in hand, gold loans can be availed from banks or other financial institutions. Similarly, the ‘Sovereign Gold Bonds’ can also be used as collateral for loan.
- (j) **Interest income**– Gold investments which provide regular and guaranteed returns is considered more attractive.
- (k) **Making and wastage charges** – If gold investment is in the form of purchasing gold, making and wastage charges might have to be paid. These charges can be avoided or reduced by investing in other gold investment options.

- (l) **Outcomes of capital budgeting techniques** – Through the use of these techniques we can better judge and understand the gold investments quantitatively. The techniques used are Net Present Value method, pay-back period method, discounted pay-back period method, Internal Rate of Return and Profitability index method.
- (m) **Discount on purchase** – On purchase, if any investment provides discount, then the customer can save some money or reinvest it or use it. In case of the ‘Sovereign Gold Bond Scheme’, Rupees 50 is provided as a discount on per gram of gold if purchase is done online.
- (n) **Lock-in period** – If gold-investments have a lock-in period, it could affect the liquidity of the investments. Thus, it could play an important role in choosing the gold-investment option.
- (o) **Investment limit** – If maximum and minimum limits of investment exist, it could impact the gold-investment decisions.

3.1.1. Assumptions made for the purpose of calculations under the capital budgeting techniques

- (a) For each of the four kinds of gold investments taken into consideration in this research, it is presumed that an equal investment of Rs.1,00,000 is made.
- (b) Investments will be made during an eight-year period beginning in November 2017 and concluding in November 2025. The time frame is taken as 8 years because the research focuses on long-term investments only and also because SGB matures in 8 years.
- (c) The rate of discount or the cost of capital is assumed to be 10 percent for performing computations.
- (d) Long-term capital gain tax is not taken into consideration for the purpose of calculations, that is, it doesn't form part of computations done for quantitative parameters.
- (e) Making and wastage charges is assumed to be 10 percent.
- (f) The ‘24-karat Gold Coins’ refer to the gold coins issued by the banks only. This assumption is made as only bank-issued Gold coins are pledged as collateral for Gold Loans by majority of the banks. Gold Coins not issued by banks are usually not pledged for taking loan.

- (g) It has been assumed that the SGBs' redemption happens on maturity, that is, in the eighth year.
- (h) We assume that the Sovereign Gold Bonds are not held in dematerialised form and hence it is not sold through the stock exchanges. It can be held in paper form or in the form of e-certificate issued by the Reserve Bank of India.

3.1.2. Determination of the per unit values of the various gold investments

(a) The Sovereign Gold Bond Scheme

- The per gram values of Sovereign Gold Bonds is taken from the website of the Reserve Bank of India.
- The issue price of "SGB 2017-18 Series-VI" as on 6th November 2017 was Rs.2945.
- And the per gram value of Sovereign Gold Bonds as on 6th November 2025 is taken as Rs.12066, which is as per the Reserve Bank of India's notification, based on the simple average of 'closing gold price of 999 purity' of the previous 3 business days from the date of maturity.

(b) Nippon India Gold Savings Fund

- The Net Asset Value of the units of 'Nippon India Gold Savings Fund' has been taken from the official site of Nippon India Mutual Fund.
- Rupees 12.5418 is the Net Asset Value of the fund as on 6th November 2017 and Rupees 46.1479 is the Net Asset Value of the fund as on 6th November 2025.

(c) Nippon India ETF Gold BeES

- The Net Asset Value of the units of 'Nippon India ETF Gold BeES' has been taken from the official site of Nippon India Mutual Fund.
- Rupees 26.15 is the Net Asset Value of the fund as on 6th November 2017 and Rupees 100.07 is the Net Asset Value of the fund as on 6th November 2025.

(d) '24-karat Gold Coins'

- The per gram value of it has been taken from real time websites by name, 'goldpriceindia.com', 'https://in.tradingview.com/', and 'https://www.5paisa.com/'.
- The price of the gold as on 6th November 2017 is taken as Rs.2917 and on 6th November 2025 is taken as Rs.12191, and these prices are the end of the day prices of 24-karat gold.

Table 1: Summary of the per unit values of various gold investments

<i>PARTICULARS</i>	<i>SOVEREIGN GOLD BOND</i>	<i>NIPPON INDIA GOLD SAVINGS FUND</i>	<i>Nippon India ETF Gold BeES</i>	<i>24-KARAT GOLD COINS</i>
Per unit/gram value, as on 6 th November 2017	2945 per gram	12.5418 per unit	26.15 per unit	2917 per gram
Per unit/gram value, as on 6 th November 2025	12066 per gram	46.1479 per unit	100.07 per unit	12191 per gram

Table 2: Calculations determining the number of units or grams of the various gold investments

<i>PARTICULARS</i>	<i>SOVEREIGN GOLD BOND</i>	<i>NIPPON INDIA GOLD SAVINGS FUND</i>	<i>Nippon India ETF Gold BeES</i>	<i>24-KARAT GOLD COINS</i>
Investment value (in Rupees) (A)	100000	100000	100000	100000
Per unit/ per gram value as on April 2018 (refer table 1) (B)	2945 per gram	12.5418 per unit	26.15 per unit	2917 per gram
Number of units/ grams purchased (A/B) (rounded off to 2 decimal places)	33.96 grams	7973.34 units	3824.1 units	34.28 units

For the purpose of comparison, investment values are assumed to be equal and taken as Rs. 100000, which is represented by A. The per unit/gram value, as on November 2017 is represented by B (refer table 1).

$$\text{Number of unit/gram purchased} = \frac{\text{Investment value}}{\text{Per unit or per gram value of the gold investment considered}}$$

Table 3: Calculation of net investments, net returns and profits from the gold investments

<i>PARTICULARS</i>	<i>SOVEREIGN GOLD BOND</i>	<i>NIPPON INDIA GOLD SAVINGS FUND</i>	<i>Nippon India ETF Gold BeES</i>	<i>24-KARAT GOLD COINS</i>
Investment in 2017 (in Rupees)	100000	100000	100000	100000
Add: Making and wastage charges of 10% (in Rupees)	NIL	NIL	NIL	100000*10% =10000

PARTICULARS	SOVEREIGN GOLD BOND	NIPPON INDIA GOLD SAVINGS FUND	Nippon India ETF Gold BeES	24-KARAT GOLD COINS
Add: Goods and Service Tax of 3% (in Rupees)	NIL	NIL	NIL	$(100000+10000)*3\% = 3300$
Net investment (in Rupees)	100000	100000	100000	113300
Gross Returns in 2025 (in Rupees) (rounded off to 2 decimal places) [Number of units or grams (refer table 2) * Per unit or per gram value as on 6 th November 2025 (refer table 1)]	33.96 grams* Rs.12066 per gram = Rs.409761.36	7973.34 units* Rs.46.1479 per unit= Rs.367952.9	3824.1 units* Rs.100.07 per unit= Rs.382677.69	34.28 units* Rs.12191 per gram= Rs.417907.48
Add: Interest received for 8 years (in Rupees)	$100000*2.5\%*8 = 20000$	NIL	NIL	NIL
Less: Making and wastage charges of 10% (in Rupees)	NIL	NIL	NIL	$417907.48*10\% = Rs.41790.75$
Net Returns (in Rupees)	429761.36	Rs.367952.9	Rs.382677.69	Rs.376116.73
Profit (in Rupees) (Net returns- Net investments)	329761.36	Rs.267952.9	Rs.282677.69	Rs.276116.73
Profit (in percentage) (rounded off to 2 decimal places) [(Profit/ Net investment) * 100]	329.76	267.95	282.68	276.12

3.1.3. Data interpretation and analysis of the above table

- For the purpose of comparison, the investment period and the investment amount are kept constant for all types of gold investments.
- At the time of purchase, as well as sale, the making and wastage charges is charged for '24-karat Gold Coins'. Since, these charges vary from jeweller to jeweller and depends on the intricacy of the items made, it is assumed to be 10 percent.
- The Goods and Service Tax is applicable at the time of purchase of actual gold. Hence, 3 percent tax is also added.
- The net investment includes the initial investment made, along with, the expenses incurred and the taxes paid.
- We can observe that, in the case of the 'Sovereign Gold Bonds', 'Nippon India Gold Savings Fund' and 'Nippon India ETF Gold BeES', there are no expenses incurred and there is no requirement of even payment of Goods and Service Taxes, which makes them a very less expensive investment.

- (f) Gross returns are calculated in 2025, after a long-term of 8 years. It is a product of the 'number of units or grams of a given gold investment' and 'per unit or per gram value of a given gold investment'.
- (g) The 'Sovereign Gold Bond Scheme' is the only gold investment option providing an annual interest of 2.5 percent per annum, which is credited to the investor's account in two semi-annual instalments. This investment option is suitable for investors looking for regular and fixed interest income.
- (h) The costliest investment is that of the investment in the '24-karat Gold Coins', which is Rupees 113300.
- (i) The 'Sovereign Gold Bond Scheme' provide the highest net returns and the highest profit, proving it to be the best gold investment option, with respect to returns and profits.
- (j) 'Nippon India Gold Savings Fund' provides the lowest returns and profits. While, 'Nippon India ETF Gold BeES' provides the second highest returns and second highest profits.

Calculation of the profit percentage gives more clarity. It can be clearly seen that Sovereign gold bonds provide more than 300 percent profit percentage of 329.76 percent. Whereas, all the other investment options provide a profit percentage less than 300 percent. The least profit percentage is that of 'Nippon India Gold Savings Fund'.

3.2. Empirical methodology

Therefore, upon the analysis of the above variables that include net profits, net investments in various forms of gold (instruments) the following calculations under different methodologies are undertaken to finally arrive at the points of inference and comparison that empirically support the analysis in selecting the best form of investment.

3.2.1. Calculation using the payback period method

Pay-back period helps us find the period within which the investment and the expenses related to the investment are recovered. The formula for its calculation is as follows:

Pay-back period = Number of years before full recovery + [Balance to be recovered after reducing the amount recovered before the year of full recovery/ Cash inflow of the year in which full recovery takes place]

Table 4: Calculations of the cash flows and the cumulative cash flows of gold investments

YEAR	SOVEREIGN GOLD BOND		NIPPON INDIA GOLD SAVINGS FUND		Nippon India ETF Gold BeES		24-KARAT GOLD COINS	
	CASH FLOWS	*CCF	CASH FLOWS	*CCF	CASH FLOWS	*CCF	CASH FLOWS	*CCF
CASH INFLOW								
2018	2500	2500	NIL	NIL	NIL	NIL	NIL	NIL
2019	2500	5000	NIL	NIL	NIL	NIL	NIL	NIL
2020	2500	7500	NIL	NIL	NIL	NIL	NIL	NIL
2021	2500	10000	NIL	NIL	NIL	NIL	NIL	NIL
2022	2500	12500	NIL	NIL	NIL	NIL	NIL	NIL
2023	2500	15000	NIL	NIL	NIL	NIL	NIL	NIL
2024	2500	17500	NIL	NIL	NIL	NIL	NIL	NIL
2025	409761.36 +2500= 412261.36	429761.36	367952.9	367952.9	382677.69	382677.69	417907.48	417907.48
CASH OUTFLOW								
2017	100000	100000	100000	100000	100000	100000	**113300	113300
2025	NIL	100000	NIL	100000	NIL	100000	41790.75	155090.75
* CCF stands for Cumulative Cash flow								
** Initial Investment amount (100000) + Making and wastage charges (10000) + Goods and Service Tax 3300) = = Rupees 113300								

Table 5: Calculations of the payback periods of Gold investments

PARTICULARS	CALCULATION OF PAY-BACK PERIOD BASED ON THE ABOVE FORMULA (rounded off to 2 decimal places)
Sovereign Gold Bond Scheme	$7 + [(100000 - 17500) / 412261.36] = 7.2$
Nippon India Gold Savings Fund	$7 + [(100000 / 367952.9)] = 7.27$
Nippon India ETF Gold BeES	$7 + [(100000 / 382677.69)] = 7.26$
24-Karat Gold Coins	$7 + [(155090.75 / 417907.48)] = 7.37$

3.2.1.1. Data interpretation and analysis

- On the Sovereign gold bond, 2.5 percent interest per annum is given. Therefore, 100000 is multiplied by 2.5 percent giving us Rupees 2500 per year of interest income.
- The Sovereign Gold Bond Scheme is the only gold investment, providing an annual and fixed cash inflow of Rupees 2500.
- This method advises to not invest in '24-karat Gold Coins', as it has the highest pay-back period. Investments with longer pay-back periods are usually riskier because long term estimates are less reliable.

- (d) The Sovereign Gold Bond Scheme has the lowest pay-back period and as per the pay-back period method it is best to invest in the Sovereign Gold Bond Scheme, when compared to other gold investments as the amount invested is recovered the fastest.

3.2.2. Calculations using the Discounted Payback Period

Discounted pay-back period method is similar to the pay-back period method, with the only difference being the use of the time value of money, to find the present values of the cash flows and then determine the period within which the present values of the cash outflows are recovered.

Discounted pay-back period = Number of years before full recovery + [Balance to be recovered after reducing the discounted amount recovered before the year of full recovery/ Discounted cash inflow of the year in which full recovery takes place]

Table 6: Calculations of the discounted payback period in the case of Sovereign Gold Bond Scheme

YEAR	PRESENT VALUE INTEREST FACTOR AT 10 %	CASH FLOW OF SGB	PRESENT VALUE OF CASH FLOW OF SGB	CUMULATIVE CASH FLOW OF SGB
CASH INFLOW				
2018	0.909	2500	2272.5	2272.5
2019	0.826	2500	2065	4337.5
2020	0.751	2500	1877.5	6215
2021	0.683	2500	1707.5	7922.5
2022	0.621	2500	1552.5	9475
2023	0.564	2500	1410	10885
2024	0.513	2500	1282.5	12167.5
2025	0.467	2500	1167.5	13335
2025	0.467	409761.36	191358.56	204693.56
CASH OUTFLOW				
2017	1	100000	100000	100000
Discounted pay-back period		$7 + [(100000 - 13335) / 191358.56] = 7.45$		

Table 7: Calculations of the discounted payback period in the case of Nippon India Gold Savings Fund

YEAR	PRESENT VALUE INTEREST FACTOR AT 10 %	CASH FLOW OF NIPPON INDIA GOLD SAVINGS FUND	PRESENT VALUE OF CASH FLOW OF NIPPON INDIA GOLD SAVINGS FUND	CUMULATIVE CASH FLOW OF NIPPON INDIA GOLD SAVINGS FUND
CASH INFLOW				
2025	0.467	367952.9	171834	171834
CASH OUTFLOW				
2017	1	100000	100000	100000
Discounted pay-back period		$7 + [(100000/171834)] = 7.58$		

Table 8: Calculations of the discounted payback period in the case of Nippon India ETF Gold BeES

YEAR	PRESENT VALUE INTEREST FACTOR AT 10 %	CASH FLOW OF NIPPON INDIA ETF GOLD BeES	PRESENT VALUE OF CASH FLOW OF NIPPON INDIA ETF GOLD BeES	CUMULATIVE CASH FLOW OF NIPPON INDIA ETF GOLD BeES
CASH INFLOW				
2025	0.467	382677.69	178710.48	178710.48
CASH OUTFLOW				
2017	1	100000	100000	100000
Discounted pay-back period		$7 + [(100000/178710.48)] = 7.56$		

Table 9: Calculations of the discounted payback period in the case of 24-Karat Gold Coins

YEAR	PRESENT VALUE INTEREST FACTOR AT 10 %	CASH FLOW OF 24-KARAT GOLD COINS	PRESENT VALUE OF CASH FLOW OF 24-KARAT GOLD COINS	CUMULATIVE CASH FLOW OF 24-KARAT GOLD COINS
CASH INFLOW				
2025	0.467	417907.48	195162.79	195162.79
CASH OUTFLOW				
2017	1	113300	113300	113300
2025	0.467	41790.75	19516.28	132816.28
Discounted pay-back period		$7 + [(132816.28/195162.79)] = 7.68$		

3.2.2.1. Data interpretation and analysis

- (a) The highest discounted pay-back period is that of '24-karat Gold Coins', suggesting investors to not invest in this type of gold investment as the time of recovery of initial investment and expenses is higher.

- (b) ‘Nippon India Gold Savings Fund’ and ‘Nippon India ETF Gold BeES’ have discounted pay-back periods of 7.58 years and 7.56 years, and thus choosing anyone of this as gold investment would not make much difference as the difference is less.
- (c) The ‘Sovereign Gold Bond Scheme’ has the lowest discounted pay-back period of 7.45 years suggesting it to be the best investment option as per the discounted pay-back period technique. The time period of the recovery of the investment made in the ‘Sovereign Gold Bond Scheme’ is the least, making it an attractive long-term gold investment option.

3.2.3. Calculation using the Net Present Value method

Net Present Value is the difference between the present values of the cash inflows and the present values of the cash outflows. This technique takes into account the time value of money factor. Using this technique, we can compare the Net Present Values of all the investments considered in the research, to come to the right conclusion.

Formula: Net Present Value = Present value of cash inflows – Present value of cash outflows

Table 10: Calculations of the Net Present Values of Gold Investments

INVESTMENTS	PRESENT VALUE OF CASH INFLOW (in Rupees)	PRESENT VALUE OF CASH OUTFLOW (in Rupees)	CALCULATION OF NET PRESENT VALUE (Present value of cash inflows – Present value of cash outflows) (in Rupees)
Sovereign Gold Bonds	204693.56 (refer table 6)	100000 (refer table 6)	104693.56
Nippon India Gold Savings Fund	171834 (refer table 7)	100000 (refer table 7)	71834
Nippon India ETF Gold BeES	178710.48 (refer table 8)	100000 (refer table 8)	78710.48
24-Karat Gold Coins	195162.79 (refer table 9)	132816.28 (refer table 9)	62,346.51

3.2.4. Calculations using the Profitability Index method

Benefit cost ratio or profitability index is derived by taking the ratio of the present values of the cash inflows and the present values of the cash outflows. Investments are accepted if profitability index is greater than 1 and rejected if profitability index is less than 1.

Formula: Profitability index = Present value of cash inflows/ Present value of cash outflows

Table 11: Calculation of Profitability Index for Gold investments

INVESTMENTS	PRESENT VALUE OF CASH INFLOW (in Rupees)	PRESENT VALUE OF CASH OUTFLOW (in Rupees)	CALCULATION OF PROFITABILITY INDEX (rounded off to 2 decimal places) (Present value of cash inflows/ Present value of cash outflows) (in Rupees)
Sovereign Gold Bonds	204693.56 (refer table 6)	100000 (refer table 6)	2.05
Nippon India Gold Savings Fund	171834 (refer table 7)	100000 (refer table 7)	1.72
Nippon India ETF Gold BeES	178710.48 (refer table 8)	100000 (refer table 8)	1.79
24-Karat Gold Coins	195162.79 (refer table 9)	132816.28 (refer table 9)	1.47

3.2.4.1. Data interpretation and analysis

- All the gold investment options have a profitability index of more than 1 and thus they can be chosen.
- The 'Sovereign Gold Bond Scheme' is the best as per this method as it has the highest profitability index.

3.2.5. Calculation using the Internal Rate of Return method

The Internal Rate of Return is the discounted rate of return that is estimated by this technique to make the estimated present values of the future cash inflows equal to the investments or cash outflows. The Internal Rate of Return is the interest rate that brings a series of cash flows to a Net Present Value of zero.

$$\text{Formula: Internal Rate of Return} = \text{LR} + \frac{(\text{NPV at LR}) * (\text{HR} - \text{LR})}{\text{NPV at LR} - \text{NPV at HR}}$$

Where:LR = Lower rate; NPV=Net Present Value HR = Higher rate

We will take two rates randomly, which are 10 percent and 20 percent. Let 10 percent be the lower rate and 20 percent be the higher rate.

Table 12: Calculations of the Internal Rate of Return for the Sovereign Gold Bond Scheme

YEAR	SOVEREIGN GOLD BOND SCHEME				
	CASH INFLOWS (A)	PRESENT VALUE FACTOR AT 10% (B)	PRESENT VALUE OF CASH INFLOWS AT 10% (A*B)	PRESENT VALUE FACTOR AT 20% (C)	PRESENT VALUE OF CASH INFLOWS AT 20% (A*C)
2018	2500	0.909	2272.5	0.833	2082.5
2019	2500	0.826	2065	0.694	1735
2020	2500	0.751	1877.5	0.579	1447.5
2021	2500	0.683	1707.5	0.482	1205
2022	2500	0.621	1552.5	0.402	1005
2023	2500	0.564	1410	0.335	837.5
2024	2500	0.513	1282.5	0.279	697.5
2025	2500	0.467	1167.5	0.233	582.5
2025	409761.36	0.467	191358.56	0.233	95474.4
Total			204693.56		105,066.9
Total cash outflow in case of Sovereign Gold Bond Scheme				Rupees 100000	
Net Present Value at 10%			204693.56 – 100000 = 104693.56		
* Net Present Value at 20%			105,066.9 – 100000 = 5,066.9		
** Internal Rate of Return			= 10 + [(104693.56)*(20-10)] / [104693.56-5,066.9] = 20.51%		

Table 13: Calculation of the internal rate of return for Nippon India Gold Savings Fund

YEAR	NIPPON INDIA GOLD SAVINGS FUND				
	CASH INFLOWS (A)	PRESENT VALUE FACTOR AT 10% (B)	PRESENT VALUE OF CASH INFLOWS AT 10% (A*B)	PRESENT VALUE FACTOR AT 20% (C)	PRESENT VALUE OF CASH INFLOWS AT 20% (A*C)
2025	367952.9	0.467	171,834	0.233	85,742.91
Total			171,834		85,742.91
Total cash outflow in case of Nippon India Gold Savings Fund				Rupees 100000	
*Net Present Value at 10%			171,834-100000= 71,834		
* Net Present Value at 20%			85,742.91-100000= -14,257.09		
** Internal Rate of Return			= 10 + [(71,834)*(20-10)] / [71,834-(-14,257.09)] = 18.34%		

Table 14: Calculation of the internal Rate of Return for Nippon India ETF Gold BeES

YEAR	Nippon India ETF Gold BeES				
	CASH INFLOWS (A)	PRESENT VALUE FACTOR AT 10% (B)	PRESENT VALUE OF CASH INFLOWS AT 10% (A*B)	PRESENT VALUE FACTOR AT 20% (C)	PRESENT VALUE OF CASH INFLOWS AT 20% (A*C)
2025	382677.69	0.467	178,710.9	0.233	89,163.9
Total			178,710.9		89,163.9
Total cash outflow in case of Nippon India ETF Gold BeES			Rupees 100000		
*Net Present Value at 10%			178,710.9-100000= 78,710.9		
* Net Present Value at 20%			89,163.9-100000= -10,836.1		
** Internal Rate of Return			= 10 + [(78,710.9)*(20-10) / 78,710.9-(-10,836.1)] = 18.79%		

Table 15: Calculation of the internal Rate of Return for 24 Karat Gold Coins

YEAR	24 karat Gold Coins				
	CASH INFLOWS (A)	PRESENT VALUE FACTOR AT 10% (B)	PRESENT VALUE OF CASH INFLOWS AT 10% (A*B)	PRESENT VALUE FACTOR AT 20% (C)	PRESENT VALUE OF CASH INFLOWS AT 20% (A*C)
2025	417907.48	0.467	195,162.79	0.233	97,372.44
Total cash inflow					
CASH OUTFLOWS					
2017	113300	1	113300	1	113300
2025	41790.75	0.467	19,516.28	0.233	9,737.25
Total			132,816.28		123,037.25
Net Present Value at 10%			195,162.79-132,816.28=62,346.51		
Net Present Value at 20%			97,372.44-123,037.25= -25,664.81		
Internal Rate of Return			= 10 + [(62,346.51)*(20-10) / 62,346.51-(-25,664.81)] = 17.08%		

3.2.5.1. Data interpretation and analysis

- In general, the higher the Internal Rate of Return the better. Hence, '24 karat Gold Coins' will be rejected as it has the lowest Internal Rate of Return.
- Out of the four investment options, the highest Internal Rate of Return is that of the 'Sovereign Gold Bond Scheme', which is 20.51 percent, therefore as per this technique it is advisable to invest in this scheme.

3.3. Evaluating gold investments based on all the identified parameters

Table 16: Judging the different Gold investment options based on the parameters identified in the research

PARAM-ETER	BASIS OF CHOSING THE GOLD INVESTMENT	NIPPON INDIA GOLD SAVINGS FUND	Nippon India ETF Gold BeES	24 karat Gold Coins	SOVEREIGN GOLD BOND SCHEME	INVESTMENT CHOSEN BASED ON THE PARAMETER
Purity of gold	Purer the gold, the better it is, as the value of it would be higher. Thus, the investment backed by or consisting of higher purity of gold is preferred.	This fund invests in 'Nippon India ETF Gold BeES', thus it indirectly invests in 99.5% purity of gold.	Invests in physical gold bar of 99.5 percent purity.	It contains 99.9 percent of pure gold.	The nominal value of gold bond is based on the price of gold of 99.9 percent purity.	A) 24 karat Gold Coins B) Sovereign Gold Bond Scheme
Cost of storage	The lower the storage cost, the better.	The storage cost is low as it is issued in paper form or digital form.	The storage cost is low as the gold is not stored by the investors.	The storage cost is high. If stored in bank locker, locker rent has to be paid.	The storage cost is low as it is available in paper form or dematerialised form.	A) Nippon India Gold Savings fund B) Nippon India ETF Gold BeES C) Sovereign Gold Bond Scheme
Goods and Service Tax	Lesser or no Goods and Service Tax is preferred.	NIL	NIL	3% Goods and Service Tax is charged at the time of purchase.	NIL	A) Nippon India Gold Savings fund B) Nippon India ETF Gold BeES C) Sovereign Gold Bond Scheme
Long term Capital gains tax	Lower or no long-term capital gains tax is preferred.	There is an effective long-term capital gains tax of 20.8%	There is an effective long-term capital gains tax of 20.8%	There is an effective long-term capital gains tax of 20.8%	There is no capital gains tax if it is held till maturity. But if redeemed before maturity there is capital gains tax of 20.8%.	Sovereign Gold Bond Scheme (if held till maturity there is no requirement of paying tax)
Interest income	The greater the interest income, it is better and is preferred.	NIL	NIL	NIL	Annual interest of 2.5% is paid twice, on a semi-annual basis.	Sovereign Gold Bond Scheme

PARAMETER	BASIS OF CHOOSING THE GOLD INVESTMENT	NIPPON INDIA GOLD SAVINGS FUND	Nippon India ETF Gold BeES	24 karat Gold Coins	SOVEREIGN GOLD BOND SCHEME	INVESTMENT CHOSEN BASED ON THE PARAMETER
Maturity / redemption	Lesser or no maturity or redemption period is preferred.	It has no maturity period as it is an open-ended scheme and can be redeemed anytime based on its Net Asset Value.	It has no maturity period as it can be freely traded in stock exchanges.	It has no maturity period and can be sold anytime by the investor.	It has a lock in period of 8 years. Although, the redemption is allowed from the fifth year.	A) Nippon India Gold Savings fund B) Nippon India ETF Gold BeES C) 24 karat Gold Coins
Safety	Higher safety is preferred	Higher safety, as gold need not be held by investors.	Higher safety, as gold need not be held by investors.	Lesser safety, as it involves handling the gold.	Higher safety, as it is in dematerialised form or paper form and has Government backing.	A) Nippon India Gold Savings fund B) Nippon India ETF Gold BeES C) Sovereign Gold Bond Scheme
Returns (refer table 3)	Greater returns are preferred.	Rs. 367952.9	Rs. 382677.69	Rs. 376116.73	Rs. 429761.36	Sovereign Gold Bond Scheme
Liquidity	The ability to liquidate it, in order to get cash immediately, whether in paper form or dematerialised form.	The units of mutual fund can be redeemed anytime based on its Net Asset Value.	Since it is traded in stock exchange, it can be sold freely, anytime.	It can be sold anytime.	Only after 5 years it can be redeemed. But if kept in dematerialised form, it can be sold anytime.	A) Nippon India Gold Savings fund B) Nippon India ETF Gold BeES C) 24 karat Gold Coins
Profits (refer table 3)	Greater profits are preferred,	Rs.267952.9	Rs. 282677.69	Rs. 276116.73	Rs. 329761.36	Sovereign Gold Bond Scheme
Usage as collateral for a loan	The more easily the financial institutions provide loan, the better it is.	Not all financial institutions use it as collateral.	Not all financial institutions use it as collateral	Gold loan is provided over it by financial institutions.	Loan is provided by keeping the Sovereign Gold Bonds as collateral.	A) 24 karat Gold Coins B) Sovereign Gold Bond Scheme
Discount on purchase	Greater discounts are preferred.	NIL	NIL	NIL	In online mode, discount of Rupees 50 per gram is given.	Sovereign Gold Bond Scheme

PARAM-ETER	BASIS OF CHOSING THE GOLD INVESTMENT	NIPPON INDIA GOLD SAVINGS FUND	Nippon India ETF Gold BeES	24 karat Gold Coins	SOVEREIGN GOLD BOND SCHEME	INVESTMENT CHOSEN BASED ON THE PARAMETER
Making and wastage charges	Lesser making and wastage charges are preferred.	NIL	NIL	On sale, as well as purchase, these charges are applicable	NIL	A) Nippon India Gold Savings fund B) Nippon India ETF Gold BeES C) Sovereign Gold Bond Scheme
Investment limit	Lesser or no investment limit is preferred	Unlimited	Unlimited	Unlimited	Minimum 1gram. Maximum investment is 4 kgs for individuals and HUFs and 20 kgs for other entities.	A) Nippon India Gold Savings fund B) Nippon India ETF Gold BeES C) 24 karat Gold Coins
Lock-in period	Lesser or no lock-in period is preferred.	NIL	NIL	NIL	It has a lock-in period of 8 years. It can be redeemed after a period of 5 years.	A) Nippon India Gold Savings fund B) Nippon India ETF Gold BeES C) 24 karat Gold Coins
OUTCOMES OF DIFFERENT CAPITAL BUDGETING TECHNIQUES						
Payback period method	Lower pay-back period is preferred.	7.27 years (refer table 5)	7.26 years (refer table 5)	7.37 years (refer table 5)	7.2 years (refer table 5)	Sovereign Gold Bond Scheme
Discounted payback period method	Lower discounted pay-back period is preferred.	7.58 years (refer table 7)	7.56 years (refer table 8)	7.68 years (refer table 9)	7.45 years (refer table 6)	Sovereign Gold Bond Scheme
Net Present Value method	Higher Net Present Value is preferred.	Rs. 71834 (refer table 10)	Rs. 78710.48 (refer table 10)	Rs. 62,346.51 (refer table 10)	Rs. 104693.56 (refer table 10)	Sovereign Gold Bond Scheme
Profitability index method	Higher profitability index is preferred.	1.72 (refer table 11)	1.79 (refer table 11)	1.47 (refer table 11)	2.05 (refer table 11)	Sovereign Gold Bond Scheme

PARAMETER	BASIS OF CHOOSING THE GOLD INVESTMENT	NIPPON INDIA GOLD SAVINGS FUND	Nippon India ETF Gold BeES	24 karat Gold Coins	SOVEREIGN GOLD BOND SCHEME	INVESTMENT CHOSEN BASED ON THE PARAMETER
Internal Rate of Return method	Higher Internal Rate of Return is preferred.	18.34% (refer table 13)	18.79% (refer table 14)	17.08% (refer table 15)	20.51% (refer table 12)	A) Sovereign Gold Bond Scheme

3.3.1. Summarising The Results Of The Above Table

Table 17: Summarising the results derived from the table number 16

TYPE OF GOLD INVESTMENT	NUMBER OF TIMES THE INVESTMENT HAS BEEN CHOSEN BASED ON THE IDENTIFIED PARAMETERS
Nippon India Gold Savings Fund	8
Nippon India ETF Gold BeES	8
24-karat gold coins	6
Sovereign Gold Bond Scheme	16

3.3.1. Data interpretation and analysis

- Twenty parameters, which includes qualitative as well as quantitative parameters, are considered for the purpose of this research. This would help understand the different factors that would impact an investor's gold-investment decisions.
- Every investor would judge the gold-investments based on the parameters that is relevant to him or her. Thus, the important parameters have been identified and the gold-investments are judged based on the identified parameters.
- After the gold-investments are judged based on the identified parameters, a count of the number of times a gold-investment has been chosen by the identified parameters has been made in table number 17.
- Sixteen of the identified parameters, suggest to invest in the 'Sovereign Gold Bond Scheme', whereas only six of the identified parameters suggest the investment in '24 karat Gold Coins'. In the case of 'Nippon India Gold Savings Fund' and 'Nippon India ETF Gold BeES', eight parameters each suggests investing in them. Thus, it can be concluded that 'Sovereign Gold Bond Scheme' is the best gold investment option.
- Investors can consider some or all of the parameters to finally make a gold-investment decision. For some investors, returns might be the main parameter to

be looked at whereas for some investors liquidity might be an important parameter. Thus, the research focuses on each parameter as well as all parameters together to help investors take a right decision based on their situations, circumstances and priorities.

- (f) Investment in ‘Nippon India Gold Savings Fund’ and ‘Nippon India ETF Gold BeES’ is suggested by the same eight parameters, so if a choice has to be made between them, we can refer to the parameters such as returns, profits, Internal Rate of Return method, payback period method, profitability index method and Net Present Value method to compare and decide. In all these suggested methods, ‘Nippon India ETF Gold BeES’ is the better one. But if any investor doesn’t prefer dealing in the stock market or having a dematerialised account or wants to invest in mutual fund only, they can always choose ‘Nippon India Gold Savings Fund’.

4. Results and Discussion

Majority of the parameters suggest to invest in the ‘Sovereign Gold Bond Scheme’, indicating it to be the optimal investment option, when all the twenty parameters of the research are considered. Sixteen parameters consider it as the best investment option. Thus, if investors take into account all the parameters, it is best to invest in this Government of India backed scheme. The investors can refer to a specific parameter or parameters of their choice or refer to all the given parameters to make an investment decision. When all parameters are considered, the ‘Sovereign Gold Bond Scheme’ is the clear winner. But when individual parameters are considered from table 16, the investment decisions can be customised according to the individual requirements and judgements. All the 7 quantitative parameters, that is, returns, profits, pay-back period method, discounted pay-back period method, Net Present Value Method, Profitability Index, and, Internal Rate of Return Method, recommend investing in Sovereign Gold Bond Scheme. Additionally, 9 out of 13 qualitative parameters also advocate investing in it.

The same seven qualitative parameters propose investing in Nippon India Gold Savings Fund and Nippon India ETF Gold BeES. Hence, to compare which among the two is better we can check the figures of the 7 quantitative parameters. When only two of them are compared all the quantitative parameters indicate Nippon India ETF Gold BeES to be a better investment option. Six qualitative indicators advise investing in 24-karat Gold Coins, making it the least attractive gold investment option amongst the four.

5. Limitations, Future Scope, and Conclusion

5.1. Limitations

- (a) The research doesn't focus on gold-investments from a short-term perspective. It focuses on gold-investments only from a long-term perspective.
- (b) As there is no fixed making and wastage charges in India, it had to be assumed. Whereas, it could vary in reality depending upon the jewellers or the company selling or buying gold.
- (c) Discount of Rupees 50 per gram on 'Sovereign Gold Bond Scheme' is received if done through the online mode, which has not been taken into consideration. The returns and profits generated would be higher if it was assumed that the bonds have been purchased online.

5.2. Scope of Future research

- (a) In future even more extensive research can be conducted by adding more gold investments like digital gold, jewellery made of 22-karat gold, gold option, etc.
- (b) The research could also include markets other than India, to find the optimum gold investment option worldwide.
- (c) This research is done from a long-term perspective. In future, the research can be conducted from a short-term perspective to find the optimal gold investment option in the short-run.

5.3. Conclusion

The research successfully establishes the differences between the various gold-investment options by the identification and analysis of twenty parameters. These parameters help in judging the Gold-investments from different perspectives that will be useful for the investors in making informed decisions by considering either certain specific parameters of the investor's choice or by considering all the parameters given. The four Gold-investment options considered in the research are the 'Sovereign Gold Bond Scheme' (issued by the Reserve Bank of India on behalf of the Government of India), Gold Funds represented by 'Nippon India Gold Savings Fund' (a mutual fund scheme), Gold Exchange Traded Funds represented by 'Nippon India ETF Gold BeES' (traded in the stock exchange) and purchase of physical gold represented by '24-karat Gold Coins'. Sixteen of the twenty identified parameters suggest the 'Sovereign Gold Bond Scheme' to be the best Gold-investment option. Only six parameters suggest

investing in '24-karat Gold Coins'. While, the same eight parameters suggest investing in 'Nippon India Gold Savings Fund' and 'Nippon India ETF Gold BeES'. Therefore, after taking into account all the factors, we can come to the conclusion that the 'Sovereign Gold Bond Scheme' is the most optimal gold-investment option. Taking into account all the factors, this research strongly recommends to invest in the 'Sovereign Gold Bond Scheme' and not to invest in '24-karat Gold Coins'. This advice is provided because the majority of the factors favour the "Sovereign Gold Bond Scheme" whereas the majority of the factors discourage buying "24-karat Gold Coins."

All the quantitative methods used, highly recommend the 'Sovereign Gold Bond Scheme'. Even 9 out of 13 qualitative parameters are in its favour. In the case of '24-karat Gold Coins', only 6 qualitative parameters suggest investing in it. No quantitative parameter favours it. Hence, the research advises to not invest in '24-karat Gold Coins', when the investments are purely done with a long-term gold-investment perspective. In the case of 'Nippon India ETF Gold BeES' and 'Nippon India Gold Savings Fund', same eight qualitative parameters recommend investing in it. No quantitative parameters suggest investing in both. Although, it is an interesting fact that, all the quantitative parameters have ranked 'Nippon India ETF Gold BeES' as the second-best investment option. Hence, when a choice has to be made between 'Nippon India ETF Gold BeES' and 'Nippon India Gold Savings Fund', this research suggests investors to invest in 'Nippon India ETF Gold BeES'. Therefore, we can conclude that the null hypothesis is true, that is, the 'Sovereign Gold Bond Scheme' is the most optimal long-term gold-investment option out of all the sampling units considered in the research.

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