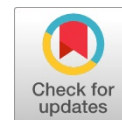


Forecasting The Demand for Gold in India: An Analysis of Historical Time-Series Data



Ajay Shukla, Shrasty Katiyar

Abstract: Gold has been an integral part of Indian culture and tradition for centuries. India is one of the largest consumers and importers of gold in the world, with gold demand primarily driven by weddings, festivals and religious ceremonies. In recent years, gold has also emerged as an investment asset class with people investing in gold for long-term gain and to hedge against inflation. Gold is also considered as a safe haven asset and is often used as a store of value during economic and political uncertainties. Almost all the central banks hold gold as a crucial part of their foreign currency reserve. Hence forecasting the demand for gold becomes essential to make informed investment decisions, management of reserves by the institutions etc. This study aims to forecast the demand for gold on the basis of the recent trends and patterns of demand for gold in India in the last five years (2017-2021). The researcher analysed historical data on gold from various sources and examined the trends over time. The study used the linear trend analysis method to create a linear equation that predicted future gold demand based on past gold demand trends. The results obtained by this research can be applied by the investors, goldsmiths and government; in various contexts, including investment and commodity trading to make informed decisions.

Keywords: Gold, Demand, Forecast, Trend & Patterns, Linear Trend Analysis, India.

I. INTRODUCTION

Humankind has been fascinated by gold since it has been discovered. The rarity of gold among metals makes it one of the most precious metals in the world. With its Midas touch; gold has shaped history, science, literature and every other area of human endeavour. For instance, the pursuit of gold has led to many adventurous explorations, battles and invasions that have altered the course of history. Shining, malleable and simple to work with; gold has been hailed as the most attractive chemical element. For thousands of years, its alluring beauty has made it ideal for use in jewellery, coins, artwork and a variety of industrial applications. Since its provenance, gold is considered the crux of all economies. Gold is one of the earliest pure metals that human civilisation has used. Throughout history, gold has arguably been valued in more regards than any other metal, serving as a symbol of strength, beauty, purity and prosperity in almost every element of modern society.

Manuscript received on 19 March 2023 | Revised Manuscript received on 28 March 2023 | Manuscript Accepted on 15 April 2023 | Manuscript published on 30 April 2023.

*Correspondence Author(s)

Ajay Shukla, Professor, Shri Jai Narain Misra Post Graduate College University of Lucknow (U.P), India.

Shrasty Katiyar*, Research Scholar, University of Lucknow (U.P), India. E-mail: shrasty.katiyar.23@gmail.com, ORCID: <https://orcid.org/0000-0003-3305-4833>

© The Authors. Published by Blue Eyes Intelligence Engineering and Sciences Publication (BEIESP). This is an open access article under the CC-BY-NC-ND license <http://creativecommons.org/licenses/by-nc-nd/4.0/>

Retrieval Number: 100.1/ijmh.H1597049823

DOI: 10.35940/ijmh.H1597.049823

Journal Website: www.ijmh.org

Gold has both government and private demand. In the era of gold standards, the government's demand for gold was monetary gold. But in the post-gold standard era, government gold demand became insignificant. But the central bank of the countries keeps a substantial amount of gold among themselves as a strategic asset. On the other hand, private demand for gold has become more extensive. Private demand can be segmented further on the basis of many factors. One such criterion is an investment that includes gold bullion, bars, ETFs, etc. (Dubey & Hardia, 2014 [3])

Gold has major cultural, social and religious significance for Indians which leads them to the altar of gold irrespective of their financial and social standing. Another major reason for the popularity of gold among Indians is that, unlike other investment instruments that leave paper trails, investment in gold is rather simple and easily comprehensible for the illiterate and semi-literate people of India. (Kuriakose & Iyer, 2015 [2])

Consumers in India are willing to pay any amount for gold in India. This affinity for gold goes against the law of demand because people perceive it as more of a status symbol and worthy investment instead of a luxury good. (S.Periyasamy, 2016 [4]).

In addition to its inherent beauty, gold is highly valued for its rarity, versatility and simplicity and adaptability. Practically every aspect of contemporary life makes use of gold. As a matter of fact, by discretely allocating gold as a foundation asset in the portfolio which already includes diversified investments such as private equity, hedge funds, real estate, etc.; investors can have a noteworthy increment in their risk adjusted returns and preserve their capital more efficiently, especially in the times of political and financial turmoil. (Dr Sindhu, 2013 [1])

A. The utilisation of the World's most coveted metal-

In the modern world, gold is used for a myriad of applications. (Bullionbypost,2021[6]) Its numerous diverse qualities, some of which are unique to gold; make it one of the most sought metals in the world. (Mining for school, 2021 [7]) Traditionally gold has been used to make coins, jewellery, and artworks, but in recent years it has also been employed in several unconventional fields:

- Jewellery:** Gold is a popular material for making jewellery due to its attractive appearance and durability. It is used to make rings, necklaces, bracelets, earrings, and many other types of jewellery.
- Investment:** Gold is widely considered a safe-haven asset, and many people invest in gold as a way to diversify their portfolios and protect against economic and political uncertainties.



Published By:
Blue Eyes Intelligence Engineering
& Sciences Publication (BEIESP)
© Copyright: All rights reserved.

Forecasting The Demand for Gold in India: An Analysis of Historical Time-Series Data

- c) **Electronics:** Gold is an excellent conductor of electricity and is used in a variety of electronic devices, such as computers, cell phones, and televisions.
- d) **Dentistry:** Gold has been used in dentistry for many years to make dental crowns, bridges, and other dental restorations.
- e) **Medicine:** Gold nanoparticles are being studied for their potential use in targeted drug delivery and cancer treatment. Gold is also used in some medical implants, such as pacemakers.
- f) **Currency:** Gold has been used as a form of currency for thousands of years and is still used in some countries as a form of currency or as a backing for paper currency.
- g) **Art:** Gold leaf is used in many forms of art, including painting, sculpture, and architecture.
- h) **Aerospace:** Gold is used in some aerospace applications due to its excellent thermal and electrical conductivity, as well as its resistance to corrosion.

Overall, gold is a highly versatile and valuable metal that has a wide range of applications in many different fields.

II. RESEARCH METHODOLOGY

Demand forecasting is a process to predict the future demand for a product/commodity based on historical data. The predicted demand can only be reliable if the forecast is made in a systematic and scientific manner. To ensure the reliability of the forecast made, the researcher will follow the OTMCR Approach:

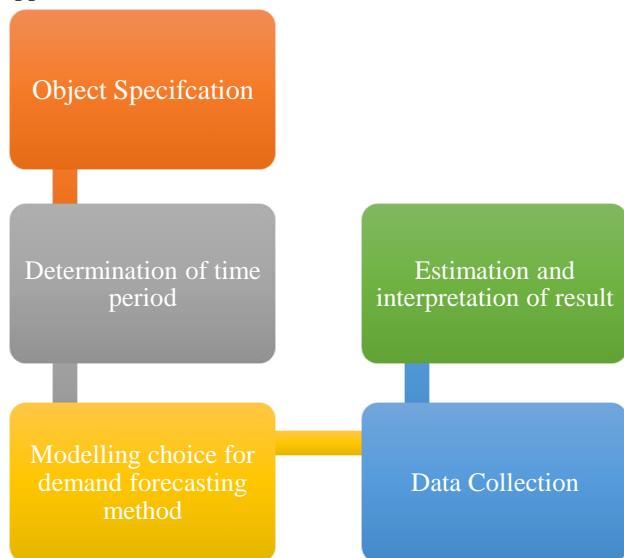


Figure-1: Research Approach

A. Objectives-

This study aims to forecast the demand for gold on the basis of the recent trends and patterns of demand for gold in India in the last five years (2017-2021).

B. Time period

The researcher attempts to predict the demand for gold for the period of the next five years i.e. (2022-2027) based on the historical data of the last 5 years (2017-2021).

C. Method of demand forecast:

The researcher will use a statistical method to forecast the demand for gold in India. The estimates made by using statistical methods are relatively more reliable than the other methods of demand forecasting as it utilises the historical time series data in which the element of subjectivity is minimum. (Dwivedi, D.N. 2016 [8])

There are various kinds of the statistical method used for demand forecasting:

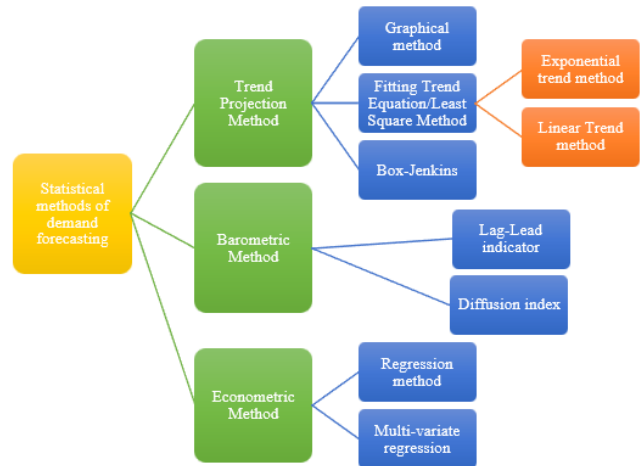


Figure-2: Kinds of statistical methods of demand forecasting

D. Tools & techniques:

The researcher has used the linear trend method for forecasting the demand for gold in India. The reason is the rising trend of the demand for gold in the last five years i.e. from the year (2017-2021).

E. Data and the source of data-

This study is purely based on secondary data. To forecast the future trends and patterns of gold demand in India; the data was collected from various secondary sources like journals, books, newspapers, articles, etc.

The major data sources of the study are the reports of the World Gold Council and the Indian Bullion Market

Table-1: Demand for gold

Year	Demand for Gold (Y)
2017	4278.2
2018	4449
2019	4344
2020	3658.8
2021	4021.8
Total	20751.8

(Source: World Gold Council [5])

III. ESTIMATION AND INTERPRETATION OF RESULT

When the historical time series data reveals the rising trend the following straight-line equation is formulated-

$$Y = a + bx$$

Where Y= The demand for gold

X= Time (Year)

a,b= Constant



(The parameter b gives the measure of the annual increase in the demand for gold in India over years i.e., time)
The co-efficient a and b are estimated by solving the following two equations which are based on the following principle of the least square method-

$$\sum Y = na + b\sum x \quad \dots(i)$$

$$\sum Yx = a\sum x + b\sum x^2 \quad \dots(ii)$$

Table-2: Estimation of trend equation
(in tonnes)

Year	Demand for Gold (Y)	Time (X)	X ²	XY
2017	4278.2	1	1	4278.2
2018	4449	2	4	8898
2019	4344	3	9	13032
2020	3658.8	4	16	14635.2
2021	4021.8	5	25	20109
Total	20751.8	15	55	60952.4

$$\sum Y = na + b\sum x \quad \dots(i)$$

$$5a + 15b = 20751.8$$

$$\sum Yx = a\sum x + b\sum x^2 \quad \dots(ii)$$

$$15a + 55b = 60952.4$$

To solve the above equations, the constant value 3 is used to multiply the equation (i):

$$(5a + 15b = 20751.8) \times 3$$

$$= 15a + 45b = 62255.4 \quad \dots(iii)$$

To calculate the value of parameter b; equation (iii) is to be subtracted by equation (i):

$$15a + 55b = 60952.4$$

$$(-) 15a + 45b = 62255.4$$

$$-10b = -1303$$

$$b = 130.3$$

By Putting the value of b parameter (130.3) in equation (i) the value of parameter a is calculated as 3759.46.

Using the values of the parameter, a & b in the equation $Y = a + bx$, where "x" is the year to be forecasted; we get the trend equation as-

$$Y = 3759.46 + 130.3x$$

Having estimated the parameters of the trend equation, the forecast of the demand trend of the gold for next five years i.e., from 2022-2027 has been calculated as follows-

Table-3: Demand forecast by using the linear trend method
(In tonnes)

Year	2022	2023	2024	2025	2026	2027
Predicted Demand for Gold	4541.26	4671.56	4801.86	4932.16	5062.46	5192.46

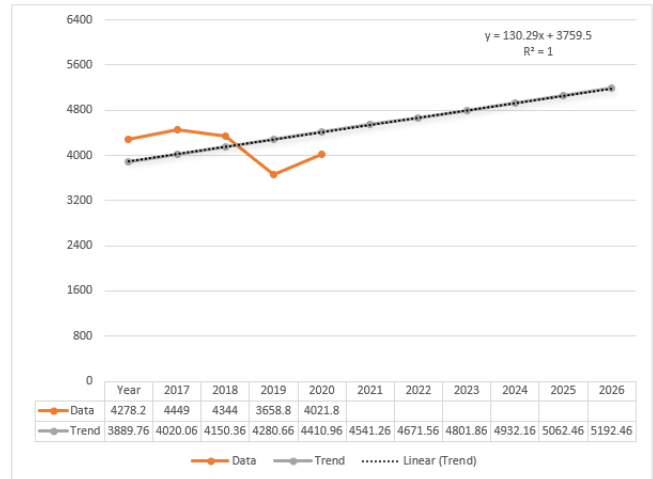


Figure-3: Trend projection using the graphical method

Table-4: Trend Projection in tabular format
(In tonnes)

Year	Actual Demand	Trend
2017	4278.2	3889.76
2018	4449.0	4020.06
2019	4344	4150.36
2020	3658.8	4280.66
2021	4021.8	4410.96
2022	-	4541.26
2023	-	4671.56
2024	-	4801.86
2025	-	4932.16
2026	-	5062.46
2027	-	5192.46

The result of the study indicated that gold demand has been increasing over time, with a steady upward trend observed in the historical data with occasional dips and spikes. The linear trend analysis method predicted that the rising trend would continue with gold demand expected to increase in the future. The result of the research could be used by investors, traders and other stakeholders to make informed decisions about gold investment and other related activities.

IV. CONCLUSION

Based on the historical data trends, the demand trend for gold seems positive in the upcoming future. As mentioned earlier, gold has been considered a safe haven asset during times of economic uncertainties and political instability. In addition, gold is also used in various industrial applications and is an important component in the electronics industry. However, it is also of vital importance to understand that the demand for gold is also influenced by several other factors like central bank policies, interest rates, share market, inflation rates, etc., which are subject to frequent changes. Therefore, while historical trends suggest that the demand for gold may increase in near future, it is difficult to predict with certainty. Overall, it is important to monitor economic and political developments that may affect the demand for gold in India. This can help investors to make informed investment decisions with respect to gold.



DECLARATION

Funding/ Grants/ Financial Support	No, we did not receive any grant.
Conflicts of Interest/ Competing Interests	No conflicts of interest to the best of our knowledge.
Ethical Approval and Consent to Participate	The article does not require ethical approval and consent to participate with evidence.
Availability of Data and Material/ Data Access Statement	Not relevant.
Authors Contributions	All authors have equal participation in this article.

REFERENCES

1. Dr Sindhu (2013), "A study on impact of select factors on the price of Gold" IOSR Journal of Business and Management (IOSR-JBM) e-ISSN: 2278-487X. Volume 8, Issue 4 PP 84-93 [\[CrossRef\]](#)
2. Francis Kuriakose & Deepa Kylasam Iyer (2015), "Managing gold-examining India's gold rush, its causes and concerns with suggestions for a sustainable gold policy" <http://ssrn.com/> [\[CrossRef\]](#)
3. Sheetal Dubey & Anamika Hardia (2014), "Demand & Supply Trends of Sparkling Metal" *International Journal of scientific research and management* Volume 2 Issue-2 Page- 573-578 ISSN (e): 2321-3418
4. S. Periyasamy (2016), "A case analysis of demand and supply of gold in India". *EPRA International journal of research and development* ISSN: 2455-7838
5. Historical demand and supply (2023) <https://www.gold.org/goldhub/data/gold-demand-by-country>
6. Uses of gold <https://www.bullionbypost.co.uk/index/gold/uses-of-gold/>
7. Uses of gold <https://www.miningforschools.co.za/lets-explore/gold/uses-of-gold>
8. Dwivedi, D.N. (2016) *Managerial Economics* (8th Edition). Vikas Publishing house private limited

AUTHORS PROFILE



Prof. Ajay Shukla is Principal at Samta PG College, Ghazipur and also an author of 15 books with various national and international publications. Prof Shukla has 49 research paper publications in different peer-reviewed and UGC Care listed Journals and has organised numerous national and international workshops and seminars. Prof Shukla is also the Counsellor of the Indian Institute of Cost Accountants of India, Lucknow chapter and Punjab National Bank regional training centre, Lucknow. He is also a member of the Indian Accounting Association Executive Committee, North zone. Prof Shukla was honoured with Shikshak Shree Award in 2017.



Shrasty Katiyar is assistant professor in the faculty of commerce at Pt. Prithi Nath College, Kanpur. She has qualified NET- JRF in commerce and is pursuing her PhD in finance from the University of Lucknow under the guidance of Prof. Ajay Shukla. Her research interests are- behavioural finance, Gold, Investor behaviour, and commodity market.

Disclaimer/Publisher's Note: The statements, opinions and data contained in all publications are solely those of the individual author(s) and contributor(s) and not of the Blue Eyes Intelligence Engineering and Sciences Publication (BEIESP)/ journal and/or the editor(s). The Blue Eyes Intelligence Engineering and Sciences Publication (BEIESP) and/or the editor(s) disclaim responsibility for any injury to people or property resulting from any ideas, methods, instructions or products referred to in the content.