

Gold Market Anomalies: A Study Of Indian Spot Market Of Gold And Gold Futures

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Abstract

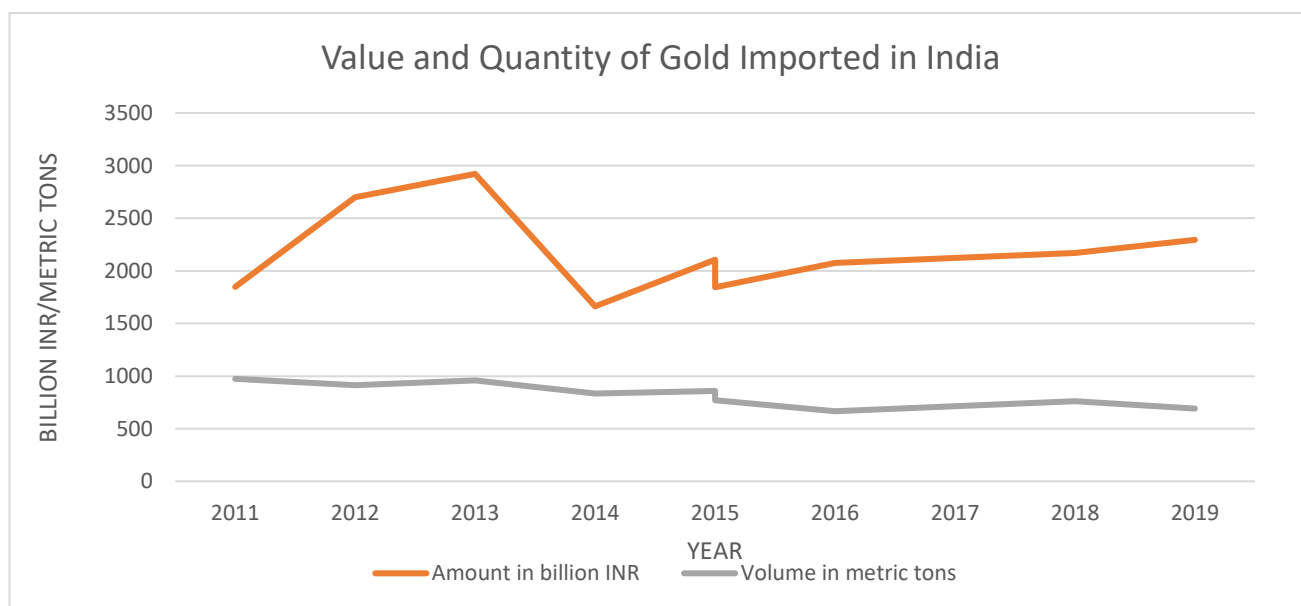
The objective of the study was to find out anomalies in the spot market of gold and gold futures in India. Telephonic interview of the jewellers and correlation was used in the study. The study found anomalies in the spot market of gold in India. Also, study showed no anomalies in the gold futures market. It is concluded customers in the gold market need to be aware of the quality and prices of the gold.

I. Introduction:

India is one of the largest importers of gold as gold has significant importance in all the traditions, rituals and customs of the Indian culture. Gold is considered as the safest investment, particularly in the recession and is also used to hedge against inflation. The market where buying and selling of gold take place is also known as the bullion market, these markets are spread across the globe and are characterised as over-the-

counter markets (Chen, 2019). India had the 10th largest reserve of gold in 2019 (Jayakumar, 2019). Also, India has a huge historical background that represents the influence of gold on its culture. Starting from the South, Thiruvananthapuram houses the famed Padmanabhaswamy Temple is the richest temple the whole world. After estimations, Padmanabhaswamy Temple contains gold worth around ₹120,000 Crore (Dobson, 2015).

Figure 1 Value and quantity of gold imported from 2011-2019.



(source: www.businesstoday.in)

In Figure 1, the X-axis represent time (in years) and Y-axis represents the amount in billion INR and volume in metric tons in Figure 1. The amount is represented in red and volume in grey colour respectively. It is verily understood by the graph that the quantity of imports has decreased each year starting from 2011-2019 whereas the prices have risen gradually, being highest during in 2013 where the amount paid rose up to ₹2921.53 billion in comparison to the volume that went down to 958.58 metric tons. The figure shows that the imports are declining due to excessive prices in the international market which makes it imperative to find out the relationship between the Indian and international gold markets in order to understand the effect of the international market on the Indian gold markets as well. This study is aimed to understand the anomalies prevalent in the spot and gold futures market at local and national level so that the hedgers, speculators as well as the laymen aware of various aspects of the gold market in India.

While conducting a study about the gold market, a lot of research has been done over the strategy and fundamentals that help in pricing this precious metal and most of the studies have taken the strong western and/or European markets into consideration ignoring the small and growing markets for gold. Ntim et al., 2015 investigate how the volatilities in macroeconomic fundamentals explains the predictability of global daily spot gold price return series. Price determination of gold is supposedly done for spot as well as futures. Hence, it is important to take it into consideration if the price of the future can be used to forecast the spot rate. One of the basic criteria to understand the price of gold is the demand and supply. Selvanathan & Selvanathan, (1999) empirically showed the positive relationship between price and Western Australian gold production between 1948 and 1994. They found positive relationship between real price of gold and volume produced in long run. Apart from that, there are a number of models that help us understand the pricing strategies of this market. Gold prices are almost always linked with the prices of crude oil and inflation, and the positive correlation between gold and crude oil and negative correlation between gold and inflation was found to be in place in the longer run, hence the Long-term trend reverting jump and dip diffusion model was introduced (Shafiee & Topal, 2010). Pavabutr et al., (2008) using daily observations between 2003 and

2007 looked at the price discovery process of the Multi Commodity. Results of the study show that standard and mini futures contracts, and spot prices are most important in price discovery.

While looking for the research available on the gold market, the biggest pie in the cake belongs to the researchers done their study on the pricing strategies and macro as well as microeconomic fundamentals governing the price of gold in the market. A lesser chunk can be traced when it comes to research done on the prevalent anomalies. This study tries to understand why this market is seller dominant and find out anomalies in the local, national as well as international gold market. The study can help the layman who has little knowledge of the various operations of the gold market and can also help other players in the market, so that they can invest more sensibly to earn profits and be safe.

2. Objective and Methodology

The objective of the study is to find out anomalies in the spot market of gold at the national and local levels. Besides this the anomalies in gold futures market at national and international level also explored.

The primary data was collected by means of telephonic interview. India's top 30 jewellers (Dulhaniyaa desk, 2020) at the national level were selected for the purpose but only 17 responded. The responses were limited due to unavailability of the required information from certain jewellers as some of them were unable to reach and others considered it against their company policy to give the required information over a telephonic conversation. The questions were asked with respect to the bid-ask spread of prices of gold for 24, 22 and 18 carats. Besides this the percentage of deduction that the jewellers charge for buying back old gold was trying to be assessed.

The secondary data was collected from various websites such as

1. Data with respect to monthly gold price in INR and USD per ounce was taken from the official website of the world gold council. ([World Gold Council, 2020, November 11](#))
2. Exchange rate from [exchangerates.org](#). (Exchange Rates UK, n.d.)

3. Gold futures contracts in USD from macrotrends. ([Macrotrends, n.d.](#))
4. Gold futures contracts in INR from investing.com. ([Investing.com, n.d.](#))

Data was collected for a period of six years ranging from 2014-2020.

2. Data Analysis

Anomalies in the gold futures market: In order to find anomalies, the correlation between prices of gold futures in INR and USD is calculated. Other variables such as Indian Premium and Discount Rates are represented with the help of graphs to observe their trend and see if there is any deviation from the standards.

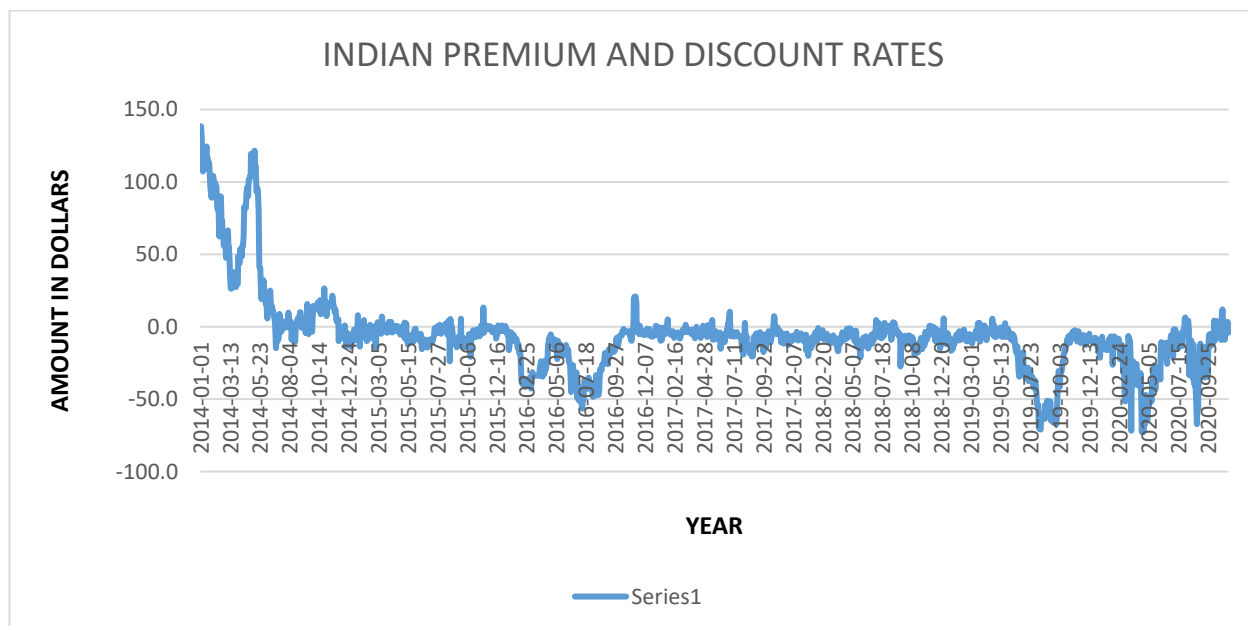
2.1 Prices of Indian gold future from 2014-2020:

Like any other commodity, gold is also traded in the form of futures contracts where the buyer and seller

enter a legal agreement for delivering the asset and payment of the price at a future date. It helps the hedgers to hedge risk of fluctuations in prices and also helps speculators or arbitrageurs to earn profit by predicting future prices. The study shows that correlation between gold futures in INR and USD equal to 0.97. The T-test also shows that the correlation is significant.

2.2 Indian premium and discount rate: During normal course of trade of gold in the international market, the gold in India is either traded at premium or discount i.e., when the price of gold traded in the native markets is higher than in the international markets, the trade is trading at premium and when the native markets priced the metal lower than the international markets, it is trading at discount. Figure 4 tries to show Indian premium and discount rate from 2014-2018.

Figure 2: Indian premium and discount rate from the year 2014 to 2018 can be graphically represented as:



(source: www.gold.org)

Figure 2 represents Indian premium and discount rates from January 2014 to October 2020. The gold has been trading at premium initially hitting the highest mark at \$138/troy oz on 1st January, 2014 and thereof a constant decline to encounter its first dip on 1st July, 2014 at \$ -7.7/troy oz. The market afterwards has traded on discount with gradual fluctuations and minimal upward movements. The biggest dip was

seen on 17th April, 2020 when the market traded at a discount of \$ -72.7/troy oz.

2.3 Anomalies in spot market at national level:

The data gathered with respect to the spot prices of Indian gold market is put to analysis using linear regression and correlation. The data is analysed in order to find out the relationship that exists between

Indian and international markets, assess any kind of anomaly present and try to find out reasons for the same. Firstly the correlation between the spot price of gold in INR and USD is examined. Further, the bid-ask spread in the national spot market and the quantum of deviations from the standard price set by the regulatory authorities or organisations are studied.

2.1.1 Relationship between gold spot prices in INR and USD: This relationship is assessed by calculating correlation analysis between gold spot price in INR and USD by evaluating data for a period

of six years ranging from 2014-2020. The study found strong significant correlation of 0.96 between gold spot prices in INR and USD.

2.1.2 Assessment of price deviations in the spot market: On the basis of data gathered from various jewellers at national level with the help of telephonic interview, various price anomalies such as deviation from the standard price set by IBSA (India Bullion and Jewellers Association Ltd.) and the bid-ask spread are shown in Table 1.

Table 1: Price of gold as on 12-11-2020

S.no	Price set by IBSA for 24carat	Price set by IBSA for 22carat	Price set by IBSA for 18carat	Price asked by jewellers for 24carat	Price asked by jewellers for 22carat	Price asked by jewellers for 18carat	Price offered by jewellers for 24carat	Price offered by jewellers for 22carat	Price offered by jewellers for 18carat
1	₹50702	₹46443	₹38027	₹ 51,500	₹ 47,200	₹ 38,610	₹ 51,500	₹ 47,200	₹ 36,679
2	₹50702	₹46443	₹38027	₹ 53,660	₹ 47,200	₹ 39,140	₹ 50,750	₹ 45,784	₹ 36,791
3	₹50702	₹46443	₹38027	₹ 50,700	₹ 46,720	₹ 39,760	₹ 48,672	₹ 44,851	NA
4	₹50702	₹46443	₹38027	₹ 53,010	₹ 48,590	₹ 40,400	₹ 53,010	₹ 48,590	₹ 38,380
5	₹50702	₹46443	₹38027	₹ 54,510	₹ 49,970	₹ 40,550	₹ 54,510	NA	₹ 34,467
6	₹50702	₹46443	₹38027	₹ 56,650	₹ 47,810	₹ 39,800	NA	NA	₹ 36,417
7	₹50702	₹46443	₹38027	₹ 51,300	₹ 48,200	NA	₹ 46,700	₹ 43,862	NA
8	₹50702	₹46443	₹38027	₹ 52,500	₹ 50,000	NA	₹ 52,000	₹ 49,950	NA
9	₹50702	₹46443	₹38027	₹ 53,360	₹ 49,380	NA	₹ 49,090	₹ 43,450	NA
10	₹50702	₹46443	₹38027	₹ 58,230	₹ 50,000	NA	NA	NA	NA
11	₹50702	₹46443	₹38027	₹ 54,060	₹ 53,960	NA	NA	₹ 48,564	NA
12	₹50702	₹46443	₹38027	₹ 54,106	₹ 47,200	NA	₹ 49,507	₹ 42,600	NA
13	₹50702	₹46443	₹38027	₹ 51,520	₹ 48,650	NA	₹ 51,000	₹ 44,515	NA
14	₹50702	₹46443	₹38027	₹ 50,850	₹ 47,200	NA	NA	₹ 43,424	NA
15	₹50702	₹46443	₹38027	NA	₹ 47,200	NA	NA	NA	NA
16	₹50702	₹46443	₹38027	NA	₹ 47,100	NA	NA	₹ 42,000	NA
17	₹50702	₹46443	₹38027	NA	₹ 47,610	NA	NA	₹ 47,610	NA

(source: author's calculation)

Table 1 indicates the price set by Indian Bullion and Jewellers Association and various other prices quoted by jewellers as on 12-11-2020. The empty cells indicate the jewellers that do not deal in the said category of gold either in buying or selling. Differences between prices quoted by IBSA and different jewellers can be seen in the table. The data

collected does not only show a price deviation from standards but also the difference in prices quoted by various jewellers which proves the prevalence of anomalies in the national spot market. The deviations are prevalent in the 24-carat gold market, which highlights the domination by the jewellers in the national gold market.

Table 2: Calculation of bid-ask spread

S. No.	Price asked by jewellers for 24c (a)	Price offered by jewellers for 24c (b)	Bid-Ask spread (a-b)	Price asked by jewellers for 22c (c)	Price offered by jewellers for 22c (d)	Bid-Ask spread (c-d)	Price asked by jewellers for 18c (e)	Price offered by jewellers for 18c (f)	Bid-Ask spread (e-f)
1	₹ 51,500	₹ 51,500	0	₹ 47,200	₹ 47,200	0	₹ 38,610	₹ 36,679	1931
2	₹ 53,660	₹ 50,750	2850	₹ 47,200	₹ 45,784	1416	₹ 39,140	₹ 36,791	2349
3	₹ 50,700	₹ 48,672	2028	₹ 46,720	₹ 44,851	1869	₹ 39,760	NA	NA
4	₹ 53,010	₹ 53,010	0	₹ 48,590	₹ 48,590	0	₹ 40,400	₹ 38,380	2020
5	₹ 54,510	₹ 54,510	0	₹ 49,970	NA	NA	₹ 40,550	₹ 34,467	6089
6	₹ 56,650	NA	NA	₹ 47,810	NA	NA	₹ 39,800	₹ 36,417	3383
7	₹ 51,300	₹ 46,700	4600	₹ 48,200	₹ 43,862	4338	NA	NA	NA
8	₹ 52,500	₹ 52,000	500	₹ 50,000	₹ 49,950	50	NA	NA	NA
9	₹ 53,360	₹ 49,090	4270	₹ 49,380	₹ 43,450	5930	NA	NA	NA
10	₹ 58,230	NA	NA	₹ 50,000	NA	NA	NA	NA	NA
11	₹ 54,060	NA	NA	₹ 53,960	₹ 48,564	5396	NA	NA	NA
12	₹ 54,106	₹ 49,507	4599	₹ 47,200	₹ 42,600	4600	NA	NA	NA
13	₹ 51,520	₹ 51,000	520	₹ 48,650	₹ 44,515	4135	NA	NA	NA
14	₹ 50,850	NA	NA	₹ 47,200	₹ 43,424	3776	NA	NA	NA
15	NA	NA	NA	₹ 47,200	NA	NA	NA	NA	NA
16	NA	NA	NA	₹ 47,100	₹ 42,000	5100	NA	NA	NA
17	NA	NA	NA	₹ 47,610	₹ 47,610	0	NA	NA	NA

(source: author's calculation)

The bid-ask spread that is the price difference between the buying and the selling price of gold at national level can be examined with the help of the Table 2. It enables the reader to examine the amount of profit earned by jewellers only by paying less and charging more for the same purity of gold. The bid-ask spread for jewellers 1, 4, 5 and 17 is 0 (zero) and seems to be

the prominent choice for any buyer, on the other hand, the spread for 24-carat can be seen to range from ₹500 to ₹4600. For 22carat, jeweller 8 offers the lowest spread (₹50) while as, the highest spread is earned by jeweller 11 (₹5396). Similarly, the spread can be seen to be highest for jeweller 5 and lowest for jeweller 1 respectively.

Table 3: Price deviations from standard price set by IBJA

S. No.	Price set by IBJA for 24c (A)	Price asked by jewellers for 24c (B)	Price difference in INR (B-A)	Price set by IBJA for 22c (C)	Price asked by jewellers for 22c (D)	Price difference in INR (D-C)	Price set by IBJA for 18c (E)	Price asked by jewellers for 18c (F)	Price difference in INR (F-E)
1	₹50702	₹ 51,500	₹ 798	₹46443	₹ 48,000	₹1557	₹38027	₹ 38,610	₹583
2	₹50702	₹ 53,660	₹ 2958	₹46443	₹ 47,200	₹757	₹38027	₹ 39,140	₹1113

3	₹50702	₹ 50,700	₹ -2	₹46443	₹ 47,200	₹757	₹38027	₹ 39,760	₹1733
4	₹50702	₹ 53,010	₹ 2308	₹46443	₹ 46,720	₹277	₹38027	₹ 40,400	₹2373
5	₹50702	₹ 54,510	₹ 3808	₹46443	₹ 48,590	₹2147	₹38027	₹ 40,550	₹2473
6	₹50702	₹ 56,650	₹ 5848	₹46443	₹ 49,970	₹3527	₹38027	₹ 39,800	₹1773
7	₹50702	₹ 51,300	₹ 598	₹46443	₹ 47,810	₹1367	NA	NA	NA
8	₹50702	₹ 52,500	₹ 1798	₹46443	₹ 48,200	₹1757	NA	NA	NA
9	₹50702	₹ 53,360	₹ 2658	₹46443	₹ 50,000	₹3557	NA	NA	NA
10	₹50702	₹ 58,230	₹ 7528	₹46443	₹ 49,380	₹2937	NA	NA	NA
11	₹50702	₹ 54,060	₹ 3358	₹46443	₹ 50,000	₹3557	NA	NA	NA
12	₹50702	₹ 54,106	₹ 3404	₹46443	₹ 53,960	₹7517	NA	NA	NA
13	₹50702	₹ 51,520	₹ 818	₹46443	₹ 47,200	₹757	NA	NA	NA
14	₹50702	₹ 50,850	₹ 148	₹46443	₹ 48,650	₹2207	NA	NA	NA
15	NA	NA	NA	₹46443	₹ 47,200	₹757	NA	NA	NA
16	NA	NA	NA	₹46443	₹ 47,200	₹ 757	NA	NA	NA
17	NA	NA	NA	₹46443	₹ 47,100	₹ 657	NA	NA	NA

(source: author's calculation)

It can be clearly assessed with the help of the tabulated data that price anomalies exist at the national level as the price offered by jewellers for the sale of gold is not as per the price set by IBJA. The deviation exists in both positive and negative manner for 24-carat gold as the difference in price is as high as ₹7528 for jeweller 10 and as low as ₹-2 for jeweller 3. The range for 22-carats and 18-carats is ₹657-₹3557 and ₹583-₹2473 respectively. The missing cells in the table indicate the unavailability of data with respect to the buy/sell of a particular category of gold as various jewellers do not deal in all categories of gold and some are either reluctant to go for repurchase and/or accept exchange only, the bid-ask spread calculated in table 3 helps us to analyse the difference between the price at which the jewellers sell and buy back gold from customers and earn profits out of the difference. The arbitrageurs can easily make a profit by buying gold from the jeweller where the difference is the lowest and selling where the difference is the highest and earning risk-free profits out of the deal. Tables 1,2 and 3 helped us to analyse various anomalies with respect to spot prices at a given date. While calculating the average bid-ask spread, the percentage of the spread for 24carat amounted to 2.6% and for 22 and 18 carat was 4.44% and 6.62% respectively.

3. Major findings:

While trying to analyse the relationship between Indian and US gold futures, correlation was used. The study shows very high correlation between Indian and US gold futures. For assessing the national market, data was collected through telephonic interviews. The study showed the different bid-ask spreads by various jewellers at national level.

This study concludes that price anomalies actually exist in the Indian gold spot market and the following factors may be responsible for the same:-

1. The jewellers refuse to buy back gold at the same price at which they sell and claim a percentage deduction which goes from around 3-20% of the actual gold value.
2. The jewellers are reluctant to buy back gold which was not sold by them as they bring quality concerns into play, while as. This reluctance is a simple tool to persuade the buyer to buy gold from them and enhance their customer base only.
3. In case of buy back of gold which was not sold by the jeweller originally, they charge a higher percentage deduction. In such a case, the customer is left with no other option but to sell its gold at lower prices.
4. When the jeweller charges higher price than the rates set by IBJA, they refer to the price for which they had actually bought the gold on a given date and earn their margins

accordingly thus avoiding all possibilities of loss.

5. The giant players earn the said profit by imposing making charges that may go as high as 20% of the gold value.
6. The most important factor contributing towards the prevalence of these anomalies is lack of awareness on part of the customers.
7. Exchange offers introduced by jewellers where they offer new gold in exchange of the old. The jewellers do not consider making charges while buying back gold. While as, they charge the same while exchanging new gold for the old.

The study has some limitations as the study was a limited number of responses gathered. Some of the respondents were either unable to reach and a few considered it against the company policy to answer the questions over a telephonic conversation. Hence, the scope of this research can be widened for those who can opt for other tools of data collection through which more data can possibly be gathered.

So, in the Indian gold market, the customers should ensure the quality and purity of gold by examining the standard imprints such as BIS Hallmark and pay the price according to purity and not fall prey to exchange offers. Jewellers should earn profits but not by means of customer exploitation as it will result in the degradation of the image and goodwill of the business and sell pure BIS Hallmark certified gold and not indulge in unethical practices that may lead to punishments under laws prevailing in the country. Besides this, the authorities should bring stringent laws into practice for safeguarding the interests of the masses and spread public awareness with respect to the anomalies and ways and means by which the laymen are fooled and/or exploited by the jewellers.

4. Conclusion:

India being a home to around 450,000 gold smiths and around 1,00,000 gold jewellers along with 6000 diamond processing players and 8000 diamond jewellers provides a large market to the yellow metal trade (Indian law offices, n.d.). India is a country where gold is not only considered as a secure investment but finds itself deeply rooted in its culture, customs and traditions. The present study tried to find

out the anomalies prevalent in the Indian gold markets that could help investors including hedgers, speculators and the common masses. The study observes various factors such as the price of gold at the national and international markets, and the various anomalies present at national level affecting the price of gold. The study shows a very high correlation between Indian and US gold futures and between spot price of gold in INR and USD. The price deviation from the standard price set by IBA is highest in 18c category of gold. Study also shows no anomalies prevalent in the gold futures market.

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