

A Comparative Study of Gold Price Movements In Indian and Global Markets

* Dr. Arti Gaur

** Dr. Monica Bansal

INTRODUCTION

Since the earliest times, gold has been important for mankind. The basic reason for this being its unique physical properties. Gold as a commodity, as a currency, continues to play its ancient role as the only true standard of value in times of war or crisis. History tells us that only gold retains its value during war; change of empires and govt. and at the time of crisis. Gold is the oldest and most respected currency in the world and only one respected currency in the world when national paper money loses value. That is why every central bank of any significance buys and holds Gold in reserve in a world of almost universal paper money. The monetary use of gold, along with silver has been very wide spread since ancient times. Gold and silver coins have been the most readily acceptable medium of exchange due to the intrinsic value of the two metals. The major problem in this use of gold as a coinage metal is its short supply. It is produced only by a few countries mainly South Africa (producing 3/4th of the total world production), Soviet Union, Canada, USA, Ghana, Philippines and Australia. In India, gold has maintained an important presence since very early times.

MONETARY ROLE OF GOLD

The monetary role of gold may be analyzed by the three age-old functions of money:

- A medium of exchange
- A standard of value
- A store of value

In the shape of coins, gold has been used as medium of exchange for ages.

THE GOLD STANDARD

The Scottish philosopher David Hume first provided an insight into the monetary role of gold in the late eighteenth century in his “**Specie Flow Mechanism.**” By ‘specie’ he meant any one of the monetary metals, gold or silver. This was a ‘pure gold standard’. This system visualized free gold coinage, ready conversion of currency notes into gold at the par value, lack of restrictions on holding of gold, its international mobility and free trade. Consequently, the balance of payments flows. Since this will change the quantity of money in the economy, the levels of prices, output and employment will respond. The magnitude of these related changes will depend upon the ratios of exports and imports to the GNP of a country. This system required an adequate supply of gold in order to sustain the growth in output and trade.

The gold policy of the govt. has also led to gold sales from time to time. This as well as the policy of gold reserve management has been examined. The role of gold in India has an important fiscal aspect. A part of the demand for gold in India is related to the generation of black money. At the same time, the stock of private gold has been looked upon as a potential source for balancing the union govt. budget as well as for balancing the balance of payments. Thus, the role of gold is inseparably linked up with fiscal reform in the country.

GOLD AS AN INVESTMENT OPTION

There are many savings and investment options available in India. One of the options is gold. Gold has been valued since prehistoric times and is the investment option that has been seen as the ultimate form of safe haven investment and the only true form of wealth. Gold has been popular in India because it acted as a good hedge against inflation. There is so much uncertainty in the world in terms of economic growth and geopolitics; it is no surprise that many investors, big and small have chosen to hedge their investments through gold.

Gold is an important and popular investment for many reasons:

- Gold remains as an integral part of social and religious customs, besides being the basic form of saving.
- Gold has aesthetic appeal .Its beauty recommends it for ornament making above all other metals.
- Gold is indestructible which does not tarnish and is also not corroded by acid-except by a mixture of nitric and hydrochloric acids.
- Gold is a currency that has no borders and does not need to be honoured by any governmental obligations.

* Lecturer, Department. Of Business Administration, Ch. Devi Lal University, Sirsa-125055, Haryana

** Lecturer, Department Of Management Studies, Jan Nayak Ch. Devi Lal Vidyapeeth, Sirsa-125055, Haryana. Email: monikabansal22@gmail.com

- Gold has long proven ability to retain value and appreciate in value. Gold is readily available in a standardized form.

GOLD BETTER THAN EQUITIES

According to the World Gold Council, investing in gold is considered to be safer than traditional investments in equities and bonds since gold is the commodity where the price is determined by various factors apart from its demand and supply. Also, it is a commodity that is priced in US Dollars as against our local currency. The factors that affect the price of gold are rather different from factors that affect other assets like say domestic fixed deposits. Inflation will have no impact on the price of gold, other factors remaining the same, thereby lending support to your wealth. In fact, in times of inflation, more money tends to move to gold, thereby driving up its price. The last few years show a steep rise in oil prices resulting in a rise in inflation not only in India but globally. The impact has been varied across countries depending on factors such as economic cycle and oil consumption. This general price rise has added to the attractiveness of gold.

In other words, when the stock market crashes or when the dollar weakens, gold continues to be a safe haven investment because gold prices rise in such circumstances.

GOLD INVESTMENT OPTIONS

Not many people know that there are various investment options in gold like gold bars, numismatic coins, and gold accumulation plans by banks and financial institutions, and gold mutual funds. Across the world, several investment options are available for investors to put their money in the yellow metal.

- **Gold savings accounts:** They operate like regular bank accounts where the customer's account is credited with balances of gold and withdrawals can be either in the form of gold coins or currency equivalents.
- **Gold accumulation plan:** A monthly debit from customer's savings account is backed by 100 percent Physical gold.
- **Gold chits:** Also there are gold chits run by jewelers where at the end of the year, housewives can buy gold jewellery or coins from the same jeweler worth the total money they have paid in instalments.
- **Gold deposit scheme:** It is one of the options to invest in gold where one can keep gold in banks for a specified period like a fixed deposit and can claim as and when required. But it is not like pledging as the ornaments will not be returned in its original form because the banks melt them and rent them to the industry.
- **I-gold:** An investor can purchase gold from a stock broker just as he used to buy equity shares.
- **Mutual funds** and Buying gold as ornaments are other options.

Realizing the potential for Gold as a safe investment option the World Gold Council has made several suggestions regarding this matter. These include allowing banks to offer gold backed investment products and gold loans to local jewellers.

OBJECTIVES OF THE STUDY

The main objectives of the present research are:

- To study the trend of gold price movements in the post liberalization period and its relationship with international prices.
- To find out the correlation between gold prices in both the markets.
- To study the impact of changes in foreign exchange rates on the gold prices in Indian as well as in the international market.

RESEARCH METHODOLOGY

❖ STATISTICAL HYPOTHESIS

Since the basic objective of this work is to study the trend of gold price movements in the post-liberalized period in the Indian and International (London) market, it describes the characteristics trend line of the prices of gold during the period under study. Because of this variation, the focus is on hypothesis testing. Hypothesis testing has been done only for the following cases:

- To test the significance of the value of Karl Pearson co-efficient of correlation between gold prices in Indian Gold Market and International Gold Market. To test it, the following hypothesis has been developed:
 H_0 : There is no correlation between gold prices in Indian Gold Market and International Gold Market.
 H_1 : There exists a correlation between gold prices in Indian Gold Market and International Market.
- To test the significance of seasonal variability of Gold prices in Indian Gold Market and International Gold Market. To test, it the following hypothesis has been developed:
 H_0 : Seasonal Variability of gold prices in the two gold markets is same.
 H_1 : Seasonal Variability of gold prices in the two gold markets is different.

❖ PERIOD OF STUDY

The present study is a time series study covering a period from 1991 – 2008. This period was chosen because before 1991, the Govt controlled the economy of the country. The prices were not determined by the market forces but rather fixed by the Govt. from time to time. From 1990 onwards, the Govt. of India started the process of globalization and liberalization. It allowed the companies to enter the Indian market and a number of other steps were also taken to make India an active member of the world region.

❖ SAMPLE SELECTION

The research is mainly based on secondary data, which has been collected from various RBI Bulletins, IMF publications, Govt. of India Publications and web sites of moneycontrol.com etc.

STATISTICAL TECHNIQUES USED

Different statistical techniques have been used for data presentation, analysis & interpretation of results. For data presentation, trend line graphs have been used while for analysis of data, the techniques used were measures of variation, correlation and time series analysis. For interpreting the results of hypothesis testing, student's t-test has been used.

SEASONAL VARIATION IN THE GOLD PRICES

EXHIBIT 1: Seasonal Index of Indian Gold Market by Simple Average Method (from 1991-2008)

Months/ Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total	Average
1991	3738	3538	3440	3673	3755	3731	4160	4251	4250	4665	3950	4941	48092	4007.667
1992	4835	4650	4443	4553	4127	4100	4154	4084	4121	4049	3976	3966	51058	4254.833
1993	3966	4110	4082	4623	4600	4386	4680	3902	4376	4556	4622	4637	52540	4378.333
1994	4623	4485	4629	4674	4670	4575	4635	4623	4825	4793	4739	4720	55991	4665.917
1995	4725	4660	4680	4860	4740	4740	4695	4710	4895	5028	5030	5115	57878	4823.167
1996	4787	5223	4853	4828	4812	4750	4716	4800	4880	4730	4808	4742	57929	4827.417
1997	4596	4505	4443	4483	4459	4355	4140	4199	4164	4105	3874	3713	51036	4253.00
1998	3707	3738	3700	3938	3998	4028	3835	3771	3949	4020	3946	3961	46591	3882.583
1999	4060	3954	4007	4080	4008	3803	3752	3800	3846	4412	4299	4151	48172	4014.333
2000	4179	4355	4103	4166	4870	4511	4538	4520	4515	4537	4480	4540	53314	4442.833
2001	4404	4343	4372	4340	4557	4527	4497	4577	4815	4848	4727	4709	54717	4559.758
2002	4848	5127	5109	5278	5494	5604	5445	5373	5511	5458	5489	5696	64432	5369.328
2003	6096	6108	5781	5541	5968	5929	5780	5890	6191	6131	6331	6609	72354	6029.463
2004	6702	6534	6522	6318	6187	6370	6538	6620	6662	6865	7067	6932	79317	6609.743
2005	6613	6598	6768	6698	6548	6697	6590	6813	7144	7515	7772	8317	84072	7005.999
2006	8684	8770	8836	9786	10931	9795	10513	10505	9845	9506	10049	10032	117250	9770.858
2007	9984	10476	10302	10353	9724	9545	9600	9697	10259	10648	11357	11315	123259	10271.61
2008	12502	13092	13946	13006	13417	13606	14374	12870	13518	13988	14390	10770	159481	13290.07
Total	103050.3	104265.6	104016.9	105198.43	106864.57	105049.4	106642.08	105005.49	107766.2	109853.2	110905.26	108865.5	1277483	106456.9
Average	5725.01	5792.5	5778.71	5844.35	5936.92	5836.07	5924.55	5833.63	5987.01	6102.95	6161.40	6048.08	70971.27	5914.27
Seasonal Index	96.80	97.94	97.70	98.81	100.38	98.67	100.17	98.63	101.23	103.19	104.17	102.26	1200.00	100.00

Source: www.moneycontrol.com

EXHIBIT 2: Seasonal Index of International Gold Market by Simple Average Method (from 1991-2008)

Months/ Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total	Average
1991	383.64	363.83	363.33	358.39	356.82	366.72	367.68	356.23	341.74	358.69	360.17	361.06	4338.30	361.525
1992	354.45	353.89	344.35	338.50	337.23	340.80	353.05	342.96	345.55	344.38	335.87	334.80	4125.83	343.8192
1993	329.01	329.35	330.08	342.07	367.18	371.89	392.19	378.84	355.27	364.18	373.83	383.35	4317.24	359.77
1994	386.88	381.91	384.13	377.27	381.26	385.64	385.49	380.35	391.58	389.77	384.39	379.29	4607.96	383.9969
1995	378.55	376.64	382.12	391.03	385.12	387.56	386.23	383.81	383.05	383.28	385.10	387.31	4609.80	384.15
1996	400.27	404.79	396.25	392.83	392.01	385.27	383.47	387.46	383.14	381.41	377.85	369.00	4653.75	387.8125
1997	354.11	346.58	351.81	344.47	343.97	340.76	324.10	324.01	322.82	324.87	306.04	288.74	3972.28	331.0233
1998	289.15	397.49	295.94	308.29	299.10	292.32	292.87	284.11	288.98	296.22	294.77	291.62	3630.86	302.5717
1999	387.07	287.22	285.96	282.62	276.88	361.37	256.08	256.70	366.60	310.72	293.18	283.34	3647.74	303.9783
2000	284.32	299.94	386.39	279.86	275.31	385.73	281.55	274.47	373.68	270.00	266.01	271.45	3648.71	304.0592

2001	94.78	93.48	93.90	92.99	97.23	96.33	95.51	97.24	101.18	101.05	98.59	98.48	1160.7677	96.73064
2002	100.50	105.49	104.98	108.06	112.31	114.66	111.84	110.76	113.93	113.01	113.91	118.49	1327.9368	110.6614
2003	127.40	128.15	121.58	117.16	126.98	127.22	125.30	128.43	135.28	135.27	139.20	145.28	1557.2519	129.771
2004	147.72	144.56	145.18	143.96	137.01	140.08	142.12	142.98	144.68	150.10	156.86	157.82	1753.0842	146.0904
2005	151.38	151.14	155.05	153.24	150.61	153.74	151.54	156.34	162.81	167.75	170.17	182.11	1905.8802	158.8234
2006	196.30	198.13	198.88	218.00	241.11	234.11	226.23	225.74	213.51	209.12	224.14	224.70	2609.977	217.4981
2007	225.32	237.31	233.80	242.54	238.09	234.01	237.51	237.55	254.42	269.40	287.83	286.74	2984.5164	248.7097
2008	317.58	329.26	345.73	324.76	317.91	317.55	335.50	299.28	296.29	287.96	300.08	224.82	3696.7175	308.0598
Total	4908.44	4929.17	4919.46	4816.04	4836.13	5035.75	4848.27	4767.27	4974.50	4857.20	4867.97	4788.41	58548.60	4879.05
Average	272.69	273.84	273.30	267.55	268.67	279.76	269.34	264.84	276.36	269.84	270.44	266.02	3252.70	271.05
Seasonal Index	100.60	101.02	100.82	98.70	99.12	103.21	99.36	97.70	101.95	99.55	99.77	98.14	1200	100

Source: www.moneycontrol.com

From EXHIBIT 1 & 2; it is clear that prices of gold in both the Indian market and International market do not show any seasonal affects. The values of seasonal indices in Indian market range from 97.70 to 104.17 while in the International market, the values vary from 97.70 to 103.21. So in both the markets, there is only marginal difference in the values of monthly seasonal indices, which show that no seasonality is associated with gold price movements in the two markets.

COMPARISON BETWEEN INDIAN AND INTERNATIONAL MARKET REGARDING GOLD PRICES

Before making any comparison between gold prices in Indian market and International market, it is worth mentioning that prices in Indian market are quoted in Indian rupee while in London Metal Market, prices are quoted in U.S. dollars. So for making a fruitful comparison of variability in the two markets, relative measure of dispersion, instead of absolute measures of dispersion has been used. But there are certain observations, which can be made without looking into the aspects, which are as follows:-

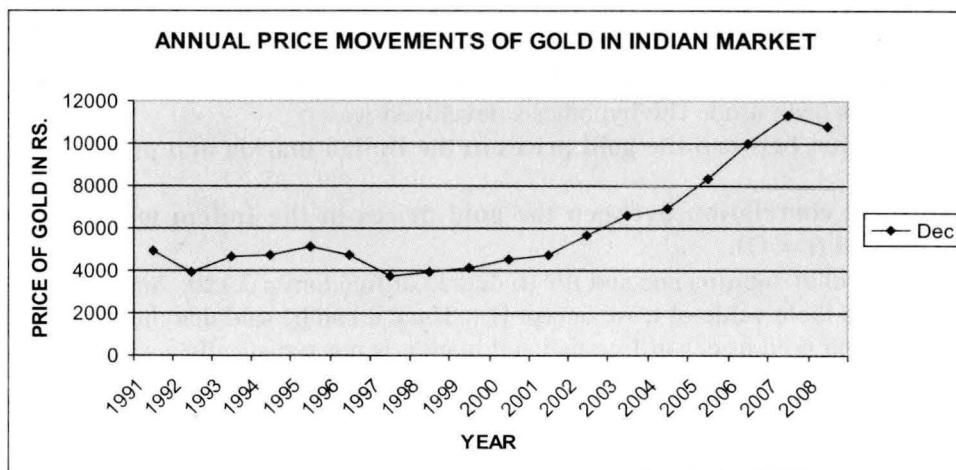
• **Trend in Price Movement:** - In Indian Market, the average annual prices of gold showed an increasing trend from the year 1991 to 1996, then showed a decreasing trend in 1997 and 1998 and again showed on increasing trend in the year 2000. On the other hand, starting from the year 1991, the prices in the international gold market declined in 1992 but showed an upward trend from 1993 to 1996; then the prices again showed a downward trend from 1997 to 1999 and finally, the prices rose again in the year 2000. From 2001 to 2008, the gold prices are continuously increasing in Indian market, but it has a fluctuating trend in the international market.

So in general, it can be said that the direction of price movements in the two markets is the same barring a couple of years. The same can be judged from the following graph:-

• **Correlation between prices in the two markets:** - For further analysis of the relationship between gold prices in Indian and International markets, Karl Pearson coefficient of correlation is calculated between gold prices in Indian market and the international market.

Figure 1:

ANNUAL PRICE MOVEMENTS OF GOLD IN INDIAN & INTERNATIONAL MARKETS



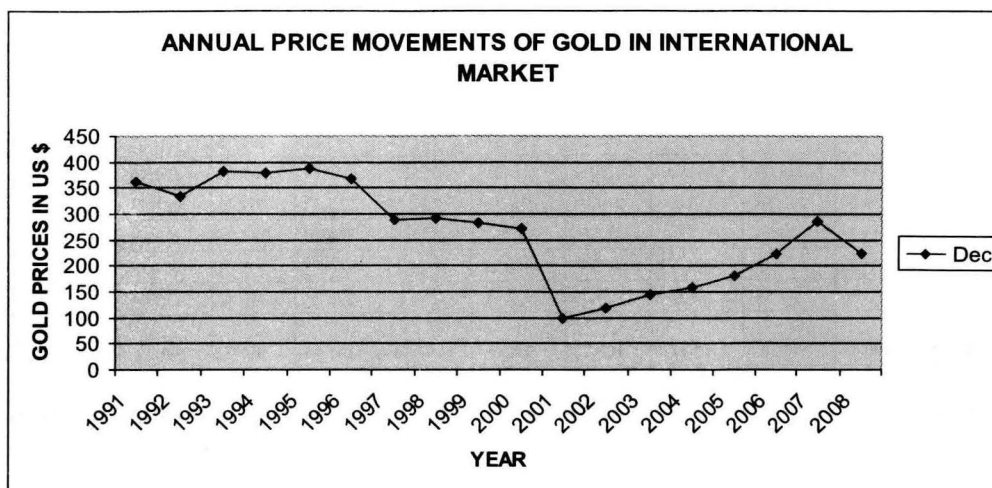


EXHIBIT: 3 Co-Efficient Of Correlation Between Gold Prices In Indian Market And International Market

Year	X	Y	X ²	Y ²	XY
1991	4007.60	361.53	16060858	130700.3	1448848
1992	4254.83	343.81	18103578	118205.3	1462853
1993	4378.33	359.77	19169774	129434.5	1575192
1994	4665.91	383.99	21770716	147448.3	1791663
1995	4823.16	384.15	23262872	147571.2	1852817
1996	4827.48	387.80	23304563	150388.8	1872097
1997	4253.00	331.04	18088009	109587.5	1407913
1998	3882.50	298.98	15073806	89389.04	1160790
1999	4014.33	327.03	16114845	106948.6	1312806
2000	4442.83	304.05	19738738	92446.4	1350842
2001	4559.76	96.73	20791394	9356.816	441068.3
2002	5369.33	110.66	28829688	12245.95	594177.4
2003	6029.46	129.77	36354422	16840.51	782449.3
2004	6609.74	146.09	43688708	21342.39	965619.7
2005	7006.00	158.82	49084024	25224.86	1112716
2006	9770.86	217.50	95469671	47305.42	2125143
2007	10271.61	248.71	105505953	61856.52	2554649
2008	13290.07	308.06	176626070	94900.84	4094137
Total	106456.80	4898.49	1.133E+10	23995197	5.21E+08

Gold prices in Indian market (Rs / 10gms) – X

Gold prices in International market (\$ / oz) – Y

The value of r was found to be **-0.23**. To test whether this value of r shows a significant relationship between two prices, Student's t-test has been used. The hypothesis developed was:

H₀: There is no correlation between the gold prices in the Indian market and prices in the International Market (r = 0).

H₁: There is significant correlation between the gold prices in the Indian market and prices in the International market (r ≠ 0).

Table value of t at 5% level of significance and for 16 degree of freedom = 2.120. Since the calculated value of t (-0.9453) is less than the table value of t, we accept H₀. Thus, it can be said that the correlation between gold prices in Indian market and gold prices in International market is not statistically significant.

• Changes In Foreign Exchange Rate and Gold Prices Movements

In the discussion above, value of Karl Pearson Coefficient of Correlation was calculated between gold prices in Indian market and International market. Value of 'r' was found to be **-0.23**, which is statistically not significant.

To find whether changes in exchange rates of Indian rupee vis a vis US dollar also affected the gold prices in the two markets, value of Karl Pearson coefficient was calculated between (1) Exchange rates and prices in Indian gold prices and (2) Exchange rates and prices in International gold market.

EXHIBIT 4: Impact of Changes in Foreign Exchange Rates on Gold Prices

Year	Average Prices in Indian Market (Rs/10gm)	Average Prices in London Market (\$/oz)	Average Exchange Rate*
1991	4007.60	361.53	24.16
1992	4254.83	343.81	31.37
1993	4378.33	359.77	31.38
1994	4665.91	383.99	32.13
1995	4823.16	384.15	35.37
1996	4827.48	387.80	36.05
1997	4253.00	331.04	41.01
1998	3882.50	298.98	42.99
1999	4014.33	327.03	44.67
2000	4442.83	304.05	47.12
2001	4559.76	96.73	48.66
2002	5369.33	110.66	46.88
2003	6029.46	129.77	45.48
2004	6609.74	146.09	43.97
2005	7006.00	158.82	45.41
2006	9770.86	217.50	41.79
2007	10271.61	248.71	42.95
2008	13290.07	308.06	49.71

* http://www.oanda.com/convert/fxaverage_result

Value of 'r' between gold prices in Indian market and exchange rate was found to be 0.42057, which is statistically significant. It means that changes in gold prices in Indian gold market are not independent of changes in exchange rate of Indian rupee vis-à-vis US dollar. Further, the value of 'r' between gold prices in international market and exchange rate was found to be -0.66882, which is statistically not significant. It shows that changes in exchange rate significantly affect the gold price changes in international market. Though there might be other factors also which effect the gold price movements in international market, but changes in international exchange rate is also a major factor.

CONCLUSION

It can be concluded that in international markets, exchange rate might be the most important factor. When rates in general decrease and gold prices increase, people may go for gold purchases in case of currency depreciation. But in the Indian gold market, exchange rate variation has an effect on price. Here the prices are dependent mainly on prices in international gold market and then the exchange rate. No definite increasing or decreasing trend was observed regarding variation in monthly average gold prices during a year for both the Indian gold market & International Market. Variations in annual average gold prices showed, in general, an increasing trend in the Indian Gold market for all but two years (1997 and 1998) but in case of the international gold market, this trend was less visible as of the total period undertaken for increasing trend was 5 while the years 1992, 1997, 1998 and 1999 showed a decreasing trend. After 2001, it shows an increasing trend. If monthly variations are considered, Indian gold market has greater variability than the International gold market. While taking into account the yearly variations in gold prices in the two markets, it was found that the Indian gold market has lesser variability than the International gold market.

SUGGESTIONS

Gold Policy should be reviewed because of the following reasons: -

- (a) We should not waste scarce foreign exchange on unproductive purposes. The recent liberalization of imports through NRI and SIL route has shown that in reality, there is no adverse impact on liberalized gold import.
- (b) Import on use of gold should be discouraged since it affects domestic savings adversely and implies diversion of resources for unproductive purposes.

(Contd. on page 46)